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MOTION GRAPHICS AS AN EDUCATIONAL TOOL THAT SUPPORTS LEARNING ENGLISH VOCABULARY BY CHINESE STUDENTS

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Abstract

Motion graphics are a valuable tool for enhancing English vocabulary learning in primary schools, possessing the potential to increase student engagement and clarify concepts. However, a significant gap exists between their pedagogical potential and practical application. Existing implementations result in superficial content digitisation, encourage passive viewing, and cause cognitive overload. While existing research demonstrates the positive learning effects of motion graphics, there is a dearth of specific design guidelines to help practitioners overcome these challenges. Focusing on the context of Grade 2 English vocabulary instruction in Chinese primary schools, this study seeks to answer the question: How can motion graphics as an educational tool be designed to support English vocabulary learning for Chinese primary school children in a classroom setting?

Adopting Educational Design Research as its overarching framework, this research employs qualitative methods, including semi-structured in-depth interviews and visual analysis, through a three-phase methodology of contextual inquiry, iterative design, and expert evaluation. The research yields three key findings: 1) it reveals a core ‘reconciliation paradox’, a tension between designing for cognitive efficiency, which requires simplicity, and for learning motivation, which thrives on novelty; 2) it uncovers a dual challenge in visual expression: the need to effectively connect abstract symbols with concrete understanding for students, and the finding that this connection collapses when the content is culturally inappropriate, thereby increasing cognitive load; 3) it finds that extraneous cognitive load arises not just from on-screen design, but from a lack of visual coherence across media, between the digital interface, the physical environment, and paper-based materials.

This research culminates in three corresponding core design frameworks: 1) a Dynamic Regulatory Model proposes a method to address the paradox, guiding designers to make strategic decisions on both macro-level timing and micro-level design; 2) a framework for Constructing Effective Instructional Visual Expression advocates for synergistic decision-making, matching representational modes (abstract vs. concrete) with pedagogical goals while ensuring content is culturally and experientially relevant. 3) a cross-media ‘Visual Grammar’ for Reducing Cognitive Load expands the concept of clarity from a static on-screen issue to a dynamic, structural system of cues that creates a coherent learning path.

This research contributes an evidence-rooted, context-driven set of design guidelines deeply embedded in the realities of Chinese primary school classrooms. It fills the gap between educational theory and design practice by translating abstract teaching needs into actionable strategies. The guidelines empower designers to create more pedagogically effective motion graphics.

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Finally, I would like to dedicate this work to the memory of my beloved grandfather. I hope this achievement makes you proud.

Author’s declaration

I hereby declare that this thesis is my own work and has not been submitted in substantially the same form for the award of a higher degree at any other institution.

Any sections of the thesis which have been published, or submitted for a higher degree elsewhere, have been clearly identified.

Where this thesis is the result of joint research, I confirm that the work contained herein represents my individual contribution, as verified by my supervisor(s).

Chapter 1 | Introduction

1.1 Introduction

The success of early education depends on the teacher's instruction, the integration of modern technology, and the variety of teaching activities (Hapsari and Hanif, 2019). Information and Communication Technology (ICT) is now widely incorporated into various educational approaches (Hlasna et al., 2017). With the aid of ICT-based educational tools, students are more likely to engage in interactive, enjoyable, and experiential learning activities (Anikina and Yakimenko, 2015). To create a more engaging learning environment, visual displays are commonly used, as they are effective in maintaining students' attention (Naylor and Keogh, 2000).

Since ICT has the potential to enhance the effectiveness of teaching and learning (Gellerstedt et al., 2018, Eckhaus and Davidovitch, 2019), new media is increasingly used in education as a teaching aid. It integrates various elements such as text, audio, graphics, and images to create a systematic and interactive teaching process. As an auxiliary ICT-based educational tool, Video-Based Learning (VBL) is widely applied in formal classroom settings (Mitrovic et al., 2017). Motion graphics learning, a complex type of VBL (Indrawati et al., 2021), is extensively used in classrooms, while motion graphics serve as an engaging, stimulating, informative, and entertaining teaching tool. It encourages active participation and enhances English language learning, ultimately improving students' learning performance (Indrawati et al., 2021). Motion graphics as an instructional tool have also proven effective in assisting teachers in achieving learning goals (Syaha and Harsono, 2020). Different teaching activities now incorporate motion graphics in different forms, including classroom-based and online learning.

In the specific context of Chinese primary school classrooms, the application of motion graphics (as one of the multi-media in ICT tools) demonstrates significant advantages: 1) creates vivid teaching contexts, stimulates students' interest in learning, and enhances classroom engagement and interactivity; 2) supports the fast-paced and large-volume presentation of information, thereby expanding students' knowledge acquisition. Moreover, the use of visual elements such as images and animations effectively reduces the cognitive difficulty of understanding information and promotes the development of students' thinking abilities. The richness of teaching resources not only increases the classroom's capacity to incorporate instructional content but also reduces teachers' preparation workload, optimising both the teaching process and overall efficiency. Motion graphics also build an effective connection of communication between teachers and students, enhancing classroom participation and dynamism, while facilitating organised and systematic review, ultimately improving the overall quality of instruction (Dai Shuxiang, 2020; Bai Yonghe, 2019; Yin Chengyou and Wang Jinmei, 2020; Li Hanghang and He Yanwen, 2020; Zhang Hailong, 2019; He Xiang, 2018, Wang Yuxin et al., 2021, Zhang Guoping, 2021, Fan Liling, 2021, Huang Cuiping, 2019).

Despite the advantages that motion graphics offer in Chinese primary school classrooms, a series of issues and challenges persist in practical application:

A prominent contradiction lies in the relationship between technological advancement and teachers' professional skills. Motion graphics are increasingly diverse and sophisticated, while teachers lack the competence to effectively design and utilise motion graphics. As a result, the content merely replicates textbook material without deep processing, and in some cases, is less comprehensive than the textbook (Zhang Qiang, 2019). Teachers rely on mechanically displaying pre-designed teaching materials during class and are often unable to respond flexibly to spontaneous teaching situations. This leads to a formalised teaching process in which the teacher's role is reduced to that of a 'teaching material presenter', significantly undermining instructional effectiveness. There is also a notable divergence between motion graphics use and instructional objectives. Teaching materials often feature limited interactivity and prioritise form over substance, causing the learning goals to become vague or even deviate from the core curriculum (Chen Yufeng, 2019). During the use of motion graphics, teachers frequently focus on technical presentation while neglecting real-time interaction with students, which reduces teacher-

student engagement to a superficial level and shifts students from ‘active learners’ to ‘passive recipients’ (Liu Meixia, 2019). The integration of information technology with traditional pedagogical strengths remains insufficient, leading to classrooms characterised by unclear instructional focus and overly procedural teaching processes (Jin Yuyan, 2020; Ma Chungui, 2019).

Moreover, there is a disconnect between classroom content and visual presentation. Teachers and motion graphics producers fall into the misconception of overemphasising visual appeal to attract student interest. This comes at the cost of content depth and the logical structure of the curriculum, rendering the use of technology superficial and depriving educational informatisation of its intended value (Tang Guangjiang, 2023). In addition, as motion graphics used as teaching materials become faster-paced and denser, students are subjected to greater cognitive demands, potentially resulting in visual fatigue and cognitive overload. This, in turn, hinders their ability to grasp key concepts and critical points, thereby impairing deeper understanding (Zhang Qiang, 2019).

Overall, teaching with motion graphics at the primary education level has challenges: teachers’ limited familiarity with motion graphics; misalignment between motion graphics design and cognitive principles; disconnection in the instructional process; and the fragmentation between technology and pedagogical goals.

Since motion graphics, as a teaching tool, have been shown to have a positive impact on classroom instruction, yet still have practical challenges, a critical research question emerges:

> ***How should motion graphics be designed to effectively support classroom education?***

Most existing studies on the relationship between motion graphics and learning effectiveness focus primarily on demonstrating the positive effects of motion graphics through controlled experiments (Hanif, 2020, Amali et al., 2020, Hapsari and Hanif, 2019, Islam et al., 2014, Morrison et al., 2000). The mutual influence between motion graphics design and education is also widely acknowledged (Hanif, 2020, Elshanawany, 2019, Silfia et al., 2018, Amali et al., 2020, Hapsari and Hanif, 2019, Perdani, 2024). However, there remains limited research addressing the question of how motion graphics should be designed

in a way that directly responds to specific classroom needs and pedagogical challenges, thereby providing more targeted and effective instructional support.

According to *Compulsory Education Curriculum Programme (2022 Edition)* in China: ‘English language learning programmer are offered at the primary school level, starting at Grade 3, and in areas and schools with the capacity to do so, in Grades 1 and 2, with a focus on listening and speaking.’ However, learning English presents challenges for Chinese students. According to Song Hong (2025), distraction is a common phenomenon in today’s primary school classrooms. The reasons include: teachers’ reliance on traditional ‘didactic’ teaching methods that fail to stimulate student interest; noisy learning environments that make it difficult for students to maintain attention; monotonous classroom activities that lack diversity and interaction, leading to low student participation; and the disconnection between classroom activities and students’ daily lives, which prevents students from resonating with the content and results in reduced attention. Consequently, classroom activities require a wide variety of interactive teaching materials to maintain engagement (Yildirim and Torun, 2014). Compared to other core subjects, English instruction is often designed to be more engaging and interactive, frequently incorporating teaching materials that feature motion graphics.

Therein, vocabulary plays a fundamental role in language acquisition, serving as the foundation for listening, speaking, reading, and writing (Schmitt et al., 2001). It is commonly taught using visual methods that connect a word’s meaning with its spelling, a technique commonly referred to as ‘visual word’ instruction. This method provides a more intuitive learning experience, as comprehension through visual representation is one of the most effective ways for students to acquire new knowledge (Ware, 2019). As such, vocabulary instruction is highly relevant to the use of motion graphics as a teaching tool, given its strong capacity for visual expression.

This research focuses on English vocabulary learning in Chinese primary schools to explore how motion graphics can be effectively designed to support pedagogical practices. By integrating insights from educational theory, design theory, and classroom practice, this study aims to develop evidence-based guidelines for motion graphics design for education.

1.2 Motion graphics

The phrase ‘motion graphics’ appeared in the video editing industry in the 1950s, up to now, there is still no authoritative interpretation of its meaning (Chen Yang, 2018). According to Shaw (2015), motion graphics is derived from the combination of graphics media and motion media. Motion graphics can be interpreted as graphics in movement (Geng, 2016), ‘moving pictures’ can be the most immediate and basic meaning of motion graphics (Gong Guannan, 2016). Motion graphics also refer to the ‘moving figure’, which changes shape over time, a dynamic expression of the graph (Song, 2021). As described by Bursak (2018), the core concept of motion graphics is the result of recording the motion of graphics in space and time. Xu Yibing and Xu Xiaoxiao (2013) propose the formula for motion graphics as ‘Motion Graphics = Graphic + Motion + Time’, which emphasises that motion graphics must contain these three dimensions. In terms of dynamic graphics, the classic graphics design theory still plays the target-oriented and guiding role, therefore, motion graphics becomes a visual symbol that is based on graphics design and made of dynamic images (Han Jun and Wang Xuchen, 2021). Motion graphics design is archiving graphics design with dynamic expression (Jahanlou et al., 2020).

However, the general perceptions of ‘motion graphics’ observed across studies tend to be similar, even if they differ in terms of specific media categories or representative formats. But at the same time, the definition remains subject to debate. A detailed discussion of these varying perspectives will be presented in Chapter 2. In Chapter 6, a context-specific definition of motion graphics, informed by insights from practicing teachers, will be proposed for the purposes of this research.

1.3 The positive impact of motion graphics on education

Information and communication technologies (ICT) continuously transform how knowledge is conceived and delivered (Assar, 2015) and are now ubiquitous in teaching activities (Hlasna et al., 2017). In modern student-centred learning paradigms (Hanif, 2020), education is shifting toward more interactive and experiential approaches (Anikina and Yakimenko, 2015). Accordingly, the teacher's role is redefined, requiring them to foster students' interest and motivation (Yakovleva and Goltsova, 2016) and to integrate ICT through appropriate pedagogical strategies (Hanif, 2020). Mastering this integration is a crucial skill for educators adapting to evolving learning paradigms (Gellerstedt et al., 2018, El Shaban and Egbert, 2018). Effective use of ICT can facilitate engaging and experiential learning (Anikina and Yakimenko, 2015), and the choice of instructional media and activities is critical for successful primary school education (Hapsari and Hanif, 2019).

Media as an instructional tool has been found to improve learning outcomes compared to conventional teaching (Lata and Pooja, 2015) and enhances student engagement (Leow and Neo, 2014). Haque et al. (2016) find that although digital and traditional methods show similar efficiency, digital learning more effectively promotes students' understanding and application of knowledge. It also increases learners' satisfaction (Klentien and Kamnungwut, 2015) and motivation (Lin et al., 2017).

Video is widely used in teaching as an engaging and informative medium (Perdani, 2024) and remains in high demand (Perdani, 2022). Video-Based Learning (VBL) refers to educational video content that teachers can create or use as instructional resources (Perdani, 2024). Its popularity stems from its ability to capture students' interest. Students particularly enjoy animations and cartoons, which make learning enjoyable and reduce monotony (Hanif, 2020, Naylor and Keogh, 2000, Naylor and Keogh, 2013). VBL also helps teachers explain complex content and supports the teaching process (Pricahyo et al., 2018, Perdani, 2024). Moreover, it fosters motivation, enthusiasm, creativity, and active classroom participation (Perdani, 2024, Sukmanasa et al., 2019).

Motion graphics learning, as a form of Video-Based Learning (VBL), is increasingly used in education (Perdani, 2022). By presenting content dynamically, it creates visually engaging and interactive learning experiences, which have been shown to be effective (Yahya, 2019, Hapsari and Hanif, 2019,

Pricahyo et al., 2018). As a tool for visual communication, motion graphics both conveys information and entertains, thereby enhancing engagement (Larsari and Wildová, 2020). Visually appealing features in learning media are crucial in supporting the teaching process (Adnan et al., 2017), as they capture attention, sustain motivation, and prevent boredom (Wiana et al., 2018, Romadonah and Maharani, 2019). Moreover, motion graphics provide interactive, enjoyable, and accessible learning experiences (Setiadi et al., 2021), encouraging students to participate more actively (Hapsari and Hanif, 2019). Overall, motion graphics significantly improve student learning outcomes (Perdani, 2022) and are more effective than traditional teaching methods (Hapsari and Hanif, 2019).

Although in most cases motion graphics have a positive impact on teaching and learning, some motion graphics can also have a negative impact on learning. As mentioned by Lee and Shin (2012), excessive use of animation can have a detrimental effect on learning. In some cases, static graphic representations can be superior to dynamic graphics, which can contain more detail and become difficult to understand (Khorsandi et al., 2022). Côté-Arsenault and Morrison-Beedy (1999) et al. suggest that motion graphics need to be well-designed as well as easy to understand in order to be useful for learning. The media used needs to be matched with the characteristics of the students, which in turn is more conducive to the students' understanding of the content presented in the video media (Hapsari and Hanif, 2019).

1.4 Existing studies and research gap

Existing studies have demonstrated and emphasised the positive impact of motion graphics across various instructional contexts. Multiple factors contribute to this influence, with student engagement identified as key drivers. However, there is limited information regarding practical design strategies, particularly in the specific context of using motion graphics in primary school English vocabulary classrooms. A detailed discussion of this issue is presented in Chapter 4.

According to practice teachers, there is indeed a strong demand in developing motion graphics that closely align with their instructional needs. However, due to a lack of technical skills or access to necessary resources, teachers find it difficult to realise personalised instructional design. In addition, as non-professional designers, teachers have challenges in modifying and optimising

existing motion graphics, even though they are eager to enhance classroom engagement by improving the quality of their teaching materials. Regarding the design aspect, although designers possess professional expertise, they lack clear guidelines and practical demand insights specific to motion graphics design in English vocabulary teaching. As a result, they struggle to make design decisions that closely align with classroom contexts. Current studies lack systematic strategies to guide how educational usage impacts motion visual design in order to serve pedagogical goals.

Therefore, this research argues that motion graphics used in practical classroom settings are influenced by practice needs, usage contexts, corresponding design principles, and educational theories. An integrated discussion of these factors is essential to develop effective design guidelines.

1.5 Research context

The research site is selected as a primary school located in Guangzhou, a city in China. This choice is based on two main considerations.

- First, from a methodological perspective, the researcher possesses deep insider knowledge of the local educational culture, curriculum practices. This familiarity ensures the ecological validity of the research design and the feasibility of data collection.

- Second, from a representational perspective, Guangzhou stands at the forefront of educational development in China. Its primary school English education starts earlier and benefits from better resource investment (Guangzhou Municipal Education Bureau, 2022). This makes it an appropriate site to research the application of advanced teaching tools, such as motion graphics, within a highly urbanised and digitally integrated educational setting. Consequently, the research findings have reference value and transferability to other similarly urbanised regions in China.

The core focus of this research is on Grade 2 teachers and students (aged 7–8). This decision is made after a comprehensive consideration of curriculum standards, student developmental stages, and teaching practice. According to the *Compulsory Education's English Curriculum Standards (2022 Edition)*,

developed by the Ministry of Education of the People's Republic of China, Grades 1 and 2 belong to the Preparatory Level of English learning. At this stage, the core teaching objective is not systematic knowledge accumulation, but rather to 'encourage active engagement in language learning and practice.'

The choice of Grade 2 over other grades is based on the following reasons:

- **More suitable starting point for intervention than Grade 1.**
  Grade 1 is essentially the 'exposure stage' of English learning, where the primary task is to become familiar with the language and build basic perceptual awareness. By Grade 2, students have developed basic learning subject consciousness, and the curriculum shifts from mere exposure to more purposeful recognition and comprehension of core vocabulary. This provides clear teaching objectives and practical usage for motion graphics design focused on vocabulary instruction.

- **More obvious intervention effect than in Grade 3 and above.**
  According to the curriculum's staged progression, Grade 3 marks the beginning of Level 1, with a noticeable increase in content difficulty and systematic requirements. Importantly, most schools introduce more formal written examinations from Grade 3. This tends to change teaching approaches, with student motivation driven by assessment goals. In contrast, Grade 2 classrooms remain relatively pressure-free, with a stronger emphasis on enjoyment and participation. Students' learning behaviour is still largely driven by curiosity and interest, creating an optimal environment for researching the impact of motion graphics without interference from examination-related pressures. This choice was further confirmed by the experienced teachers participating in this research.

In conclusion, Grade 2 classrooms in Guangzhou provide an optimal research context: they align with the new curriculum's emphasis on fostering interest among lower-grade students, and with the starting point of systematic vocabulary learning, minimising the effects of exam-oriented pressures in higher grades. This selection of research context, therefore, offers maximised situational support for addressing the core research questions.

1.6 Research aim

This research aims to develop a set of design guidelines on motion graphics, which can effectively support the teaching and learning of English in classroom education. The design guidelines mainly attempt to provide design advice to professional motion graphics designers, which are based on the principles of motion graphics application in pedagogy theory and the practical study of education in the classroom setting. The core question of this study is therefore raised:

> ***How motion graphics as an educational tool can be designed to support English vocabulary learning for Chinese primary school children in a classroom setting?***

1.7 Research questions and objectives

To answer this core question, this research proposes the following research sub-questions and corresponding objectives, which will be explored in subsequent chapters:

1. ***What is the definition of motion graphics in this research?***
   To identify the specific definition of motion graphics in this research by combining the academic definitions with the teacher's understanding.

2. ***How do teachers and students interact with motion graphics in the classroom as an educational tool?***
   To investigate the interaction between motion graphics and the class participants in the classroom education setting.

3. ***What do students and teachers assess about educational tools which incorporate motion graphics?***
   To investigate the motivation behind the method/behaviour of teachers using motion graphics in the classroom.
   To inquiry subjective design requirements/ideas from the teachers for the motion graphics.
   To investigate students' reactions for different motion graphics.

4. ***What design guidelines can inform the design of motion graphics to support the English classroom education?***
   To construct possible design guidelines and evaluate corresponding design prototypes.
   To establish design guidelines with practical utility.

1.8 Structure of thesis

The following provides an outline of the subsequent chapters, aiming to provide a clear roadmap of the research process and the construction of the argument.

Chapter 2 aims to establish a preliminary theoretical foundation for the core concept of motion graphics in this research. By reviewing existing academic literature, this chapter outlines the diversified definitions and interpretations of motion graphics from different disciplinary perspectives. The purpose is to construct an analytical framework, which will serve as the theoretical basis for understanding and analysing, in subsequent chapters, the specific manifestations and core attributes of motion graphics as a teaching tool within the particular context of Chinese primary school classrooms.

Chapter 3 is devoted to depicting the specific teaching context in which this research takes place. Through an exploration of existing pedagogical research and practical strategies, this chapter presents the current status and objectives of English vocabulary teaching in Chinese primary schools. Its core function is to provide a concrete description of the educational context and the relevant pedagogical theories, ensuring that the subsequent design and discussion of motion graphics are closely aligned with the authentic instructional needs and constraints.

Chapter 4 focuses on the literature review. Building upon the discussions in the previous two chapters regarding the theoretical perspectives of motion graphics and the practical context of vocabulary teaching, this chapter critically evaluates existing studies directly related to both areas. Its purpose is to demonstrate that, although the academic community has acknowledged the positive potential of motion graphics as a teaching tool, there remains a research gap concerning how to specifically design motion graphics to effectively support vocabulary teaching. Consequently, this chapter provides a solid academic rationale for the overall research objectives of this thesis.

Chapter 5 states the methodological framework of this study. As Pragmatism is the philosophical foundation, this research adopts a qualitative approach, which is deemed the most suitable method to address the research questions. This chapter provides a thorough explanation of the data collection methods employed throughout the research, are the iterative data analysis process, ensuring methodological rigour and credibility for the subsequent chapters.

Chapter 6 reports the results of the first phase of data collection and analysis. Its core objective is to begin addressing the research questions by examining the specific manifestations of motion graphics in real classroom contexts. The content includes: 1) analysing teachers' existing perceptions, usage patterns, and design needs for motion graphics through interviews; 2) conducting visual analysis to deconstruct the design status of existing teaching materials. Ultimately, this chapter synthesises the data with the theoretical framework established in Chapters 2 and 3 to extract a set of initial design insights that will guide the subsequent prototype development.

Chapter 7 is the core empirical chapter of this research, providing a detailed report of the iterative test process. Building on the initial insights gained in Chapter 6, this chapter demonstrates how the prototype designs are developed, tested in real classroom settings, refined through feedback collection, and then re-entered into the subsequent process of design and testing. This process represents not only the iteration of the product itself but also the continuous evolution and refinement of the underlying design guidelines. The iterative test concludes when new feedback no longer produces substantive design changes.

Chapter 8 presents the process of constructing, validating, and refining the design guidelines. This chapter first systematically develops the initial set of design guidelines based on the comprehensive findings from the preceding research phase. Subsequently, it documents the critical process of expert validation through interviews with professional designers. Analysis at this stage focuses on assessing innovation and gathering key insights regarding optimal presentation and structure. The concluding section demonstrates the approach of refinement, showing how expert insights ultimately transform a series of research findings into a tangible, actionable design practice tool.

Chapter 9 is the core part that contributes to the research. It attempts to go beyond a simple retelling of the findings and, instead, with a holistic perspective, find deeply into the 'Why' behind the 'What' that ultimately forms the design guidelines during the iterative process of design insights throughout the entire research. This chapter aims to elevate those design decisions that have been proven effective in practical tests from specific design 'strategies' to design 'principles' that designers need to thoughtfully consider. It further discusses the theoretical implications behind these guidelines and the critical considerations designers must address when applying them.

Chapter 10 presents the practical outcomes of the research. It translates the theoretically elevated design considerations from Chapter 9 into a clear, actionable set of design guidelines aimed at practitioners. These guidelines are organised and presented to provide designers with direct, evidence-based, and practical references.

Chapter 11 provides a comprehensive review and summary of the entire research journey. It restates the core arguments of the dissertation and clearly articulates the specific contributions this research makes to the related fields in terms of theory, methodology, and practice. Additionally, this chapter adopts a critical and reflective stance to discuss the limitations of the research and based on these limitations, offers concrete recommendations for future studies.

Chapter 2 | Design of motion graphics

2.1 Introduction

Chapter 2 explores the concept of **motion graphics** and defines its design scope through a conceptual matrix. It first reviews the development of motion graphics to provide historical context for its evolution and media traits. Based on existing studies, it identifies core features such as the integration of ‘motion’ and ‘graphics’, basic attributes and functions, and a possible conceptual framework.

The chapter then examines how motion graphics relate to other visual media (animation, stop-motion, GIFs, and film), highlighting overlaps and differences in visual language, expression, and design methods. It goes on to outline current design approaches, covering graphic, motion, and time design, as well as practical design processes and methods, aiming to clarify ‘motion graphics’ from multiple perspectives.

Finally, the chapter offers a preliminary definition and application direction for motion graphics, laying a precise scope for researching its educational use. In Chapter 6, the study combines teachers’ understanding and feedback to build a context-specific definition of motion graphics.

2.2 Brief history of motion graphics

Based on Krasner (2013)'s book, *Motion Graphics Design: Applied History and Aesthetics*, the following is a brief description of the history of motion graphics:

Since the 1960s, the progress of science and technology has brought great influence on animators and motion graphics designers. The Whitney brothers experiment with the connection between music creation and abstract animation, attempting to use computer technology as a viable artistic medium.

John Whitney started creating Motion pictures and dynamic title sequences in the 1950s and founded a design company called Motion Graphics. The American graphic designer Saul Bass is considered as the most influential designer pioneering the use of moving graphics applied to film titles, he collaborated with Whitney to design the title sequence for a series of Alfred Hitchcock's films (Figure 1), such as Vertigo (1958), Anatomy of a Murder (1959), Psycho (1960). The opening of Vertigo run for 2 minutes and 58 seconds, Whitney made a bold use of circles, ovals and dynamic curves in the graphics design. John Whitney's breakthrough combination of dynamic graphic and film has officially pushed the dynamic graphic to the commercial ranks, and his success has pointed out the direction of the development of motion graphics.



Figure 1: Title sequence in Vertigo

Titles sequences are widely used in films, it is considered to be an art form that plays an important role in the visual creation of films. Advances in production

technology in the 1970s, such as motion control and optical effects, led the art of cinematography to a new level. Classic works at that time include Superman (1978), Alien (1979) and The Untouchables (1978). By the late 1990s, influenced by Saul Bass and Pablo Ferro, Kyle Cooper applies the techniques of design and printing into motion graphics design, combining traditional printing skills with new digital techniques. His representative works are the opening title he designed for David Fincher's 1995 film: Se7en (Figure 2). Therefore, he is deemed to be one of the designers who brought the wildest influence in motion graphics design.



Figure 2: Title sequence in Se7en

In the 20 years from 1960 to 1980, black and white television is gradually phased out and colour television became mainstream. Since then, with the popularity of television and the exploding development of the television industry, there is an increasing demand for screen images creation. However, the motion design at that time is mostly used in fulfilling the visual effect demand of broadcast TV programs. In the 1980s, Quantel Paintbox as a landmark platform for TV production of dynamic graphics at that time, was mainly applied to the production of music videos and advertising because the cost of producing motion graphics is very high at that time. Designers can only work on the company's equipment, resulting in a lack of creativity. Cable TV invests in the equipment to produce dynamic graphics to improve its competitiveness with network TV. The three major cable TV networks in The United States: ABC, CBS and NBC, begin to apply dynamic graphics design in their programs. At that time, motion graphics simply displayed dynamic patterns on the screen, which is more like a product of corporate culture than an expression of creativity and inspiration.

Because of the increasing popularity of cable TV, MTV becomes a mainstream element of television programming. It enables animators, graffiti artists, and video artists to explore a new medium using animated visual effects. In addition to the popularity of cable television, video games and videotapes create additional demand for motion graphics. With the development of video games, the demand for motion graphics increased. The independent filmmakers, entertainers and businessmen started to release movies and games, leading designers to create more different kinds of motion graphics for the new products. In the 1990s, the spread of computers and the emergence of desktop video systems revolutionised the production process. The emergence of different design software, such as Flash, Dream Weaver, and After Effects, made it easier for designers to make motion graphics.

In the 21st century, because of the rapid development of the Internet and computer technology, as well as the rapid popularisation of digital video technology, it has become easier to produce dynamic graphics and animation. In the background of the we-media (i.e., a form of communication in which individuals or small groups independently produce and disseminate content using digital platforms) era, many dynamic graphic animators choose to create independently. Until now, the creation of motion graphics has no longer been dominated by design companies. More independent designers appear on social networks. They display their works on various social platforms and complete the operation of their works independently.

2.3 Characteristic of motion graphics

2.3.1 Motion and graphic

Motion media represents that the subjects change with time, which contains different disciplines, such as animation, film, and sound. It is a product of the development of science and technology, which is regarded as a new way of expression (Li Na and Zhang Xiaolin, 2019). When designing motion media, it is referred to as **motion design**, which can provide creators or designers with the opportunity to play with qualities of rhythm and tension.

Graphics media represent subjects that do not change over time, such as static graphics, illustration, photography and painting (Shaw, 2015). Its basic definition can be interpreted as an explanatory graphic produced by writing,

drawing, engraving, and printing. Graphic media can be functional or artistic. It can be a functional communication tool. Like text, language. These tools are endowed with a certain amount of information and created to convey that information. It can also be created by artists with the main purpose of aesthetic expression, which may reflect the social status or daily life, based on the artist's artistic ideas (Yu Bowen, 2021).

2.3.2 Graphic into motion

In terms of the classic graphics language, it is expressed in static and two-dimensional patterns. Due to the changes in technology and people's aesthetic consciousness, these graphic languages are turned into dynamic and multidimensional forms of expression and gradually become the trend of information transmission.

Dynamic graphics language is developed based on static graphics, and the theory of graphics design has become the theoretical basis of dynamic graphic design. With this basis, designers apply digital technology to create dynamic graphics to display in multimedia and spread information. Compared with static visual language, dynamic graphics has expanded dimension in both time and space, developing from unitary to diversified. Once a static graph or image defines space, depth, and a focal point, then these separate static figures are placed on a timeline as a frame and become a certain key point in sequence, a motion design project is formed (Shaw, 2015). The key to the dynamic of graphic language is the addition of time dimension, which is the essential difference between static graphic language and dynamic graphics. From the perspective of creators and designers, dynamic graphics allow designers to design 'the time', that is, a deductive arrangement of the pattern change process. Designers change the motion form of static pattern language through deceleration, stillness, circulation, inversion, frame extraction.

2.3.3 Features of motion graphics

Regarding the features of motion graphics, based on Gong Guannan (2016)'s categorisation, the following provides corresponding explanations.

Moving graphics. Since the time dimension is involved in motion graphics, the design of motion graphics is not only formed by a single picture.

Abstraction of graphics. Matt Frantz defines motion graphics as a 'non-narrative, non-figurative visual design based on changes in time'. In this context, graphics refers to 'visuals that are clear and detailed'. From the information transmission perspective, motion graphics dynamically present information, using symbolic and abstract figures to highlight key features and form easily recognisable visuals, thereby enhancing clarity.

Stronger visual attention. Visual information analysis is a basic function in the human cognitive system, the processing of visual information is more frequent than others (Ware, 2019) , it can be processed efficiently by people's visual system instead of requiring attentive effort (Woods, 1991, Healey et al., 1995). According to Neisser (2014), what audiences see depends on how they focus their attention, shaped by their expectations and perception. Movement strongly attracts visual attention, as people tend to notice moving objects first. Based on this principle, motion graphics guide the sequence of focus and enhance the efficiency of information delivery.

Stronger expression ability. Compared with static graphics, motion graphics enhance expression through the extension of 'time', enabling effects such as size changes, zooming, and shifts in viewing angle. With advancements in motion graphics, creators can also integrate sound to enrich expression and engage multiple senses.

The 'Fragmenting' information transmission. This 'fragmented' method of dividing information into different segments for output satisfies the need for people to obtain all kinds of information and entertainment in their short spare time. Along with this trend, motion graphics have been defined as a kind of short-time video, and fragment-based information transmission has become a feature of current motion graphics. In the pursuit of fast information acquisition, people also pursue aesthetic development and improvement of entertainment, the motion graphics can be endowed with more entertainment because of the dynamic visual representation (Tang Jiexiao, 2019). Designers need to emphasise the relevance and logic of presenting information, which is packaged by motion graphics' vivid, interesting and coherent narrative to meet the needs of entertainment and accurate transmission of information. The use of symbolic patterns can effectively improve information identification and understanding (Li Zhuoying, 2018). In the information arrangement by designers, dynamic visual communication can accommodate more information, compared with static

graphics. In addition, the current motion graphics production process tends to be simplified, which is conducive to the rapid capture of new issues and improves the efficiency of information transmission (Tang Jiexiao, 2019).

2.3.4 Fundamental properties of motion graphics

Currently, motion graphics is recognised as a hybrid art in the field of digital design, design work and a hybrid temporal composition (Barnes, 2016), which integrates traditional graphic design and new media technology (Han Jun and Wang Xuchen, 2021). From the perspective of creation, motion graphics integrate various design categories, elements and art forms, such as video, film, animation, photography, illustration, typography and music (Babic et al., 2008). According to Geng (2016), motion graphics is a language with the fusion of film, graphic design and time-based visual design. The fundamental properties contained by motion graphics can be divided into three categories:

1. **The general design properties**: visual effects, 2D or 3D animation, graphic design, illustration design, and font design. Such as illustration, fonts, letters, graphics, lines, and 3D images produced by drawing techniques or modelling software. In the current motion graphics creation, auxiliary music and sound are also considered as the design properties (Seidl, 2013).
2. **The specific property type with creating techniques**: on-site shooting, video, film, animation, and photography (Babic et al., 2008). This type of property is characterised by filming in a real setting rather than being digitally created. Another unique feature of this type of property is that they can stand alone as form of artistic or design expression. Additionally, motion graphics can be their constituent property as well.
3. **The property is promoted by the addition of new technologies**: post-production, sound design and music production, interactive design (Geng, 2016). To improve the audience's expectations of the motion graphics viewing experience, interactive design, sound effects and music in motion graphics are designed and post-produced in accordance with the content.

2.3.5 Functionality of motion graphics

The transformation of information as one of the features of motion graphics has always been emphasised (Woolman, 2004). Compared to other forms of video, such as animation, film, television, motion graphics are designed to be

informative and functional (Bursak, 2018). Designers try to integrate information into motion graphics so that the audience can get mas information in a short time (Wu et al.). According to Geng (2016), the core function of motion graphics is the communication of information. To evaluate the significance of motion graphics in terms of cognitive functions, the communication of an idea is maybe the most important component which motion graphics must fulfil (Babic et al., 2008). Therefore, motion graphics is defined as a comprehensive application of animation, graphic design and information integration, information visual design and a motion presentation of multiple sensory stimuli (Krasner, 2013). The following summarises the basic functions of motion graphics based on Gong Guannan (2016)'s research:

1. Optimisation of information delivery

Motion design not only conveys messages but can also constitute the message itself (Bursak, 2018). Due to its diverse styles and capacity to present information clearly and engagingly, filmmakers often design distinctive motion graphics for film openings. In the television industry, motion graphics are widely applied in channel branding, film, and advertising, with channel visual identity being the primary means of brand differentiation. According to Gong Guannan (2016), customised motion graphics can effectively convey a brand's visual identity and market positioning within a short time, thereby enhancing communication efficiency. In advertising, motion graphics are often combined with live-action footage: live-action conveys intuitive product information, while graphic elements supplement details that cannot be captured through filming (Figure 3).



Figure 3: Tesla AD: Revolutionise Your Commute

2. Expansion of information

Compared with static images, which are limited in information due to their fixed size and immobility, moving images combine visual and auditory changes over time, enabling richer information delivery. Typography in

motion graphics also gains variability, as dynamic text and visuals can simultaneously convey multiple layers of meaning. Through deliberate design, the sequencing of information becomes more hierarchical and organized. Due to their dynamic nature, motion graphics enable purposeful and proactive presentation, where the progression of visual changes guides viewers' attention and structures the reception of information, resulting in clearer communication.

3. Interactivity and entertainment

Motion graphics are also embedded in interactive interfaces, where they are designed according to interface language to enhance and entertain the process of human-computer interaction. This interactivity operates on two dimensions. First, even in passive viewing, dynamic effects and synchronised sounds enrich the experience by simulating actions such as page-turning, folding, or collision, providing multisensory stimulation. Second, when users actively engage, such as clicking buttons to switch videos, motion graphics respond with corresponding visual and auditory changes, creating timely feedback and reinforcing interaction.

2.4 The relationships between motion graphics and associated media

When defining motion graphics, it is often confused with other forms of media. Motion graphics shares similarities with these media in both form and definition but also presents distinct characteristics. In this research, these related media are categorised as associated media, including animation, stop motion, Graphics Interchange Format (GIF), and film. To clarify the scope of motion graphics, the following outlines its relationship with different associated media.

2.4.1 Motion graphics and animation

The dynamics of the animation are produced from a series of sequential images depicting the action, which are played in sequence and quickly through different devices to create the illusion of movement (Song Fangyuan, 2019). 'Animation' stands for 'live sequence image' - continuous image describes motion, from the principle of formation, it includes motion graphics. From the perspective of historical development, 'animation' is used to describe the 'motion illusion',

and the appearance of dynamic graphics is considered as a new design form derived from the art of animation (Krasner, 2013). The abstract experimental animation they created is considered the earliest prototype of motion graphics design. It proves that motion graphics can be considered to be derived from animation and is one of the types of animation (Figure 4)

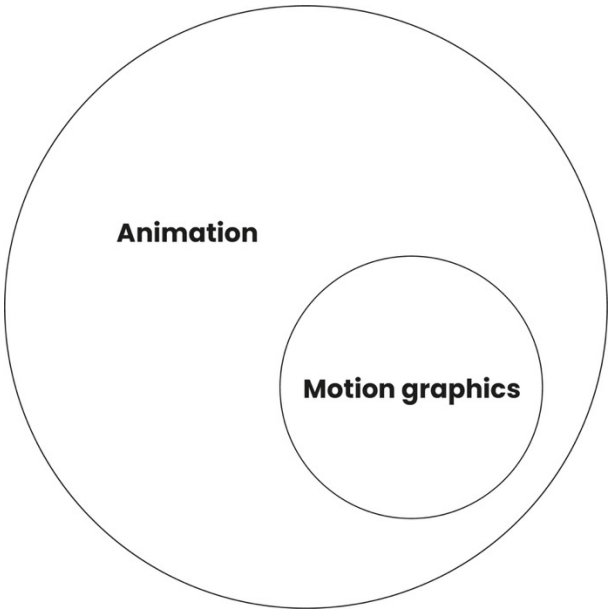


Figure 4: Animation and motion graphics

According to Song Fangyuan (2019), motion graphics and animation are both classified as ‘non-real shooting’ dynamic images, which can be considered as non-location shooting, not green screen shooting and not set-based shooting. This concept of ‘non-real shooting’ expresses the essential character of animation as ‘the art of moving that being painted’. According to Norman McLaren, animation is not a ‘moving painting’, but as a kinetic medium rooted in the act of drawing.[1] What is emphasized is the ‘motion relation’ generated after each action moment depicted is continuously played, which refers to the arrangement and relationship between each frame. This can be interpreted as the relationship or combination order of each frame in the animation being rearranged by the artist or designer, which can break and recombine the original logic that has between two adjacent frames. Animation breaks the original picture logic of ‘real shooting’ and recombines it according to the designer’s intention to form ‘animation’, which is the ‘non-real shooting’ characteristic of

1 McLaren defined animation as ‘not the art of drawings that move, but the art of movements that are drawn.’ This aligns the medium with the temporal, linear process of drawing (kinetic) rather than the static aesthetic of painting (spatial), shifting the focus from the finished frame to the trajectory of motion, a logic fundamental to the development of motion graphics.

animation. This experimental, story-free exploration of graphics recombination, led to the creation of a new branch of animation design, one of them called ‘motion graphics’.

However, the relationship between animation and motion graphics cannot be summed up only with animation including motion graphics. Since motion graphics has developed so far, as stated by Gong Guannan (2016), he believes that motion graphics and animation have essential differences.

According to Gong Guannan (2016), the core of motion graphics is the formation of information meaning, from graphics to symbols with common or universal meaning, achieving the function of interpretation and explanation. Compared with motion graphics, animation focuses more on the description of items and the expression of stories. This brings up the difference between animation and motion graphics. Since the information-conveying function is an obvious feature of motion graphics, as Matt Franz describes, motion graphics are ‘designed non-narrative, non-figurative based Visuals that change over time’. It is considered as a visual expression without story and narrative, which distinguishes motion graphics from animation and film (Yuen). Motion Graphics emphasise the functionality of information sorting and output (Schlittler, 2015), using symbolic graphics to convey. However, animation emphasises the ‘sense of scene’ brought out by the frames. In animation, the overall visual presentation has a certain artistic expression, and in most cases, with a completed storyline. These two are distinguished in format and function (Figure 5).

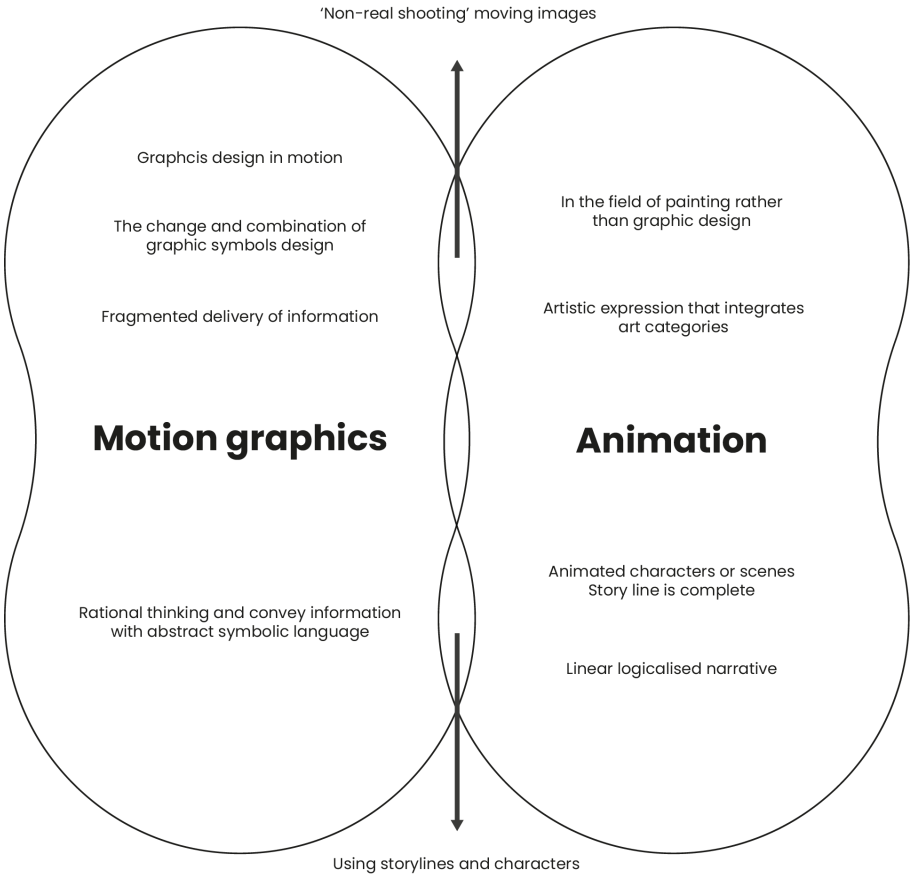


Figure 5 Animation and motion graphics

Motion graphics is often regarded as a form of animation, inheriting its production methods and techniques (Gong Guannan, 2016), and using animation as a means to make graphic design communicate ideas through motion (Schlittler, 2015). With the development of the Internet and related technologies, production methods and tools have become diversified, lowering production difficulty and making motion graphics increasingly prevalent in we-media communication (i.e., a form of communication in which individuals or small groups independently produce and disseminate content using digital platforms) (Li Shanshan, 2016). While motion graphics can be considered one element of animation (Gong Guannan, 2016), the intersection of animation and design has expanded visual design into motion design and fostered new modes of dynamic artistic expression. These works do not necessarily take animation as the final form but may employ it as a methodology or component

of design. In this sense, motion graphics can be seen as a new form of dynamic expression emerging from this development (Song Fangyuan, 2019) (Figure 6).

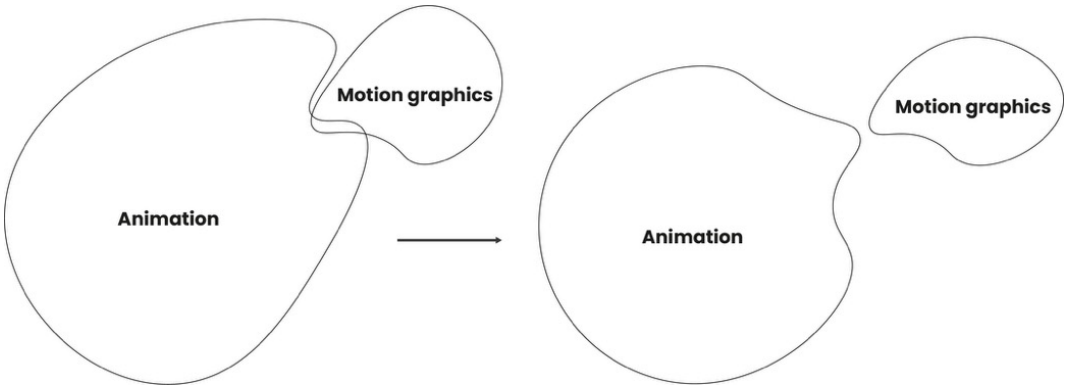


Figure 6: Animation and motion graphics

The concept of animation is diverse, encompassing multiple categories (Song Fangyuan, 2019). It is regarded as a comprehensive dynamic art that integrates film, digital media, photography, music, and other forms of artistic expression (Gong Guannan, 2016). However, with ongoing development, the boundary between animation and motion graphics has become increasingly blurred, as the elements of motion graphics continue to expand. Like animation, motion graphics functions as time-based visual media, often incorporating video, film, photography, illustration, typography, and music (Babic et al., 2008). It can be noticed that there are more overlapping fields between them, and it becomes more difficult to define some dynamic pictures as animation or motion graphics.

2.4.2 Motion graphics and stop motion

Stop motion emphasizes the principle of frame-by-frame playback, distinguishing it from continuous film and video (Li Hanxiao, 2016). As a special type of animation, it differs from other forms in both elements and materials. While traditional animation can be produced through hand-drawn content later processed or via computer software, stop motion is created by photographing each frame of a physical scene and then synthesizing them with software (Xie Jingru, 2015). The materials for scene-setting or character modelling are chosen according to the animation's content, commonly including wood, paper cuttings, and clay (Figure 7).

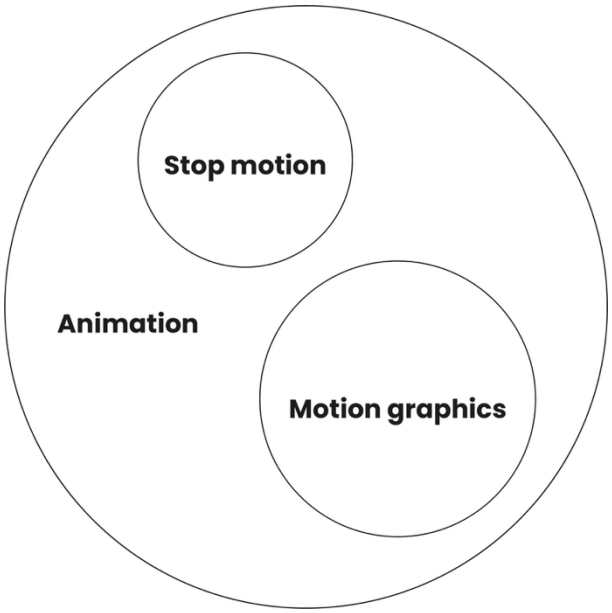


Figure 7: Animation and motion graphics, stop motion

Stop motion is a confirmed form of animation, distinguished from other types only by its unique production method. Both stop motion and motion graphics share the same principle of creating moving images, but their origins differ: motion graphics, initially used for dynamic film titles, are ‘non-real shooting’ graphics, whereas stop motion is created from photographed real scenes. Thus, production method was once the most obvious distinction. However, as motion graphics have evolved to incorporate real photos and images and stop motion has integrated non-real elements such as digitally generated effects (e.g., lightning or wind), this boundary has become less clear. Therefore, the method of production is perhaps no longer the most obvious distinction between them (Figure 8)

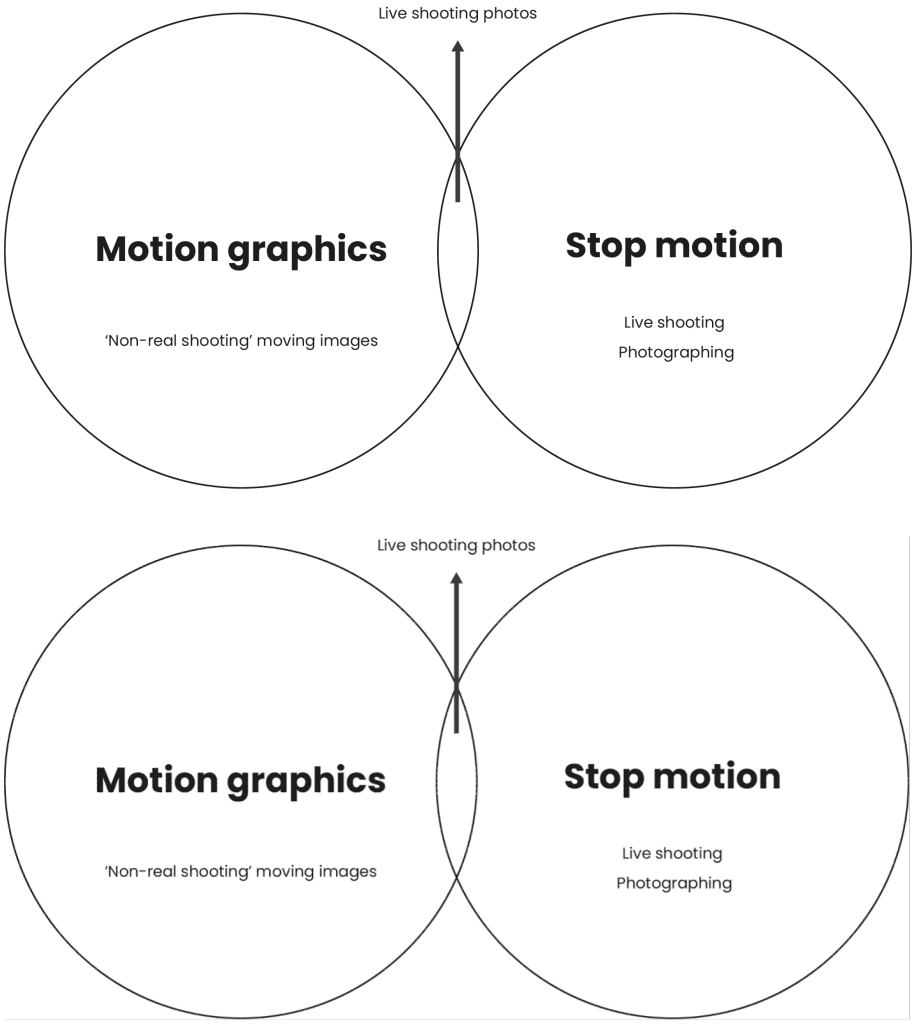


Figure 8: Motion graphics and stop motion

2.4.3 Motion graphics and Graphics Interchange Format (GIF)

Graphics Interchange Format (GIF) represents a transient, infinitely looping sequence of images, such as pattern changes or sequential photographs (Gong Guannan, 2016). GIF can include diverse content, dynamic graphics, images, symbols, and pictures, and is fundamentally a digital file format (Miltner and Highfield, 2017). Technically, GIF is not animation but a form of dynamic image. The key distinction between GIF and motion graphics lies in purpose and creation: motion graphics are deliberate artistic and informational expressions designed by creators, whereas GIF is a digital carrier for visual content. GIF can display motion graphics, animations, and films, but the reverse is not possible; creating a GIF requires pre-existing motion graphics, animation, film, or sequential images. Fundamentally, GIF is a medium, while motion graphics is an expressive form. Their only commonality is that both are dynamic visual expressions (Figure 9).

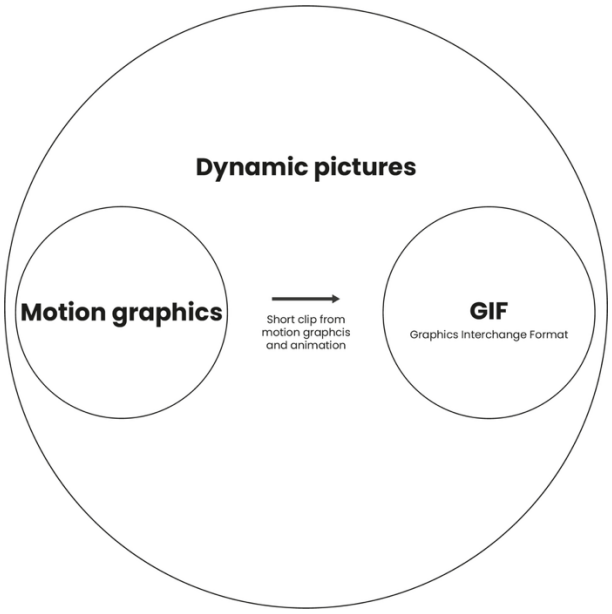


Figure 9: Motion graphics and GIF

2.4.4 Motion graphics and films

Motion graphics is initially used at the beginning of films to convey information through dynamic visuals (Krasner, 2013). Film openings typically feature two dynamic elements: moving text and moving graphics. Text provides concise visual information in addition to language and sound, minimising the presentation of basic film details, while graphic elements dominate the visual effect, coordinate with scene changes, and use symbolic forms for independent information transmission (Zhou Zhe, 2016). At the first stage, motion graphics serves as an informational element within a film. However, contemporary motion graphics now incorporate live-action footage, animation, and other media, which alters their relationship with films. Motion graphics and films are independent forms: a film is not a form of motion graphics, nor is motion graphics equivalent to a film. Films can employ motion graphics as an expressive element, and motion graphics can include live footage as content; the main overlap occurs in the use of camera-shot footage (Figure 10).

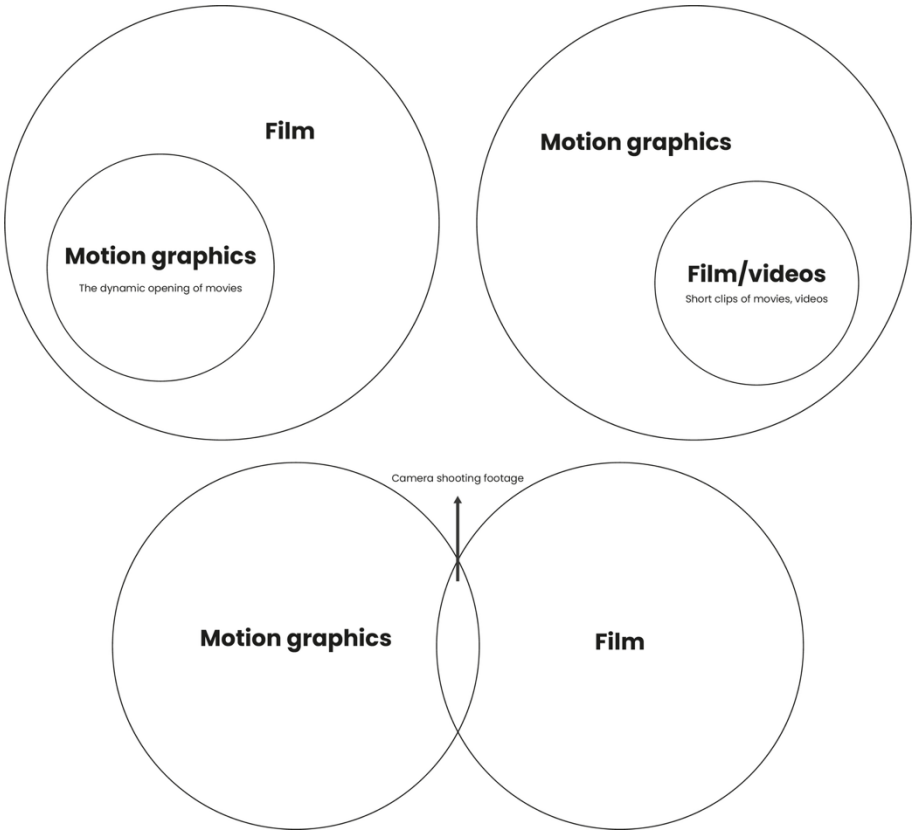


Figure 10: Motion graphics and film

2.4.5 Summary

Motion graphics is historically and technologically related to different forms of media, but there are still differences in the logic of production, the purpose of expression, and the properties of the medium:

Object	Similarities	Differences	Nature of Relationship
Animation	Both belong to the category of non-live-action dynamic images Both create the illusion of motion through frame-by-frame composition	Animation focuses on narrative and artistic expression Motion graphics emphasize information delivery and symbolic communication Animation typically presents complete stories, while motion graphics are often non-narrative	Motion graphics is considered a type of animation, but it has gradually evolved independently as a design-oriented mode of expression
Stop Motion	Both are forms of animation Both generate dynamic effects through frame-by-frame imagery	Stop motion uses live-action physical materials (e.g., clay, paper cut-outs) Motion graphics is primarily composed of digital graphics, initially non-live action	Both are classified as animation, but differ in production methods and material sources; the boundary between them becomes increasingly blurred through hybrid practices
GIF	Both are dynamic images Both can present visual motion effects	GIF is a file format, a carrier Motion graphics is a visual form of expression, a content type GIF does not generate content but only displays it	Motion graphics can be exported as GIFs, and GIFs can carry motion graphics; there is a distinction between format and content
Film	They can incorporate one another (e.g., opening sequences, live-action footage) Both are visual media that integrate sound and imagery	Film is a complete narrative system (plot, characters, etc.) Motion graphics are mainly used for openings, inserts, and information transmission, typically non-narrative in nature	Film may embed motion graphics, and motion graphics may utilize cinematic footage, yet they remain distinct media forms

2.5 Current design of motion graphics

2.5.1 Graphic design

2D graphics

As a basic design property of motion graphics, two-dimensional (2D) graphics use the core principle of motion graphics: when a series of static graphics plays continuously at a certain speed and in a specific order, viewers perceive continuous motion, forming ‘two-dimensional animation’ (Shir and Asadollahi, 2014). As motion graphics is referred to as graphics design into motion, it can be seen that graphic design is a basic design discipline of motion graphics, and the aesthetic theory in motion graphics is mainly derived from graphic design.

3D computer graphics

3D CGI (Computer-Generated Imagery), or three-dimensional computer graphics, uses modelling software to create visuals that emphasise ‘spatial depth and the realistic representation of objects’ (Chen Qian, 2018). It can generate conceptual models based on actual space structures, presenting three-dimensional changes in video form. Such representations provide viewers with a more intuitive understanding of ‘functions, spatial relations, and causal interactions between different components’ (Li Zixiang and Qi Heliang, 2021).

Mixed forms of graphics

Mixed forms of graphics generally involve two situations: The first is when 2D graphics and 3D CGI appear at the same time. When the variation of the 3D model is not enough to clearly illustrate the information, 2D graphics, such as text titles and icons, may be used by designers as a way to supplement the information. The second is the simultaneous appearance of design graphics (including 2D graphics and 3D CGI) and real shooting materials. Take the dynamic graphics for teaching as an example. When the narrator of the course appears to explain, the corresponding dynamic graphics will also depict the scenes and visual materials related to the teaching content in real-time. Such hybrid dynamic graphics include students’ sense of familiarity with the real person stating and the entertainment of the course, helping viewers to better understand the information and promote the visualisation of knowledge. Relatively, this reduces the cognitive burden on the audience, but the hybrid graphics tend to last for a shorter time in motion graphics (Li Zixiang and Qi Heliang, 2021).

2.5.2 Motion design

Motion design in motion graphics refers to the design of motion tracks and changes for different graphics. Whether in 2D graphics and 3D CGI, there are mainly the following moving modes:

- **Basic movement.** For simple 2D graphics, basic motions include displacement, contraction, expansion, rotation, and similar modes. For 3D models, these motions also include spatial rotation and multi-faceted display.
- **Deformation dynamics.** This refers to shape or outline changes of the design subject. Pattern deformation can be regular, providing a sense of order but potentially appearing monotonous, or irregular, creating unexpected and abstract shape changes, such as simulating a splash of water.
- **Texture changes.** This change refers to the shape of the graph does not deform, but its other attributes change. It is common in the changes of colour, material and texture so that the visual emotion and visual impact of the graph on the viewer will change.

2.5.3 Design of time

When it comes to time design, the two concepts commonly mentioned are ‘timeline’ and ‘the point in time’. These concepts correspond to the timeline arrangement and keyframe in a complete animation of motion graphics design. The timeline represents the combination process of motion graphics. All the dynamic changes are processed over the timeline passing. A time point corresponds to a ‘frame’ in the design of motion graphics, which refers to a static image at a certain moment. Frames in motion graphics include keyframes and in-between. The keyframe stands for the key state of the graph change and presents the key information, such as the beginning and end frames of the graph change. The frames included in the process between the beginning and the end are referred to as in-between and represent dynamic developments. Time design is the combination of design subject and time development. Designers control the rhythm of the whole moving process by combining and arranging keyframes on the timeline. The viewer can obtain the process and information of the whole moving process from the beginning, proceeding, climax and ending scene, which are presented by the graphic changes.

2.6 Design of motion graphics: summary

In summary, motion graphics essentially consist of two indispensable core elements: 1) ‘graphics’, which means the expression of visual information; 2) ‘motion’, which means making this visual expression ‘changing’ in the time dimension.

First, the diversity of visual expression forms an important foundation of motion graphics. From early 2D patterns created with software to now the inclusion of 3D graphics, real-life photos, video clips, illustrations, and animation segments, any visual medium that effectively carries and conveys information is considered a ‘graphics’ element in motion graphics. In addition, current motion graphics use sound design and interactive design to further enrich information delivery and enhance audience’s experience.

Second, ‘motion’ as the other core element means that this visual expression inherently has temporality and dynamism. This ‘motion’ includes not only the physical movement of visual elements in the visual field (such as translation, rotation, and scaling) but also any level of change in sharpness, colour, or structure, even when they are not ‘moving’. Therefore, motion graphics are essentially a medium that organises visual information through dynamic presentation. Its time-based nature requires the audience to perceive the complete transmission of information over a period of time.

From a design perspective, creating motion graphics involves decisions on two dimensions:

- The content and form of visual expression (What to show & How to show it visually).
- The motion, time design and rhythm arrangement (How to motion & How long the motion lasts).

These two dimensions together determine the efficiency of information delivery and the audience’s understanding.

At a functional aspect, the core value of motion graphics lies in using a fragmented information structure and dynamic demonstration to deliver relatively complex information more quickly, efficiently, and accurately within a short time. Its diverse visual language, combined with sound and

interactivity, also supports motion graphics to achieve information delivery and entertainment.

It is important to note that ‘simplicity, symbolism, and abstraction’ have been widely used in motion graphics to enhance the clarity and recognisability of the information. However, with the development of media technology, motion graphics is no longer limited to purely abstract graphic language, but also includes figurative representations such as photographs. This means that non-narrative or figurative is no longer a necessary condition for determining whether a motion graphic is motion graphics or not, and that information-carrying, dynamism and temporality are still the core criteria for defining its nature.

Motion graphics intersect with different related media in varying aspects. However, it does not necessarily exist as a standalone means of information delivery. Historically, it always overlaps conceptually with other related media, but this does not mean motion graphics are equivalent to any single related media, because it still retains its unique characteristics.

Chapter 3 | English vocabulary education

3.1 Introduction

Chapter 3 reviews literature on English vocabulary teaching to build the theoretical framework for this study. It covers the relationship between situated learning and classroom teaching, exploring its applicability and practice in Chinese primary education. The chapter also describes the overall status of primary English teaching in China, with a focus on how situated learning is applied in practice.

It introduces the IIO model as a representative teaching approach in the target region's English classrooms. This model focuses on the teaching and learning of vocabulary, it outlines general strategies and methods suited to the Chinese context. It also includes key second language acquisition theories related to vocabulary learning, providing a cognitive basis for understanding how learners acquire vocabulary. The chapter also summarises specific strategies and suggestions for teaching English vocabulary. This theoretical foundation supports the practical teaching design discussions in Chapters 6 and 7, which combine these insights with collected data.

3.2 Classroom teaching and situated learning

3.2.1 English classroom teaching in primary school in China

In current Chinese primary school English education, the long-term influence of exam-oriented education has led to teacher-centred instruction, where students passively receive knowledge with limited opportunities for active participation and language practice (Wang Lijuan, 2025; Liu Zhiyou, 2019). Teachers dominate the class, interaction is insufficient, and students show low learning enthusiasm. Mechanical memorization and repetitive drills are common, with an emphasis on grammar instruction and neglect of communicative competence. The lack of contextual support makes it difficult for students to apply learned knowledge in real-life communication (Chu Yuetong, 2025; Zhao Zhiyan, 2024; Shen Xingxing, 2024). Some teachers, under the pressure of tight teaching schedules, may continue using monotonous lecture-based methods (Chen Dachao, 2025). Moreover, teachers often take on multiple roles, leader, planner, and evaluator, which further limits students' opportunities for expression and creativity, hindering the development of learner autonomy (Chu Yuetong, 2025). For a long time, 'cramming' instruction has remained prevalent in English classrooms, overlooking individual differences and learner agency, and even triggering students' aversion to learning, negatively affecting their motivation and persistence in English study (Liu Zhongli, 2025; Wang Li, 2021).

To improve classroom teaching, the *Compulsory Education's English Curriculum Standards (2022 Edition)* clearly proposes the curriculum concept of 'learning through experience, applying through practice, and innovating through transfer.' It encourages students to engage in language learning activities centred on real-life contexts and problems through understanding, practice, and innovation, thus achieving internalization and application of language. The curriculum goals emphasize that students form language awareness, accumulate language experience, and carry out meaningful communication through perception, experience, accumulation, and application in language practice. This emphasis shows that primary school English teaching in China gradually moves away from the traditional teacher-centred and student-passive teaching model.

Currently, educators try various teaching strategies to improve classroom effectiveness and reduce mechanical rote learning and exam-oriented approaches. For example: 1) Interactive teaching, cooperative learning in groups, role-playing, and gamified teaching are widely applied to enhance students' classroom participation and language application ability (Li Yuehui,

2025). 2) Task-Based Language Teaching (TBLT) emphasizes students completing specific language tasks in real contexts, effectively improving their language practice ability and learning interest (Wang Lijuan, 2025). 3) Mind mapping, with its clear structure and strong logic, gradually becomes an effective tool to assist teaching and help students build systematic knowledge networks (Zhang Xiaofeng, 2025; Ma Meifang, 2023). 4) Strengthening teacher-student interaction in class is regarded as a key factor to improve listening and speaking skills, innovative thinking, and language practice ability; it is an important path to shift primary English classrooms from ‘teaching knowledge’ to ‘promoting ability’ (Ren Ning, 2025).

Among these, situated teaching is the most frequently mentioned by educators. The introduction of immersive teaching and multimedia tools helps create real and vivid language environments, promotes students’ natural language acquisition, and enhances learning experience (Zhang Xiaofeng, 2025; Wang Linna, 2025; Chu Yuetong, 2025).

3.2.2 Situated learning

The concepts of situated cognition and situated learning, proposed by Brown et al. (1989), emphasise that learning occurs through authentic activities and social interaction. Knowledge and cognitive processes are always embedded in social, cultural, and physical contexts. Based on this, Lave and Wenger (1991) describe learning as a process of acquiring knowledge through real-world activities. Learners should engage in authentic environments of practice, gradually gaining skills through increasing participation in a specific community of practice. The learner’s identity evolves through an ‘apprenticeship’ process, moving from a peripheral participant to a core practitioner. They define this process as Legitimate Peripheral Participation (LPP). Their understanding of ‘situatedness’ goes beyond the idea of ‘activities taking place somewhere’; rather, it means that the meaning, structure, and goals of activities are shaped by the surrounding sociocultural context.

3.2.3 The relationship between situated learning and classroom teaching

Lave and Wenger (1991), in their theory of situated learning, critique traditional classroom-based models for overemphasising teaching methods and student knowledge acquisition while neglecting the social context of learning. They argue that learning cannot be fully understood without linking it to the social world, emphasizing that it is not merely a classroom interaction or a one-way transmission from teacher to student.

Rejecting the idea that 'teaching equals learning', Lave and Wenger propose that meaningful learning occurs within Communities of Practice, where learners engage in shared, authentic social practices. Rather than acquiring knowledge passively through structured instruction (e.g., lectures, tests, questioning), learners participate in observation, imitation, and interaction with experienced members, gradually moving from peripheral to central participation.

They particularly criticise classroom discourse patterns in Initiation-Response-Evaluation (IRE) for being overly teacher-centred and restrictive. In contrast, communities of practice rely on informal, experiential, and interactive communication, such as storytelling and shared experiences, which foster active engagement. Here, learning is about understanding the logic of practice, not simply memorising correct answers. Ultimately, Lave and Wenger (1991) argue that learning is not dependent on curricula, lesson plans, or even the presence of a teacher. Instead, it is a cognitive and social process that emerges through participation in meaningful social activities, where learners construct knowledge, internalise behaviour patterns, and form identities through complex social interaction.

3.2.4 Situated learning in the English curriculum in China

According to the *Compulsory Education's English Curriculum Standards (2022 Edition)*, English instruction should be guided by core competencies and promote learning activities within real contexts and problems, emphasising the teaching philosophy of 'integrating learning and thinking, focusing on use and creativity' (Tang Yanhao, 2025). This requirement clearly states that teaching should centre on life contexts relevant to students, bringing language learning back to the essence of communication. In this context, situated learning is not only encouraged and emphasised but also becomes a key path to achieving

curriculum goals. As a result, situated learning has gradually become an important and effective method in foreign language instruction, especially in English teaching, and its widespread application in classroom practice has shown remarkable educational outcomes in China (Lu Feiyu, 2025).

3.2.5 Summary

From the above, it can be noticed that in the construction of the 'simulated yet socially meaningful' contextual learning activities, the increasingly valued situated teaching method in Chinese primary school English education reflects an effort to bridge the gap between 'teaching' and 'learning'. Although primary school English classrooms are artificially created teaching spaces, when teachers use thematically coherent lesson designs, multimedia aids, and simulated scenarios to embed teaching activities within life-related contexts, they provide learning experiences that closely approximate authentic social immersion.

3.3 Situated learning in China

The word 'situation' refers both to specific settings and to emotional or cognitive contexts. Situated learning involves creating meaningful, immersive environments that align with the lesson content, helping students learn through direct experience and apply knowledge more effectively (Jiang Qi, 2024). This method offers scaffolding through resources, environments, prompts, demonstrations, and feedback, supporting students' language development (Zhang Ying, 2025). It emphasises real-life, authentic language contexts to enhance comprehension and usage (Wu Nanfei, 2025), with Mao Huaying (2025) noting its contextual, practical, and engaging features, which support overall student development.

3.3.1 Specific practices proposed for the use of situated learning

Teaching with real-life contexts

Situated teaching should be rooted in real life and students' daily experiences, creating language context close to everyday communication to promote language use (Liu Shuhua, 2025). Teachers can integrate teaching themes with school life settings to build immersive scenarios (Mao Huaying, 2025),

designing practical activities based on textbook content, such as shopping, park visits, or family gatherings, to encourage authentic English dialogues and problem-solving (Jiang Qi, 2024, Wu Nanfei, 2025). These familiar contexts help students use English more easily, reducing learning anxiety and enhancing language awareness (Zhao Ping, 2025).

Incorporating cultural elements of the target language enriches students' understanding of its history, customs, and intercultural differences (Zhao Ping, 2025). Since English differs significantly from Chinese in both grammar structure and cultural background, students may struggle to transfer Chinese learning habits and have interference from native thinking patterns. Therefore, life-like scenarios can boost engagement and promote meaningful, applied practice (Wang Qin, 2025). Using vivid descriptions and visual aids further stimulates interest and emotional connection, enhancing phonetic understanding and language fluency (Wei Wenhao, 2023).

Multimedia as tool

The effective use of multimedia tools in English classrooms can improve students' learning outcomes (Mao Huaying, 2025). Through sound, images, and videos, teachers can design intuitive and dynamic scenarios that help students grasp and apply vocabulary in a relaxed communication setting. It enhances multiple sensory stimulation, increases participation, and improves listening and speaking skills through interactive experiences (Jiang Qi, 2024).

Visual expression, such as animations and videos, makes abstract language concepts concrete, provides authentic input, and supports imitation and repetition for better language acquisition (Xie Jinmei, 2025). Immersive situated design that is present in media also deepens cultural understanding by exposing students to subtle language (Zhao Ping, 2025). By enriching multisensory experiences, multimedia boosts teaching effectiveness, while enhancing the realism and appeal of learning contexts (Wang Qin, 2025). Integrated platforms further diversify teaching scenarios, increasing student participation (Liu Shuhua, 2025).

Role-Playing in courses

Role-playing is a valuable teaching method that enhances students' practical language use by simulating real roles and situations (Mao Huaying, 2025). Through communication, students not only learn expressions but also improve their ability to apply language in contexts. Teachers use specific scenarios

to increase engagement, encourage self-expression, and promote flexible language use in dialogues (Jiang Qi, 2024). Practising conversations in situations strengthens speaking skills and language using motivation. The authenticity and interactivity of role-playing foster immersive learning, shifting focus from memorisation to communication. By designing situational dialogues and guiding role-play, teachers help deepen students' understanding of language use and overall proficiency (Wu Nanfei, 2025).

Teaching with games

Teaching with games blends entertainment with learning, significantly boosting student enthusiasm in English classrooms. Through interactive and enjoyable activities, teachers create a relaxed atmosphere where students acquire language skills, reducing resistance and increasing motivation (Zhao Ping, 2025). As a form of teaching in scenarios, games enhance classroom interaction and align with young students' interest in playing (Zhang Ying, 2025). Game scenarios, characterized by clear goals, realistic contexts, interaction, challenge, and feedback, better match students' cognitive traits than traditional methods, supporting language development as well as critical, creative, and social skills (Wang Qin, 2025). Teachers can use competitions, riddles, or role imitation to promote deeper thinking and knowledge application in entertaining contexts (Zhang Wenxia, 2021).

Games are also effective in phonics instruction. Pronunciation games provide repeated practice, helping students internalize phonemic rules and improve expression (Shen Fang, 2022). In dynamic, multisensory settings, students use body language to enhance interaction and natural expression. Simulating gestures and facial expressions deepens understanding and strengthens communicative ability (Xie Jinmei, 2025).

Task-based and co-operative learning

Task-based activities focus on practical language use through problem-solving and tasks, enhancing students' ability to apply language in context (Zhao Ping, 2025). As a key aspect of situated teaching, task cooperation requires students to work in groups, promoting communication and improving learning outcomes.

Teachers design diverse, challenging tasks based on students' proficiency levels to ensure active participation and meaningful collaboration. Task-based learning also supports learner autonomy and helps students develop scenario-building skills, strengthening overall language competence (Zhang Ying,

2025). Through group work, students think, communicate, and solve problems together, deepening their language learning interactively and purposefully (Wang Qin, 2025).

3.4 The IIO model

According to the *Compulsory Education Curriculum Plan (2022 Edition)* issued by the Ministry of Education of the People's Republic of China:

> 'The compulsory education curriculum includes three categories: the national curriculum, the local curriculum, and the school-based curriculum. The national curriculum serves as the core, establishing a shared foundation; the local and school-based curricula function as extensions and supplements, accommodating regional and individual differences. The national curriculum is centrally developed and established by the educational administrative department under the State Council, and all students are required to study it in accordance with regulations. The local curriculum is coordinated and planned by the provincial-level educational administrative departments, which also determine the main bodies responsible for its development.'

> 'Provincial educational administrative departments are responsible for coordinating the implementation of the three curriculum types and formulating provincial-level implementation guidelines for compulsory education in a scientific manner. Schools, following the provincial curriculum implementation guidelines, are expected to develop school-specific curriculum implementation plans based on their educational philosophy and available resources. These plans should ensure an integrated design approach, effective implementation of the national curriculum, standardised delivery of the local curriculum, and rational development of school-based curricula.'

It can thus be understood that local curricula are designed and developed by provincial-level education authorities based on the national curriculum as the core, with the aim of tailoring instruction to local educational needs and contexts.

In the region targeted by this research, Guangzhou city, a commonly adopted instructional approach in primary school English classroom education is the 'IIO model', which serves as the foundational teaching framework. The following introduces the structure and features of this model:

Regarding the development of the IIO model, Gass (1988) introduced the Input-Interaction Model, emphasising the facilitating role of interaction in processing input. Later, Gass and Selinker (1994) proposed a more detailed theoretical framework for SLA, which describes five stages through which language input is transformed into output: apperceived input, comprehended input, intake, integration, and output (Bahrani et al., 2014). Gass (2013) (First Published in 1997) also conceptualised the Input-Intake-Output (IIO) model as the core pathway of SLA, with the five-stage model being a more elaborated specification of this fundamental IIO process.

Based on the above, Ling Shunshi (2015) adjusted and expanded the original model to better fit the context of Chinese students and various English teaching classroom situations, continuously refining it through ongoing teaching practice. The IIO model proposed by Ling Shunshi (2015) further clarifies the five stages of teaching: Teaching Preparation-Language Input-Language Internalisation-Language Output-Learning Assessment.

The model has been widely applied in the regions targeted by this research and is regarded as an effective teaching framework that benefits English teaching practices (Peng Yaping, 2020). The following is a brief overview of Ling Shunshi (2015)'s IIO teaching model (Figure 11):

- *Preparation*: The teacher arouses the students' attention, introduces the learning objectives and tasks, and designs and organises activities to activate the students' prior knowledge.
- *Input*: The teacher creates a language contextual scenario in which students can be exposed to and understand the language.
- Internalisation: Students practice the language in various ways, forming a knowledge structure.
- *Output*: Students output the language in various ways, applying it within different contextual scenarios.
- *Assessment*: The teacher evaluates the students' classroom performance, learning effectiveness, and post-class outcomes.

Ling emphasises that the core components of the model are input, internalisation, and output. The order of these three stages is fixed, but they can be cycled.

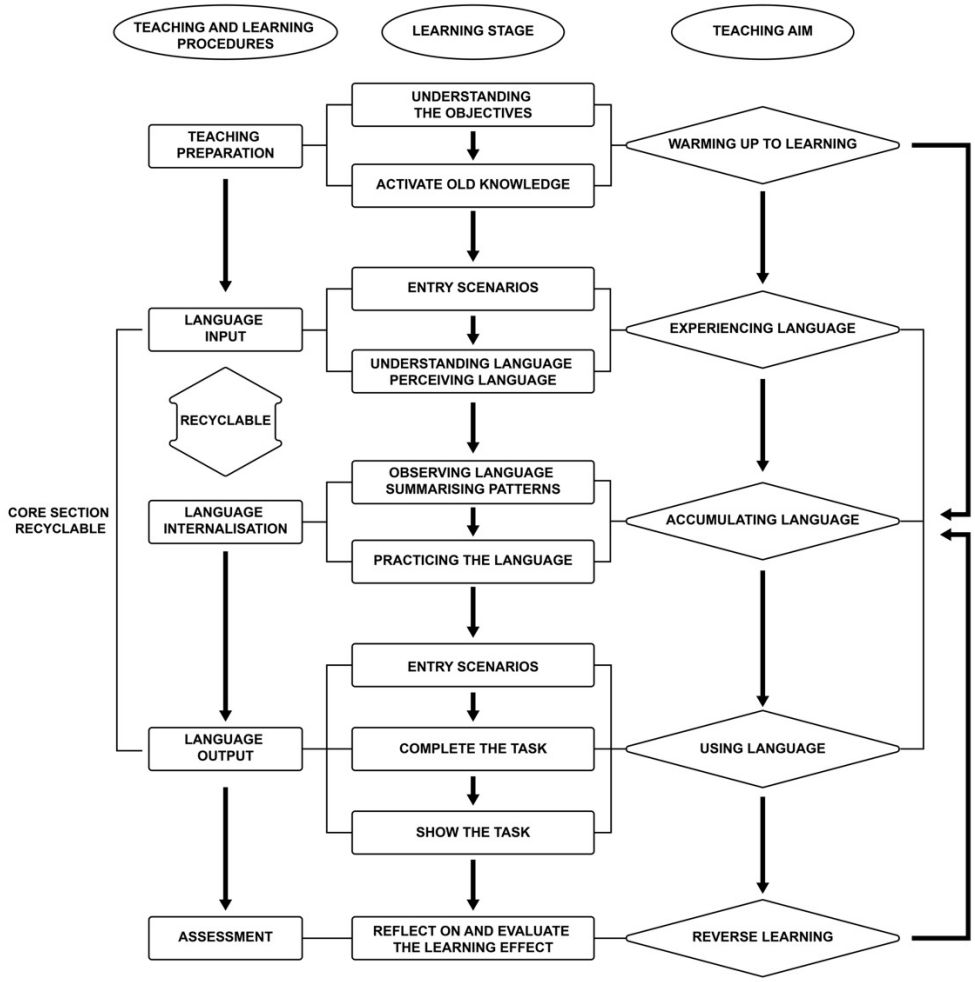


Figure 11: The IIO teaching model proposed by Ling Shunshi (2015)

3.5 English vocabulary teaching and learning

3.5.1 Vocabulary teaching method

The schemes and strategies for English vocabulary teaching can be divided into the following types:

- **Direct vocabulary teaching**
  The direct teaching method focuses on explicitly presenting target vocabulary, including pronunciation, spelling, meaning, and usage (Penno et al., 2002). Educators deliberately link new words to the text content, enabling students to quickly grasp their specific meanings and reinforce correct usage (Carey, 1978). Common techniques include using photographs or real objects to illustrate word meanings (Wallace, 1982).

- **Incidental vocabulary teaching**
  Incidental vocabulary learning involves acquiring vocabulary indirectly through exposure to words in context, which enhances vocabulary knowledge and usage skills (Penno et al., 2002). A rich linguistic environment and extensive reading increase opportunities for vocabulary encounters and support the use of contextual guessing strategies during reading and communication (Nation et al., 1997). Moreover, repeated reading improves vocabulary comprehension and reinforces word usage (Biemiller and Boote, 2006).

- **Related vocabulary teaching**
  Related vocabulary teaching emphasizes helping students connect new words with their existing knowledge. For English vocabulary instruction in primary schools, Bannon et al. (1990) propose the P.A.V.E. procedure, which includes Prediction, Association, Verification, and Evaluation. Students first predict the meaning of new words through guessing or other strategies. Then, educators associate the words with visual images to support memorization. To build connections between new and known vocabulary, Bromley (2002) suggests that linking word meanings with images is effective. She introduces the concept of vocabulary anchors, which involves learning new words based on previously acquired vocabulary. However, Johnson and Gu (1996) caution that relying solely on visual repetition may negatively affect the accuracy of vocabulary retention. Bromley (2002) also notes that mechanical repetition is ineffective; instead, students must draw on their existing vocabulary knowledge to support new learning.

- **Classification systematic teaching**
  Classification systematic teaching organizes vocabulary instruction into stages based on learners' proficiency levels, guiding them through understanding, cognition, and usage. According to Allen (1983), vocabulary teaching can be divided into three stages: for elementary learners, instruction focuses on understanding word meanings; for intermediate learners, teaching is tailored to their specific vocabulary use abilities; for advanced learners, the emphasis is on enhancing vocabulary application skills.

Educational researchers increasingly explore English vocabulary teaching by integrating strategies that were once considered separate (Li Lingxuan, 2019). Direct and incidental vocabulary teaching are now often combined. However, regardless of the method used, it is essential to consider the difficulty level of the vocabulary. Nagy et al. (1987) point out that overly difficult words can hinder students' vocabulary acquisition, while Carlisle and Katz (2005) arguing that words that are too simple may limit vocabulary development.

3.5.2 Teaching English vocabulary in China

According to the *Compulsory Education's English Curriculum Standards (2022 Edition)*, the nine-year curriculum (six years of primary school and three years of middle school) is divided into a preparatory level and three learning stages (Levels 1–3). Grade 2 students are at the preparatory level of English learning. The teaching guidelines at this level are as follows:

1. Students are just beginning to learn English, and language acquisition relies on visual, auditory, and oral activities.
2. Instruction should focus on students' experiences, prior knowledge, and hands-on practice to stimulate interest and sustain attention.
3. A motivational assessment approach should be adopted to encourage active participation in learning activities.

Learning activities and learning requirements at the Preparatory Level – Grade 2 (Table 1):

Learning Activities	Requirements
Listen and Act	• Understands and responds appropriately to simple classroom instructions. • Acts on heard words or instructions, such as pointing to pictures or objects, colouring, drawing, or performing gestures. • Understands simple stories and responds appropriately when prompted by pictures and gestures. • Understands and responds appropriately to simple short stories prompted by pictures and actions.
Speak and Sing	• Imitates English speech based on recordings. • Exchanges simple greetings. • Shares basic personal information (e.g., name, age). • Guesses meanings and says words based on performance cues. • Sings songs and rhymes independently or in groups. • Says words or phrases based on visual prompts (e.g., pictures). • Expresses simple feelings such as likes and dislikes.
Play and Perform	• Participates in English games under teacher guidance, using simple English to communicate during the game. • Engages in basic role-playing activities under teacher supervision.
Watch and Listen	• Watches simple English cartoons or educational programs, grasps the general meaning, and imitatively speaks simple words. • Spends at least 20 minutes per week watching and listening during class sessions.

Table 1: Learning activities and learning requirements

3.5.2.1 English vocabulary teaching methods

The vocabulary teaching methods in primary schools is mainly based on two directions:

> **Specific teaching methods**. Teachers use techniques such as English word mind mapping to enhance vocabulary understanding (Li Binna, 2016). Peer learning and group study among students of similar levels improve comprehension and memory, while promoting habits of previewing and reviewing words (Li Dongmei, 2016). Contextual teaching stimulates students' interest and initiative in vocabulary learning (Lian Dongxue, 2018).

Theoretical foundations. Vocabulary teaching is guided by educational theories to support learning. For example, applying schema theory enhances students' understanding and memory of words (Liu Xiaoqin, 2013). Based on dual coding theory, guiding students to associate vocabulary with imagery helps extend memory retention (Zhang Jing, 2018). Integrating multimodal theory into instruction improves vocabulary acquisition and practical usage (Pang Junyu, 2018).

3.5.2.2 English vocabulary teaching strategies

There are two main teaching strategies implemented by teachers in the classroom:

Specific vocabulary teaching. This involves word presentation, usage instruction, and review. Teachers present words through direct explanation, scene setting, and associative objects, using tools such as multimedia, pictures, and body language (Yuan Guanghuan and Tang Yanfei, 2006). Teachers use objects, pictures, multimedia, and body language to convey word meanings. Vocabulary usage is reinforced through reading, games, songs, and poems (Sun Xufeng, 2012), while review activities employ games and contextualization to consolidate memory (Yuan Guanghuan, 2008).

Procedural teaching. Vocabulary learning is embedded into classroom procedures. Methods include direct instruction and scenario-based teaching. Students are exposed to new words via phonics instruction, song-based learning, imagery techniques, and exploration of new vocabulary (Li Wei, 2012). Vocabulary memorisation methods include active mnemonics and classified mnemonics (Gao Yunfang, 2005).

3.6 Vocabulary acquisition by English as a Foreign Language learners

3.6.1 Communication and environment

According to Rohde Rohde and Tiefenthal (2000), Learners acquire vocabulary when they need to express objects or convey needs, receiving input that allows them to isolate word forms, generate meanings, and map them onto forms. Brewster et al. (2002) state that learners acquire language through three processes: psychological, linguistic, and cultural preparation. Piaget (1970) emphasises that children are sensitive to their learning environment and acquire knowledge by exploring it. Similarly, Vasiliki (2019) notes that young learners naturally learn through practical experiences in their surroundings.

Environmental interaction plays a central role in vocabulary cognition. Vygotsky (1934) highlights the importance of social interaction in knowledge acquisition, which parallels the role of communication in language learning. Schmitt (2000, as cited in (Vasiliki, 2019)) argues that vocabulary learning is less effective when focused solely on isolated words and more successful when it supports communicative goals, particularly through interaction with more advanced interlocutors (Bruner and J., 1985). This principle also applies to second language acquisition in children. Cameron (2001) observes that informal communication, adult interaction, and storytelling facilitate children's early language acquisition.

3.6.2 Age and language learning achievement

One prominent theory in the discussion of age and language learning is the Critical Period Hypothesis (CPH), originally proposed by Lenneberg (1967, as cited in Flege (2011)). The CPH posits that there is a biologically determined window for optimal language acquisition, typically from around age 2 until puberty. Haznedar et al. (2010) argue that there is a specific developmental window in which language acquisition is most effective. Young learners tend to be more receptive to language input and learn foreign languages with relative ease (Susan Halliwell, 1992, cited in Vasiliki (2019)). Penfield and Roberts (2014) claim that language learning becomes more difficult after age ten due to physiological changes. CPH is often associated with brain plasticity, which may also influence second language acquisition (Song Wei and Zhou Jiaxian, 2013). Chomsky and Lenneberg (1967) emphasises that physiological constraints during the critical period affect general language learning ability.

However, this view is debated. Some scholars argue that early learning advantages may apply only to specific linguistic domains rather than to overall proficiency (Vasiliki, 2019). Xia Sisi (2015) suggests that different aspects of language learning, such as pronunciation, vocabulary, grammar, and spoken fluency, each have their own critical or sensitive periods. Scovel (1988) maintains that age primarily affects phonological acquisition. Vasiliki (2019) further notes that listening and pronunciation benefit most from early exposure.

In the context of second language learning, Diller (1981) and Long (1990) argue that native-like pronunciation must be acquired before age 6 or 8. Learners who begin after age 12 are unlikely to achieve native-level accents. Late exposure also leads to challenges in morphology and syntax. Weber-Fox and Neville (1996) find that age of exposure affects grammar processing but not semantic understanding. Children who begin learning a second language earlier tend to develop more efficient grammatical processing strategies. Regarding vocabulary acquisition, Carey (1978) identifies a ‘vocabulary spurt’ in the early stages of first language development. Children use surrounding language to label objects, resulting in a cognitive process known as ‘fast mapping’, where they quickly associate new words with referents. O’Dell (1997, cited in Konstantakis and Alexiou (2012)) suggests that vocabulary should be a primary focus in the initial stages of language instruction.

However, some linguists challenge the universality of the CPH in second language learning. Stern et al. (1983) argue that no specific critical age exists; learners of different ages possess distinct strengths and weaknesses. Osterhout et al. (2006) suggest that learning outcomes depend more on the quantity and quality of language input than on age. Muñoz (2010) finds that accumulated exposure is a stronger predictor of language learning outcomes than age of acquisition. Over time, the advantages of early starters diminish (Larson-Hall, 2008), and age does not yield long-term learning benefits (Muñoz, 2010).

For second language learners, grammar development is influenced by cognitive maturity. Cameron (2001) points out that grammar should not be introduced too early, as it relies on learners' evolving cognitive skills. Similarly, Harley and Wang (1997) argue that improvements in grammar and vocabulary reflect continuous cognitive development. Given these contrasting perspectives, the relationship between age and second language achievement remains inconclusive (Vasiliki, 2019). Despite the lack of consensus, many countries began promoting foreign language instruction in primary schools during the 1950s and 1960s, possibly inspired by Penfield's vision of early second-language training (Wang et al., 2017).

3.7 English vocabulary: teaching approaches

Vocabulary acquisition involves multiple dimensions, including content selection, teaching methods and tools, strategies to enhance awareness, retention techniques, and assessment (Allen, 1983). Various instructional approaches exist, such as the lexical approach, theme-based learning, lexical phrases, grammar-translation, audio-lingual, and communicative language teaching (Mcbain, 2011). Vocabulary selection should align with learners' proficiency, prioritizing high-frequency words, and distinguishing between receptive (passive) and productive (active) vocabulary (Anil, 2011; Nation, 2001; Vasiliki, 2019)

3.7.1 Interaction and activities

Effective vocabulary learning emphasizes communication, interaction, and contextualized use (Schmitt et al., 2001; Ubaque & Pinilla, 2018). Real-life scenarios, collaborative tasks, and physical engagement enhance retention and encourage active language use (Vasiliki, 2019). Total Physical Response (TPR) and task-based activities support learner participation, combining cognitive, social, and physical dimensions. Structured yet varied activities, balancing energetic and calm tasks, help regulate attention and maintain motivation (Scott & Ytreberg, 1990; Yip & Kwan, 2006; Kubanek-German, 1998).

3.7.2 Visual stimulation and audio-visual approaches

Visual and auditory input enhances vocabulary acquisition by providing contextualized and multisensory stimuli (Plass & Jones, 2005; ÖZKURKUDİS & BÜMEN, 2021). Dual coding theory suggests that combining images with verbal information activates both cognitive channels, improving memory retention (Paivio, 2013). Animated videos, cartoons, and multimedia presentations allow learners to infer meanings, practice pronunciation, and construct knowledge actively, supporting both comprehension and application (Unnathamani & Sumanjari, 2022). Guided use of these audio-visual tools fosters learner engagement and creates a more immersive, effective vocabulary learning environment.

3.8 English vocabulary education: summary

This chapter presents the core application context of the research: the use of motion graphics in English vocabulary teaching and learning within Chinese primary school classrooms. It outlines that the current pedagogical approaches in this setting are informed by Situational Learning and are systematically implemented across different teaching stages following the IIO teaching model. Further, the chapter highlights that the generic approaches to vocabulary teaching in the literature are related to the specific pedagogical needs and localised practices in Chinese primary classrooms. To further contextualise these practices within a theoretical framework, the chapter introduces key factors that influence vocabulary acquisition among EFL learners. This theoretical grounding, drawing from Second Language Acquisition (SLA) research, helps explain why these localised teaching approaches are particularly well-suited to the cognitive and linguistic characteristics of Chinese students.

Chapter 4 | Motion graphics and English vocabulary education

4.1 Introduction

Chapter 4 focuses on the relationship between motion graphics and English vocabulary teaching and reviews current related research. The potential of motion graphics in language education has attracted increasing attention. In particular, during the development of vocabulary acquisition, a core component of language proficiency (Beglar and Hunt, 2005), the visual support provided by motion graphics is believed to effectively enhance learners' memory and comprehension (Ridha et al., 2022). However, research specifically focusing on the relationship between motion graphics and vocabulary learning remains limited. This chapter reviews directly related studies while also drawing on indirectly relevant research findings as a supplement. This chapter groups relevant studies into two categories: (1) research on the use of motion graphics in education, and (2) research on related media in English as foreign language learning.

The first part reviews how motion graphics are used in educational contexts to boost learning motivation, enhance understanding, and improve memory, providing case support for their potential role in language teaching. The second part looks at media studies related to L2 learning, discussing how dynamic images, animation, and video support vocabulary acquisition and extend to relevant motion graphics design strategies. The chapter highlights gaps in current research, especially the lack of studies on concrete design methods for using motion graphics in vocabulary teaching.

4.2 Motion graphics in education

The study conducted by Al-Turki and Alharbi (2024) explores the effectiveness of using motion graphics on English vocabulary acquisition among intermediate students. Through a comparison between an experimental group and a control group, the results indicate that the integration of motion graphics significantly enhances students' vocabulary mastery.

The study highlights that student engagement is a key factor in how motion graphics facilitate vocabulary learning. By offering dynamic visual effects, auditory cues, and interactive features, motion graphics create a more immersive and engaging learning environment, which in turn improves students' understanding and retention of vocabulary. This approach proves beneficial for various learner types, particularly those with a kinesthetic learning style.

In addition, the study emphasises that teachers can employ contextualised motion graphics and engaging multimedia to provide students with enriched learning experiences. Through the use of dynamic visual presentation and interactive components, motion graphics not only support diverse learning preferences but also help establish more intuitive and lasting connections between vocabulary and its context, thereby enhancing learning outcomes.

In a study on the impact of motion graphics on English language learning, Gumilang et al. (2024) investigate whether the integration of motion graphics incorporating local cultural content can enhance vocabulary acquisition and student interest in Indonesian high school English classrooms. The findings reveal that embedding local cultural elements into motion graphics-based instructional media not only increases classroom engagement but also helps students connect vocabulary learning with everyday life experiences, thereby facilitating understanding and retention. The media include diverse vocabulary embedded within local cultural contexts, enabling teachers to guide students in more active learning activities. Furthermore, the study points out that students show a high level of interest in the use of locally contextualized motion graphics due to their relatable content and visual design.

Indrawati et al. (2021) conduct a controlled experimental study among university students to examine the impact of motion graphics in English language learning. The results indicate that the integration of motion graphics significantly improves students' English proficiency and proves to be more effective than Video-Based

Learning (VBL) methods. The study highlights that motion graphics are both highly informative and entertaining, capable of stimulating students' interest in learning and enhancing classroom engagement. Students report experiencing enjoyment during the learning process. The use of rich visual content, illustrative explanations, and contextual examples makes motion graphics an informative medium that facilitates better comprehension and application of language knowledge. Students generally find this teaching method refreshing, easy to understand, and motivational. They also believe that it helps them better grasp the material and apply it in real-life situations, thereby increasing their learning motivation. Additionally, motion graphics are typically developed based on clear instructional objectives and structured storyboard designs, resulting in well-organized and targeted learning materials.

In a study on elementary students' learning outcomes, Hapsari and Hanif (2019) finds that motion graphics animation videos effectively enhance fifth-grade students' knowledge acquisition in science subjects. The study investigates animation videos, motion graphics, and cartoons as a unified category of media to examine their overall impact in classroom instruction. The results show that, compared to traditional teaching methods that do not incorporate animated media, the use of motion graphics videos leads to significantly better learning outcomes. The study recommends that the content and design elements of videos should align with students' developmental characteristics and cognitive abilities. Motion graphics animation videos not only facilitate a better understanding of instructional content but also offer a more engaging learning experience, boost students' motivation, and enhance classroom attention (Gellerstedt et al., 2018, Yakovleva and Goltsova, 2016, Khalid et al., 2010).

Moreover, Hapsari and Hanif (2019) and Naylor and Keogh (2013) highlight that, compared to textbooks or static 2D images, animated videos, due to their richer content and greater visual appeal, significantly increase students' interest in learning. When combined with appropriate interactive features and tailored to students' actual needs, motion graphics can further optimise the learning experience. This perspective echoes the findings of Berney Berney and Bétrancourt (2016), who argue that animated presentations are more effective than static images in supporting cognitive activities such as memory, comprehension, and application.

In a follow-up study, Hanif (2020) further demonstrates that motion graphics videos are more effective than static image-based learning media in explaining

abstract concepts and complex materials. The study emphasises that combining interactive animations with embedded practice activities within videos helps sustain students' attention during the viewing process (Naylor and Keogh, 2013).

Hanif (2020) once again stresses that the dynamic presentation of animated content effectively captures students' attention and stimulates their interest in learning. The interactivity and sense of enjoyment created by animation videos make the learning process more engaging and support student-centred instructional models. Furthermore, the study points out that motion graphics animation videos can effectively activate students' cognitive abilities and help them focus on the instructional content, an effect attributed to the strong connections established between the teaching materials and students' everyday experiences.

The above studies indicate that motion graphics play a significant facilitative role in education: 1) through dynamic visuals, auditory cues, and interactive elements, motion graphics enhance student engagement, comprehension, and memory retention; 2) incorporating culturally relevant or experience-based visual content further stimulates learners' interest and strengthens contextual associations in language acquisition (Gumilang et al., 2024, Teng, 2023, Seidlhofer, 2013, Fatma, 2025, Mayer, 2002); 3) motion graphics offer distinct advantages, featuring higher information density, clearer structure, and the ability to create enjoyable and immersive learning environments; 4) studies focused on primary school students have shown that animated videos are more effective than only textbooks or static images in improving comprehension, attention, and motivation; 5) particularly when addressing abstract or complex content, motion graphics are more capable of guiding cognitive focus and promoting thinking, thus significantly enhancing the overall learning experience and instructional effectiveness.

4.3 The related media used in EFL learning

Munir (2016) adopts a pre-experimental design to investigate the role of cartoon films in EFL teaching at the primary school. The results show that cartoon films, as a teaching medium, effectively enhance students' vocabulary acquisition. The vivid visual and auditory stimuli increase students' interest in learning and improve memory retention. The study recommends that English teachers

actively incorporate cartoon-based multimedia tools into vocabulary instruction to improve teaching effectiveness.

Yawiloeng (2020) conducts a study on Thai university students to examine the effectiveness of using English vocabulary instructional videos. The results show that video-based teaching has a significant impact on vocabulary learning and receives positive feedback from students. Firstly, learning outcomes improve significantly. A paired-sample t-test analysis indicating that video instruction enhances vocabulary acquisition. Secondly, students generally hold positive attitudes toward learning through videos. Most participants express enjoyment in learning vocabulary via videos, describing the format as vivid, engaging, and helpful. Regarding preferences for video presentation formats, students consider the most effective format to be: native language (L1) + target language (L2) bilingual subtitles + images + English narration.

Younas and Dong (2024) conduct a study to evaluate the effectiveness of animated films in enhancing English vocabulary learning among 12th-grade students in Lahore, Pakistan. The results reveal that students in the experimental group, who receive instruction through animated films, perform significantly better on vocabulary tests compared to those in the control group. Specifically, animated films lead to notable improvements in both receptive and productive vocabulary, demonstrating their broad applicability across different levels of vocabulary learning. Students generally believe that this method enhances their interest in learning, improves memory retention. The study also highlights that integrating animated films into classroom instruction not only boosts students' motivation and engagement but also contributes to the diversification of vocabulary teaching methods.

Khadawardi (2022)'s study aims to investigate the effectiveness of using animated movie clips with English subtitles to teach second language (L2) vocabulary, with a particular focus on their impact on both short-term and long-term vocabulary retention, and students' learning motivation. The findings indicate that watching animated movie clips with English subtitles significantly improves students' ability to recognize, understand, and remember vocabulary. It also positively influences their motivation to learn. The study further suggests that integrating multimedia tools, especially subtitled animated movie clips, into vocabulary instruction can enhance learning outcomes, stimulate student interest, and increase classroom engagement.

The study conducted by Yetti et al. (2024) investigates the effectiveness of using English animated videos as a teaching medium to enhance early children's English vocabulary recognition skills. The research involves 28 first-grade students from a primary school in Indonesia and applies the Classroom Action Research (CAR) model proposed by Kemmis and McTaggart, implemented over two instructional cycles. The results show a significant improvement in students' vocabulary recognition skills. Students also demonstrate increased interest and motivation in learning, along with higher classroom participation, further confirming the role of this medium in fostering positive learning attitudes. The study emphasizes the advantages of multimedia teaching in early childhood language education.

In English as a Foreign Language (EFL) instruction, motion graphics and related media tools are recognized for their effectiveness in enhancing vocabulary acquisition and learning motivation (Al-Turki and Alharbi, 2024, Jahanlou et al., 2020, Muftah, 2023, Gilakjani, 2012). Studies show that formats such as animated videos, cartoon films, and subtitled clips, through the integration of visuals, audio, and contextual content, not only improve students' vocabulary retention and comprehension but also boost classroom engagement and interest. In particular, contextualised media, bilingual subtitles, and visual-audio instructional methods cater to diverse learning preferences. Animated media effectively support vocabulary input and output across various age groups, including children, primary school students, and university learners. Students generally perceive these media as vivid, memorable, and engaging, breaking the monotony of traditional instruction and offering richer and more effective pathways for learning.

4.4 Motion graphics and English vocabulary education: summary

Building on the context established in Chapter 3, it is clear that English vocabulary teaching in Chinese primary schools is shaped by the educational theories mentioned above and has its unique teaching characteristics. However, within this specific pedagogical context, the use of motion graphics reveals a distinct research gap. Current literature predominantly focuses on 'whether' motion graphics are effective, rather than systematically exploring 'which' specific design features enhance learning. This body of research also relies heavily on quantitative methods, thus lacking the in-depth qualitative insights

into teacher and student needs that are essential for developing context-relevant interventions, which is essential. Furthermore, a significant limitation is the scarcity of research on how to effectively integrate motion graphics with localised teaching strategies to cater to diverse learners (Al-Turki and Alharbi, 2024).

To address this research gap, the following chapter details the research methodology with the aim of providing concrete and practical contributions to the field. The methodological choice aims to move beyond the traditional binary question of effectiveness. Instead, it seeks to explore in-depth (1) which core design elements of motion graphics are crucial for vocabulary acquisition in the Chinese primary classroom context, and (2) how these effective designs can be optimally integrated with localised pedagogical strategies. The aim is to provide concrete and practical contributions to the field by answering these critical ‘how’ and ‘what’ questions.

Chapter 5 | Methodology overview

5.1 Introduction

Chapter 5 outlines the methodological framework of the research. The philosophical underpinning is pragmatism, under which Educational Design Research (EDR) serves as the guiding approach for the overall research process. In response to the demands and constraints encountered in the practical research context, the research primarily employs qualitative research methods. Specifically, data collection techniques include semi-structured in-depth interviews with teachers, aimed at capturing their teaching experiences and feedback; and visual analysis, drawing on Rose (2022)'s Visual Methodologies, to examine the design properties of motion graphics. This chapter also details how the research strictly adheres to Lancaster University's ethical guidelines to ensure the protection of all research participants, particularly by safeguarding the confidentiality and data of teachers as direct participants, and by addressing the ethical responsibilities concerning students as indirect participants. Finally, the chapter presents the specific procedures followed throughout the data collection and analysis phase of this research.

5.2 Pragmatism as a research paradigm

The concept of pragmatism, first introduced by Peirce in 1878, refers to any statement being meaningful, it must have practical bearings, and the need to consider what practical benefits can be achieved when using different actions. In 1907, the book, Pragmatism: A New Name for Some Old Ways of Thinking, by James (1907), is published, leading to a more systematic theorisation of pragmatism. Pragmatism emphasises utility: all 'claims' and 'arguments' can only be called 'the truth' when they have been applied in practice, solved the problem, and produced real utility.

Guided by pragmatism

This research aims to develop design guidelines for motion graphics that effectively support educational practices. These guidelines are intended to inform and guide the practical design process, ensuring that the resulting outputs align with the needs and dynamics of real-world classroom settings. In line with pragmatist philosophy, the design needs and evaluation criteria are derived from the interactions among users, contexts of use, and the relationships embedded within these scenarios. For pragmatists, knowledge is meaningful only when it emerges from lived experience and contributes to practical application.

According to pragmatism, knowledge that lacks relevance to actual relationships and contexts is devoid of practical utility and, consequently, of meaning. Therefore, the design guidelines proposed in this research must be firmly rooted in classroom realities. From a pragmatist perspective, reality, perceptions, and relationships are constantly evolving, which in turn opens possibilities for innovation in what is considered 'knowledge'. Accordingly, the guidelines developed here are not fixed truths but adaptable principles that can evolve with changing educational circumstances and user needs.

The relationship between designer and user reflects the pragmatist view of inquiry: both are engaged in a dynamic, dialogic, and iterative process. Users bring diverse experiences and expectations to the design, while designers interpret and respond to these needs through their professional judgement. This interactive process ensures that outcomes remain relevant and responsive.

The emphasis on utility central to pragmatism aligns well with the domain of motion graphics for educational use, which belongs to both pedagogical

research and design science. In this research, particular emphasis is placed on the real-world utility of design outcomes, making iterative design a crucial methodological principle. Accordingly, the research adopts an Educational Design Research (EDR) approach (section 5.6), which involves iterative cycles of analysis, design, implementation, and evaluation to refine both theory and practice.

Guided by pragmatism, which advocates a demand-driven approach, utility as a guide to the purpose, and an inclusive approach to the mixing of multiple research methods for pragmatic purposes, which leads to this research can be based on design research generated by design science, with a mixed research approach, using different methods to explore research questions in complex real-world contexts.

5.3 Qualitative approach

Qualitative and quantitative research are conceptual pairs used together to better understand the world (Brown, 2010, Becker, 2017). These methodologies differ significantly in structure and focus (Becker, 2017). According to Sofaer (1999), qualitative research seeks to understand people's experiences, perspectives, and meanings through non-statistical data. It primarily focuses on the complexity of social phenomena, human behaviours, and the deeper significance of social interactions. In contrast, quantitative research is concerned with measuring variables and analysing numerical data to test hypotheses. It aims to understand the measurable properties of an object.

In academia, qualitative research examines subjects that are difficult to quantify, whereas quantitative research focuses on numerical analysis. These two approaches are often perceived as being in stark contrast: qualitative research is seen as non-numerical, while quantitative research is associated with numbers and calculations. However, this distinction is perhaps still superficial (Aspers and Corte, 2019). Quantitative research relies on statistics and experiments, emphasising causality and the control of variables. In contrast, qualitative research focuses on human culture (Bogdan and Biklen, 1997). The choice between these methods should be based on the research question and hypothesis of the study (Grinnell Jr and Unrau, 2005).

Aspers and Corte (2019) propose a new characterisation of ‘qualitative’ in research, emphasising the iterative process. This cycle involves collecting data, analysing, revising the research question, and collecting data again to deepen the understanding of a phenomenon, rather than conducting a one-time study. In addition to iteration, Aspers and Corte (2019) highlight the importance of understanding the phenomenon through various methods, such as observation and interviews, to access first-hand experiential information. Due to this iterative nature, new categories, relationships, and patterns continuously emerge during the research process, rather than being constrained by existing theories.

Regarding the use of qualitative research in education, Bogdan and Biklen (1997) emphasised that it is a research methodology aimed at understanding the meaning of individual experiences, primarily in their natural settings. Researcher seeks to explore the experiences of students and teachers in authentic teaching and learning environments rather than in laboratory settings. As the primary instrument of data collection, the researcher conducts personal observations, records interviews, and interprets the data, while relying less frequently on questionnaires and statistical software. In education-related research, the primary purpose of using qualitative methods is to provide a rich description, offering descriptive data and analyses of results rather than relying on statistics or numerical figures. The focus is on understanding how students learn and how teachers teach, rather than solely on final test scores. Instead of applying preconceived assumptions, researchers develop new theories based on the data.

In this research, qualitative methods serve as both the primary and the most effective approach for studying education. Data collection and analysis are divided into 3 phases.

In the first phase, the focus is on understanding: 1) the definition of motion graphics within this research; 2) the interactions between motion graphics as an instructional tool and both students and teachers in the classroom; 3) the assessments of both teachers and students regarding the use of motion graphics. At this stage, the primary concerns include teachers’ perceptions of motion graphics as users, the experiences of teaching and learning with motion graphics in the classroom, and the behavioural responses and evaluations of motion graphics. Qualitative methods provide the researcher with direct access to stakeholders, enabling an in-depth understanding of experiences, the collection of descriptive data, and the production of rich descriptive results.

The second phase of the research involves testing possible design guidelines derived from the information gathered in the first phase. This phase requires an understanding of the experiences of teachers and students generated by the use of newly designed motion graphics in the classroom. The qualitative approach allows these new designs to be introduced directly into a classroom setting rather than a hypothetical experimental environment, enabling direct engagement with users of motion graphics to understand their reactions and evaluations. Furthermore, following the principles of Educational Design Research (EDR), the second phase of testing follows a cyclic and iterative process, aligning with the iterative nature of qualitative research.

In the third phase, the primary focus is to provide the preliminary motion graphics design guidelines developed in the first two phases to professional practice designers for validation. This phase aims to evaluate the practicality and applicability of the proposed guidelines in real-world design contexts, as well as to collect designers' revision suggestions based on their actual professional needs. The qualitative research approaches adopted in this phase can gain deeper insights into designers' responses to the guidelines. Rather than merely determining whether the guidelines are useful, qualitative methods enabled a more nuanced understanding of designers' experiences, challenges, and specific needs during practical application.

5.4 Semi-structured in-depth interviews

Interviews are among the most widely used methods in qualitative research (Creswell et al., 2007), serving as a key technique for exploring participants' perspectives, including their values, emotions, and behaviour (Chen Xiangming, 2000). While semi-structured or lightly structured interviews are commonly adopted in empirical studies (Mason, 2002), unstructured interviews are more recommended for longitudinal investigations. Compared to structured formats, unstructured interviews allow respondents to express themselves freely, in their own words and at their own pace. (Corbin and Morse, 2003).

A semi-structured interview format is adopted for this research. Given that the participating teachers do not possess a professional background in design, it is essential for the interviewer to provide guidance during the interviews to prevent digressions from the research focus. The semi-structured interview is a type of

in-depth interview in which participants respond to a series of pre-determined but open-ended questions (DiCicco - Bloom and Crabtree, 2006). This format allows for the development of a structured interview guide that maintains a clear alignment between the interview content and the core research questions (Creswell et al., 2007).

Moreover, the use of a semi-structured format facilitates a systematic and comprehensive investigation of diverse participant perspectives (DiCicco - Bloom and Crabtree, 2006). The semi-structured interview offers a degree of flexibility that allows the interviewer to adapt the flow of the conversation or pose follow-up questions based on participants' responses, as long as they remain aligned with the research context (Creswell et al., 2007). This adaptability facilitates the collection of more detailed, and contextually relevant data, while also ensuring that participants' subjective perspectives and individual experiences are adequately captured. It also ensures that key areas of inquiry are consistently addressed across interviews, thereby enhancing the comparability and depth of the data collected.

In terms of duration, a typical semi-structured interview lasts between 30 minutes and one hour (DiCicco - Bloom and Crabtree, 2006), which provides sufficient time to explore participants' views in depth while remaining feasible within the constraints of the research timeline.

Thematic analysis

According to Virginia Braun and Victoria Clarke (2006), Thematic analysis, as one of the widely used methods for the basic analysis of qualitative data, is an approach that systematically identifies, organises, and provides insights into patterns of meaning (themes) within a data set. This method identifies and interprets collective or shared meanings and experiences, focusing on meanings across the entire data set. Thematic analysis allows researchers to identify patterns of meaning that are related to the particular research question to be explored. Different data sets can be identified with a variety of patterns, but the purpose of the analysis is to identify those with respect to a specific research question. Themes are captured as what is in the data for particular research question, and represent a patterned response or meaning that is oriented towards a particular aspect of the data set. Thematic analysis allows the researcher to focus on the data in a different way. A researcher can use thematic analysis to get an overall meaning across the data set, or focus on

a specific aspect to deeply investigate the phenomenon. The above features make thematic analysis suitable for a variety of different research questions.

The accessibility and flexibility of thematic analysis lead to its use as the analytical method in this research. It provides qualitative research with a clear and systematic approach to coding and analysing data. In this research, it offers a mechanism for connecting the findings with broader theoretical perspectives (such as pedagogical theories) and conceptual issues (such as the conceptual identification of motion graphics). Thematic analysis is not dependent on a particular theoretical position, making it highly flexible and therefore can be easily used by the researcher as needed. Thematic analysis is simply used as a data analysis method rather than an approach to construct qualitative research, which is its strength for maintaining accessibility and flexibility. In this research, all the interview data will be analyzed using this method.

5.5 Visual analysis

The visual analysis methodologies being used in this research, as proposed by Rose (2022), involve the systematic examination of visual material to understand its meaning, production, and impact. According to Rose, visual images are not merely passive expressions but are closely related to cultural and social contexts. The following are key approaches to visual methodology:

Compositional Interpretation
This approach is most concerned with the elemental composition of the image itself. It explores the different structures in an image and how the different components work together to produce a particular visual effect. The composition refers to the combination of elements: Content, Colour, Spatial organisation, The temporal organisation of moving images, Sound, Light, Expressive content.

Content Analysis

As a systematic, quantitative approach, it is based on counting and analysing the frequencies of visual elements of a certain population of images. The analysis process involves a coding system with the following steps:

1. Depending on the question to be explored, select the corresponding images as sample.
2. Devise a series of categories or criteria used for coding.
3. Systematic coding of image samples.
4. Counting the codes that attached to each image to produce the frequency counts.

5.6 Educational Design Research

Educational Design Research (EDR) emerges to balance theoretical development with practical utility. Influenced by experimental psychology (Brown, 1992, Collins, 1999), educational researchers often use controlled experimental settings to isolate variables and construct theories. However, practising educators argue that such theories frequently overlook the complexity of real classroom environments, thus lacking ecological validity and offering limited practical impact. In contrast, the purpose of educational research is to meet practical needs, identifying needs in practical situations, proposing solutions and testing is a necessary process. However, real-life situations are often too complex and various factors can have an impact on the research, leading to doubtful findings (Weng Yingzhe and Tan Keping, 2008). Educational Design Research (EDR) responds to this challenge by integrating theoretical inquiry with iterative, practice-based investigation.

Brown (1992) introduces a new approach to educational research, known as the design experiment, by drawing on concepts from design science. This approach evolves through various phases, including Formative Research (Frick and Reigeluth, 1999), Development Research (Akker, 1999), and ultimately Design-Based Research (DBR) and Design Research (DR) (Zhu Zhiting, 2008). The purposes of the DBR approach including design products, improving practice and theoretical establishment (Weng Yingzhe and Tan Keping, 2008). Product design is a strategy for creating and developing theories (Edelson, 2002). The theoretical basis is constantly and systematically modified according to the

improvement of the products and the effectiveness testing, so that the theories can be adapted to the specific context. Ultimately, the theories and design products work together to improve a practical problem or fulfil the needs. DR refers to the systematic exploration and generation of knowledge within human ecology, guided by design thinking and a project-oriented methodology (Findeli, 2008). Educational researchers later adopted those approaches, giving rise to Educational Design Research (EDR).

According to Plomp (2013), EDR can be defined in two ways, depending on its distinct purposes:

> *Developmental research refers to educational research designed to develop research-based solutions to complex problems in educational practice.*
>
> *Validation research is defined as the study of educational interventions (learning processes, learning environments, etc.) with the aim of developing or validating theories about these processes and how to design them.*

Regarding EDR, the following aspects need to be included in the research process (Zhu Zhiteng, 2008):

> **Pragmatic**: design research focuses on both theory and real-life situations, where theory can be validated and developed through real-life situations using Educational Design Research (EDR). Experimental activities serve as approaches to creating theory. Design research needs to be conducted in real-life situations that encompass the complexity, dynamics, and limitations of authentic practice, as opposed to the controlled conditions of a laboratory. Practitioners have first-hand experience with teaching methods and the learning problems encountered by students. Design research facilitates collaboration between researchers and practitioners to address practical problems and real needs in the most effective and practical way (Edelson, 2002).
>
> **Contextuality**: The findings of the research are inseparably linked to the contexts involved in the research process. The design research approach requires educational researchers to conduct research in actual teaching and learning environments, understanding how students learn and how

teachers teach in real-life situations. It involves designing products to improve education and establishing teaching and learning theories through the use of these products and usage testing (Weng Yingzhe and Tan Keping, 2008). Different factors in the research environment lead to biased findings. The classroom is an open environment where various factors interact, which makes it difficult to carry out rigorous variable control. Moreover, a holistic understanding of the environmental factors is necessary before sampling and variable control (Brown, 1992).

However, design studies do not completely exclude experiments in controlled environments. In conjunction with research in practical settings, researchers conduct small-scale tests in controlled environments, where the results of these studies serve as a preliminary basis for theoretical research or as a post-test of the findings.

Integration: during the research process, the researcher uses as many research methods and instruments as needed. EDR allows the research to be multi-sourced, providing a wealth of evidence for the findings and increasing their credibility. Different research techniques can be used to provide multiple sources of research data and cross-check, improving the accuracy and credibility of the findings. This aligns with EDR's requirement for the integration of research methods and data.

In the EDR process, the collaboration between researchers and practitioners enables the design to be applied in practice. The aims of EDR vary, but the research process incorporates a systematic design research process, a cyclical process: analysis, design, evaluation, and revision activities cycle until an appropriate balance is achieved between the ideal state (expected) and realistic outcomes. This cyclical process is interpreted differently by the researcher depending on the design requirements. According to Plomp (2013), deductive approaches are diverse, but researchers agree on the existence of a core process in EDR: the preliminary research phase, the development or prototyping phase, and the assessment phase, which can be explained as follows (Figure 12):

> **Preliminary research**: in this stage, researchers understand and analyse the real-life situation of the research problems, the related theories, and the real-life context in which it is involved. Before conducting formal experiments, testing material interventions, and

collecting data, the researchers should document completely and systematically the different elements of the teaching environment, such as the student's learning journey, the teacher's teaching behaviour, the participants' interaction within the classroom education, the teaching tools, and the lesson time. By analysing the overall context of teaching and learning in which the research is situated, the researchers establish a conceptual or theoretical framework for the research.

Development and prototype testing phase, or implementation phase: this phase involves a cyclical process of testing, analysis, and correction (Collins et al., 2016, Collins, 1999, Edelson, 2002). Each cycle, which includes established assessment sessions, serves as an important research activity in this phase. After gaining a complete understanding of the research context and the real-life educational environment, the research should materialise the conceived design concept into a design product based on the results of the previous analysis. The product then should be tested in the chosen scenario and get feedback, which is used to revise both the design and the relevant design theory (Bannan-Ritland, 2003, Cobb, 2001, Cobb et al., 2003, Collins et al., 2016).

Assessment phase: (semi-) summative evaluation, in which the proposed solutions and test materials are evaluated to determine whether they meet the expected outcomes. The focus of this phase is to analyse the entire design and testing process to understand the effectiveness of the design prototype in meeting needs (Bannan-Ritland, 2003, Cobb, 2001, Cobb et al., 2003, Collins, 1999). This phase may still generate ideas for improvements to the solution, so it may also be called a semi-summative phase.

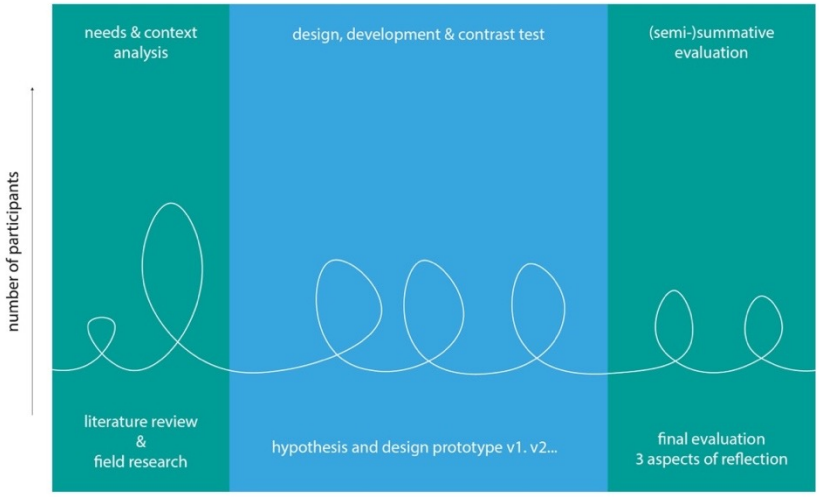


Figure 12: Cyclical process of EDR

Applying education design research

This research is guided by the philosophy of pragmatism, which requires that its outcome, the design guidelines for motion graphics in education, remain grounded in real-world practice and have practical impact. As Brown (1992) suggests, educational research can be viewed as a design process that develops theory to be applied in practice, ultimately contributing to improved teaching and learning. Therefore, research on the educational tool of motion graphics should align with the nature of educational research. The pragmatic focus on the application of theory to practice underpins this approach.

In educational research, there are many complex factors to consider when designing educational products, such as the impact of different variables in a design space (Collins, 1992). The design of motion graphics as an educational tool needs to consider the impact of different factors in the real-life classroom. The design research, as a research method suitable for teaching and learning activities in real-life situations (Kolodner, 2001), allows researchers to systematically explore the design space with experiments and to apply the findings to complex real-world contexts (Weng Yingzhe and Tan Keping, 2008). Theory building is the main purpose of the design research method (Barab and Squire, 2004, Collins et al., 2016, Cobb et al., 2003, Collective, 2003), which is in line with the purpose of this research to explore design guidelines. To investigate the design guidelines of motion graphics, the validity of the

guidelines needs to be reflected in the utility examination. In design research, product design is a strategy for the development of the theory (Edelson, 2002), which applies in this research. The motion graphics should be tested systematically by the design purpose and effectiveness, in order to revise the theoretical underpinnings, so that the design guidelines can be supported by data.

5.7 Cross-semester, multi-cohort, iterative testing design

The iterative testing in this research adopts a cross-semester, multi-cohort testing design to enhance the robustness and generalizability of its conclusions within the target research context. Specifically, the iterative tests are conducted across two different semesters in Grade 2, thereby involving two independent groups of Grade 2 students. Although the teaching content varied due to differences in semester progress, all lessons strictly followed the Grade 2 curriculum, ensuring a consistent difficulty level aligned with the requirements. This design is not a passive acceptance of variables, but rather a deliberate methodological choice, with advantages in two key aspects:

1. **Enhanced generalizability.** Compared to tracking a single student cohort throughout the research, which offers in-depth insights into individual changes, this design increased participant diversity by including two distinct student groups. This effectively reduced the risk of cohort effects, where conclusions might otherwise only apply to a specific group's unique characteristics. As a result, the findings are not limited to the 'one particular Grade 2 student group', but are more representative of 'Grade 2 students in this teaching context' in general, thus improving the generalizability of the conclusions.

2. **Validation of design guidelines robustness**. The value of design guidelines lies in whether their effectiveness remains under different conditions. This test design directly simulated that challenge: by showing that the same design guidelines produced consistent effects across two different student groups and two different sets of teaching content, it demonstrated that their effectiveness is fundamental rather than coincidentally tied to a specific group or lesson content.

In summary, this design traded longitudinal control over individual participant variability for broader applicability and robustness of the conclusions in the target teaching setting. It is a methodological decision aligned with the aim of this research.

5.8 Ethical considerations

This study strictly follows Lancaster University's ethical guidelines and has received formal approval from the FASS-LUMS Research Ethics Committee.

All interviewees are in-service primary school teachers in China, who participate as direct participants. They receive full study information via email or printed materials (including the participant information sheet, interview guide, confirmation of details, and explanation of research aims). Teachers voluntarily agree to participate after fully understanding the research's purpose, interview process, and potential risks. Before each interview, the researcher explains participants' rights, including the right to withdraw at any time, and obtains their signed consent forms.

To protect participants' privacy and data security, all collected data is stored on Lancaster University's OneDrive with restricted access. Transcripts are anonymised or pseudonymised to remove any identifiable information. Only the researcher has access to the original recordings, transcripts, and related files, which will be securely stored for at least ten years after the project ends, in line with university policy.

Participants agree and consent to partial anonymity with the use of their professional title (e.g. teacher 1) and the description of the institution/ organisation they are affiliated with to be referred to (e.g., attributed quotes) in any published journal articles, presentations, funding applications or other publications. In all relevant publications, the participants' real profiles will be erased or anonymised, and their videos, photos, and any other content that shows their identity will be removed. All possible steps will be taken to protect the anonymity of the participants involved in this research.

In addition, the indirect participants in this research are the students in the classes taught by the interviewed teachers. Since the research focuses on second-grade primary school students in China, and the schools protect

young students (under 18 years old) by prohibiting direct contact between students and external researchers, students can only participate indirectly. The researcher gathers information about students' responses and the impact of using motion graphics in learning through teacher interviews and their daily classroom observations. Without this indirect involvement, it would not be possible to obtain the necessary primary data.

5.9 The flow of data collection and analysis

To answer the research questions in Chapter 1, the data collection and analysis in this research is designed as a 3 Phase series that needs to be completed sequentially, where the findings of the previous phase inform the next one (Figure 13):

- Phase 1: Contextual and insight study of motion graphic design and use
- Phase 2: Prototyping, iterative contrast tests and design guidelines
- Phase 3: Guideline formulation, validation and updating

Phase 1 consists of two parts: insight interviews and visual analysis. In the INSIGHT INTERVIEWS, teachers are interviewed to explore their understanding and definitions of motion graphics. Since teachers are the primary users of motion graphics, the focus is on their usage methods, purposes, motivations, and specific design needs. Meanwhile, students, as the main audience and recipients, are analysed for their behavioural characteristics related to motion graphics. The VISUAL ANALYSIS focuses on the design elements of motion graphics in current teaching materials, examining their visual features and how these designs respond to users' needs.

Combining interview and visual analysis results, this phase describes teachers' teaching methods, students' behavioural traits, and the design features of existing materials. It provides an integrated analysis based on educational and design theories. The study identifies design elements to retain, those recognised by both teachers and students as effective for teaching and learning, and elements needing improvement, which have limited support for teaching. Relevant educational theories are applied to deepen the understanding of student behaviour and learning processes, offering theoretical support for subsequent design optimisation. The detailed research process is described in Chapter 6.

Phase 2 mainly includes three parts: prototyping, review interviews, and iterative contrast tests and interviews (feedback interviews 1&2). Based on the design insights gained from Phase 1, the study first develops PROTOTYPE 1 of the motion graphics, which serves as the core material for subsequent testing. Iterative contrast tests consist of two rounds. Before the first round, the researcher makes modifications to PROTOTYPE 1 according to the interview and analysis results, which invites teachers who will use the materials to participate in a review interview. This allows for an initial evaluation and feedback to make necessary revisions before classroom use, resulting in PROTOTYPE 2. This step helps align the design more closely with teachers' practical needs and minimises potential negative impacts in child-centred learning contexts.

PROTOTYPE 2 is then used in the first round of testing. After teaching with PROTOTYPE 2, teachers participate in FEEDBACK INTERVIEWS 1 to assess the new version, describe students' classroom responses, and provide feedback on its effectiveness. These interviews focus on how different design adjustments impact teaching and learning outcomes. If a specific adjustment proves beneficial, the related design insight can be confirmed and retained as an effective design principle; if not, further revisions are needed. Based on this feedback, PROTOTYPE 2 is refined into PROTOTYPE 3, which undergoes a second round of contrast testing to verify whether the adjustments better support the intended teaching goals. Following this teaching, teachers are again interviewed (FEEDBACK INTERVIEWS 2) to evaluate the final version and summarise design features that have a positive impact on teaching and learning. This process leads to the initial development of practical design guidelines and feasible design directions. Through this iterative cycle of prototyping, testing, interviewing, and refinement, the study aims to ensure that the resulting design principles are both theoretically grounded and empirically validated, effectively addressing teachers' and students' real needs in authentic classroom contexts. The detailed research process is described in Chapter 7.

Phase 3 is dedicated to the formulation and refinement of the design guidelines through expert validation. Building on the findings from the preceding phases, an initial set of design guidelines is systematically developed. Subsequently, these guidelines are presented to professional design practitioners for evaluation. Through the VERIFICATION INTERVIEWS, this phase aims to validate the clarity, practicality, and applicability of the proposed principles within actual design workflows. Comments from these designers are also utilised to assess the novelty and complementarity of the guidelines and to gather recommendations for their optimal presentation and structure. Finally, based on the insights, the guidelines are updated to ensure they provide tangible and actionable value for design practice. This process is detailed in Chapter 8.

Figure 13: The flow of data collection and analysis

Chapter 6 | Phase 1 data collection and analysis

6.1 Introduction

Chapter 6 presents the process and findings of Phase 1 data collation and analysis in this research. The process of Phase 1 is structured as follows (Figure 14):

Part 1 consists of INSIGHT INTERVIEWS with teachers, focusing on understanding their perceptions of motion graphics to define the specific scope of motion graphics within this research (respond to RQ1). The interviews also explore the challenges and opportunities motion graphics present as a teaching tool (respond to RQ2 and RQ3). The interview results are analysed using qualitative thematic analysis. Based on teachers' understanding of motion graphics and the categorisation of design properties introduced in Chapter 2, the specific categories of design properties relevant to this research are identified.

After the specific design properties are defined, the research moves to **Part 2**, which involves a VISUAL ANALYSIS of the currently used teaching materials. This analysis serves two main purposes (respond to RQ4):

- To understand the current features of different design properties in current materials.
- To conduct a selective analysis based on the findings from the insight interviews, examining how the identified design properties respond to the needs and issues raised in Part 1.

Following these two parts, the research enters **Part 3**: Discussion.
The discussion draws upon four perspectives (respond to RQ4):

- Design hints from interviews (Part 1): Teaching approaches shared by teachers that inspire motion graphics design.
- Current design practices (Part 2): Insights derived from the visual analysis results.
- Pedagogical theories: Teaching principles reflected in teachers' practices.
- Design theories: Guidelines from existing design principles related to different motion graphics properties.

Through synthesising practical insights (from teacher interviews and visual analysis) with pedagogical and design theories, this chapter generates context-specific initial design insights for motion graphics in this particular teaching context.

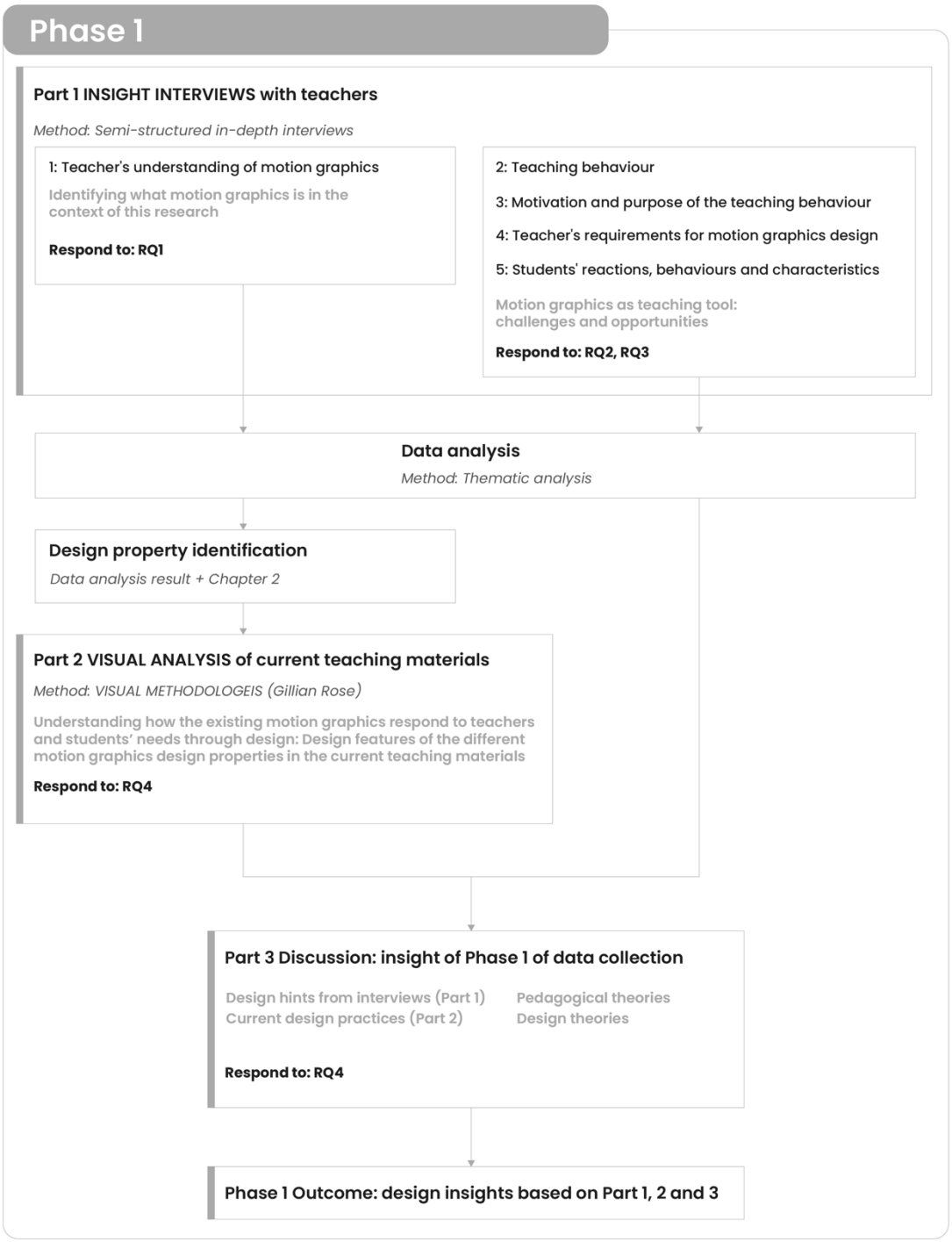


Figure 14: The process of Phase 1

6.2 Process of Phase 1

6.2.1 Part 1: INSIGHT INTERVIEWS with teachers

6.2.1.1 Data collection: semi-structured in-depth interviews

This INSIGHT INTERVIEWS adopt semi-structured in-depth interviews as the primary method for collecting data on teachers' understandings of motion graphics, their classroom applications, the purposes and motivations underlying their usage, and their specific needs and requirements regarding motion graphics as an instructional tool. Additionally, insights into students' reactions, behaviours, and characteristics in response to motion graphics are obtained indirectly through teachers' observations and reflections. During the interviews, the interviewer systematically guides participants to articulate their reasoning, instructional intentions, and design needs about various teaching scenarios involving motion graphics. Simultaneously, the interview structure allows for flexibility, encouraging teachers to freely express their subjective views and experiences. These open and reflective responses may offer valuable insights for the formulation of potential design guidelines.

The INSIGHT INTERVIEWS are conducted in Cantonese, the most familiar and native language for locals in Guangzhou. According to the participating teachers, using Cantonese allows them to express their views more clearly and comfortably. Participation is voluntary. To protect anonymity and confidentiality, each participant's identity is replaced with a pseudonym (e.g., Teacher A) after the interview. The interviews are conducted in a mixed format, either online or in person, depending on the teachers' availability. However, the interview process remains consistent across both formats: the same set of content is presented to each interviewee, and only an audio recording is collected.

6.2.1.2 Profile of participants

Part 1 involves both direct and indirect participants. The direct participants are English teachers from primary schools in China. At the time of the interview, the participating teachers have completed teaching the second semester of Grade 2 in 2023. Therefore, the students they teach English in Grade 2 are considered the indirect participants. These Grade 2 students are all 7-8 years old.

There are 7 participants in total, all of whom are practising teachers serving in seven different primary schools within Guangzhou City, China. Each of them

is officially registered in the national educator system and holds valid teaching qualifications. All participants have teaching experience across Grades 1 to 6 in primary school and have participated in curriculum workshops, equipping them with knowledge of lesson design and the pedagogical needs specific to teaching English in primary education. Some of the interviewed teachers also teach across different subjects during the same academic term, which suggests that they interact with a wider group of students beyond those they teach English. Additionally, some teachers serve as class supervisors. In such roles, they are more likely to monitor students' academic progress across multiple subjects and thus have a deeper understanding of the students' overall learning development. Several teachers are responsible for teaching English to more than one class in the same term. As a result, they gain broader insights into students' English learning across different groups.

The following table (Table 2) provides an overview of the direct participants and their corresponding indirect participants:

Date of interview	Direct participant	Format of the interview	Duration of interview	Indirect number of participants	Teaching across subjects	As class supervisor
28 July 2023	Teacher A	Online	02:05:49	85 (2 classes)	No	No
09 August 2023	Teacher B	In person	01:41:00	43 (1 class)	Yes	Yes
26 August 2023	Teacher C	In person	01:43:44	80 (2 classes)	No	No
26 August 2023	Teacher D	In person	01:43:44	78 (2 classes)	No	No
19 August 2023	Teacher E	Online	01:41:13	86 (2 classes)	No	No
17 August 2023	Teacher F	Online	00:42:47	86 (2 classes)	Yes	No
30 July 2023	Teacher G	Online	01:00:25	45 (1 class)	No	Yes

Table 2: Overview of the participants

6.2.1.3 Semi-structured interview scope

Depending on the format of the interviews, there is a semi-structured interview script. According to the corresponding research questions, the interview script includes the following sections:

Section 1: Teacher's understanding of motion graphics

The first section of the interview focuses on the teacher's perception of motion graphics. Teachers, as the direct users and operators of multimedia tools utilising motion graphics. Motion graphics are presented to the students as a teaching tool according to different teaching approaches when needed. The design of motion graphics is directly related to the teacher's use and it influences the effectiveness of their teaching. As mentioned in Chapter 2, motion graphics do not have a general accepted definition in academia. With the premise that this research focuses on the specific research context of classroom teaching and learning, teachers' understanding of motion graphics can guide the specific visual elements used in the design, which is the focus of this research. Therefore, teachers are invited to describe their understanding of motion graphics in Phase 1.

During the interview, teachers are asked questions such as 'What do you think motion graphics are? What are motion graphics in the teaching materials you use?'

Section 2: Teaching behaviour

Section 2 aims to understand how teachers use motion graphics in teaching and to identify specific behaviours during instruction. Teachers present motion graphics in lessons based on their needs and teaching processes. Their teaching behaviours and usage directly influence the design of motion graphics. The design of motion graphics should align effectively with teaching approaches to support efficient teaching and learning. Otherwise, it may become an additional burden for teachers.

During the interviews, one UNIT of teaching content is used as a sample. Teachers are invited to demonstrate how they utilise these motion graphics in the classroom to assist in their teaching. This process provides insights into how motion graphics can better support instructional practices.

Section 3: Motivation and purpose of the teaching behaviour

As teachers describe their specific methods of using motion graphics, they are also invited to share the motivations and purposes behind each behaviour they describe. Their diverse motivations and purposes for using motion graphics provide valuable insights for designers, enabling them to develop motion graphics that assist teaching from the teacher's intention.

During the interviews, follow-up questions of section 2 are asked, then based on their responses, to encourage deeper reflection. Questions include: 'Based on this approach to teaching, can you share the reasons for using teaching materials or motion graphics in this way?' 'Do you prefer this method?' and 'Is it related to your teaching style?'.

Section 4: Teacher's ideas for motion graphics design

The purpose of section 4 is to understand teachers' assessments of the teaching materials that utilize motion graphics, identify their needs, and collect feedback for improved design. Teachers are invited to evaluate the design of the teaching materials they currently use. The questions include: 'What do you consider to be the most effective aspects of motion graphics in assisting teaching and learning?' and 'How can motion graphics help you address your teaching difficulties?'.

During the evaluation process, teachers are encouraged to comment on the motion graphics in current teaching material and explain how their design influences teaching. They provide feedback on which design features are effective and should be retained in the current design, as well as those that are ineffective or make teaching difficult, which may require redesign. Teachers also express their specific needs for particular design features, such as simplified patterns for motion effects. Additionally, teachers can describe broader requirements, such as incorporating situational presentations or using a situational approach in the overall visual expression.

Section 5: Students' reactions, behaviours and characteristics

Section 5 aims to explore the characteristics of students during the learning process through teachers' descriptions of students' reactions to

motion graphics in class and their learning behaviours. As the primary audience and recipients of the content, students' reactions, corresponding behaviours, and age-specific learning characteristics influence teaching approaches, lesson content design, and the design of motion graphics. Teachers interviewed note that they adjust their teaching approaches based on the characteristics of different cohorts of students. In turn, these teaching approaches directly impact their design needs and use of motion graphics.

During the interviews, teachers are invited to describe students' reactions and behaviours in response to their teaching approaches and the motion graphics used in teaching. For instance, do motion graphics prompt spontaneous questions and answers from students or encourage more active participation in the classroom?

6.2.1.4 Analysis process

As described in Section 5.4, thematic analysis is applied to all interview data in this research. The analysis process of the INSIGHT INTERVIEWS is presented below as an example to illustrate the general procedure used for analysing all the interview data in this research:

1: Familiarising with the dataset

During the interviews, the conversations are conducted in Cantonese, a regional indigenous language, as it is the language most familiar to the teachers. Using Cantonese allows teachers to express themselves more comfortably and share their perspectives in a more personal and authentic manner.

The entire interview is voice-recorded. During the process of transcribing the voice recordings into text files, the analyst becomes more familiar with the dataset, facilitating a deeper understanding of the collected information.

2: Generating initial codes

7 teachers participated in this round of interviews, resulting in a total interview duration of 12 hours. During the first round of coding, a total of 98 initial codes are generated, with approximately 40 codes related per interview

transcription on average. Since coding is conducted across all seven interviews simultaneously, the same codes should appear in multiple interview transcripts.

Codes are generated based on key phrases or short sentences from the dialogue, utilizing semantic analysis. For example, moving shapes and GIFs. Additionally, interpretive codes are created based on the understanding of the teachers' answers and concise summaries of the content. Such as teacher prefers to use PowerPoint and student reactions to familiar content. This combination of semantic and interpretive coding methods helps to avoid fragmentary code creation while maintaining the accuracy of content capture. Because the interviews follow a semi-structured format, as described above, the use of a guiding question framework leads to the codes are relevant to the different interview sections. Below is an example of a segment from the coding process (Figure 15):

Transcription of the interviews (teacher A)	code
Interviewer: What do you think about motion graphics? **Teacher A:** If it were me, I would think of it as, similar to what most teachers think of it as, a ***moving graphic, a moving picture. Some photos that move***, etc. It's like the ***chat emojis*** we use.	Moving pictures Memes emojis
Interviewer: Will you be modifying these motion effects? **Teacher A:** These animations generated using PowerPoint, I think, ***can be interpreted as motion graphics, because visually, they all move***. But animation in the ***production process are very cumbersome***, because it is easy to get these animations wrong, these animations are ***produced in the wrong order***, then you will need to readjust from the constantly.	Difficult for teachers to revise PPTs motion effects
Interviewer: What kind of pictures would you choose to include in your teaching materials? **Teacher A**: If I were to use a realistic picture, I would use a ***scenario or an object that really exists around us***. For example, a picture of a supermarket around us, so that they will ***be excited to see it*** and realise that the word means a supermarket like this one.	Student reactions Teacher's method of selecting elemental material
Interviewer: How would you choose to use a picture or a pattern? **Teacher A**: In fact, the easiest way for students to understand the meaning of a word is to ***give them a corresponding picture***. This is because if I speak the Chinese meaning directly, I will lead to an incoherent use of language in the ELT classroom. So in fact, ***if I give a corresponding picture, they will understand the meaning of the word immediately***.	Teaching approach Benefits of using photographs

Figure 15: Example of a segment from Generating initial codes

3: Generating initial themes

In this phase, similar or overlapping codes are identified and categorised to determine whether they align with a specific theme. These themes are then developed into candidate themes, which should closely tie to the research question and represent critical information. During the process of theme development, some codes may not fit into only one theme. The following provides an example of the candidate themes creation process (Figure 16):

code	Candidate theme
Learning outcome requirements Learning outcomes assessment Reasons for modifying the PowerPoint Reasons why teachers don't revise PPTs	Motivation and purpose of the teaching behaviour
Current Teaching Material Shortcomings Current teaching materials Impact of inappropriate design on lessons Methods of comparing old and new course materials Teacher Feedback on Materials	Comments on current PPTs
Teachers' picture use requirements Teachers' requirements for colours Teachers' sharing of teaching experience Colour Interactive session needed Keeping students' attention Need interesting content Teacher's design ideas Number of interactive sessions Teacher's material selection method Teacher's motion design requirements Teachers' picture use requirements Teachers' requirements for colours	Requirements for motion graphics design
Material from textbook Production of current course materials	Current design of the motion graphics
Characteristics of Year 2 students Learning of students Students' attention is easily disturbed Students' thinking patterns Definition of strong interaction PowerPoint is liked by students Student behaviour in the classroom Students like to tell teachers what they see on PowerPoint Student outcomes and attendance Students enjoy the games Students' needs Students' reactions Student reactions to familiar content Familiar Characters Learning outcomes and student memory Preference for cartoon style Preferred lesson formats	Students' reactions, behaviours and characteristics

Figure 16: Example of a segment from Generating initial themes

4: Developing and reviewing themes

Based on the candidate themes generated above, a further revision is carried out as well as confirming the themes. What needs to be done at this phase is to check again whether the coding is relevant to the theme and whether the dialogue content supports the theme. Repeated themes are merged, or themes that are too broad in the narrative are separated. The following is an example of the theme-building process (Figure 17):

code	Candidate theme	Theme
Learning outcome requirements Learning outcomes assessment Reasons for modifying the PowerPoint Reasons why teachers don't revise PPTs	Motivation and purpose of the teaching behaviour	Motivation and purpose of the teaching behaviour
Current Teaching Material Shortcomings Current teaching materials Impact of inappropriate design on lessons Methods of comparing old and new course materials Teacher Feedback on Materials Teachers' picture use requirements Teachers' requirements for colours Teachers' sharing of teaching experience Colour Interactive session needed Keeping students' attention Need interesting content Teacher's design ideas Number of interactive sessions Teacher's material selection method Teacher's motion design requirements Teachers' picture use requirements Teachers' requirements for colours Material from textbook Production of current course materials	Comments on current PPTs Requirements for motion graphics design Current design of the motion graphics	Teacher's requirements for motion graphics design
Characteristics of Year 2 students Learning of students Students' attention is easily disturbed Students' thinking patterns Definition of strong interaction PowerPoint is liked by students Student behaviour in the classroom Students like to tell teachers what they see on PowerPoint Student outcomes and attendance Students enjoy the games Students' needs Students' reactions Student reactions to familiar content Familiar Characters Learning outcomes and student memory Preference for cartoon style Preferred lesson formats	Students' reactions, behaviours and characteristics	Students' reactions, behaviours and characteristics

Figure 17: Example of a segment from Developing and reviewing themes

5: Refining, defining and naming themes

In this phase, the candidate themes are redefined and named again to avoid the overlap between the themes and check for each of which is supported by sufficient dialogue content. At the same time, referring to the research questions, the themes should be checked to see if they can be related to the questions and if their dialogue can be used as an aid to discuss the answers to questions. The main approach in this phase is to write down the purpose, significance and scope (brief synopsis) of each theme concerning the research question, as exemplified in the analysis of phase 5 below (Figure 18):

Theme	RQ and brief synopsis	Code	Coded extracts
Motivation and purpose of the teaching behaviour	**RQ**: What do students and teachers assess about current educational tools which incorporate motion graphics? **Brief synopsis**: Under this theme, teachers mainly expressed about how they use teaching tools in their teaching, the motivation behind the usage of multimedia tools and the reasons.	***Learning outcomes assessment*** Learning outcome requirements Reasons for modifying the PowerPoint Reasons why teachers don't revise PPTs	***Teacher A:*** *The process assessment is the student's performance in some games.* ***Teacher D:*** *Such games or session are necessary, because this is actually an output, a way to check the student's learning results.* ...
Teacher's requirements for motion graphics design	**RQ**: What do students and teachers assess about current educational tools which incorporate motion graphics? **Brief synopsis**: Collect teachers' requirements for motion graphics, which are various, e.g. in terms of the choice of pictures, interactive session formats, etc. At the same time, the teachers provide their own design ideas.	***Teachers' picture use requirements*** Current Teaching Material Shortcomings Current teaching materials Impact of inappropriate design on lessons Methods of comparing old and new course materials Teacher Feedback on Materials Teachers' requirements for colours Teachers' sharing of teaching experience Colour Interactive session needed Keeping students' attention Need interesting content Teacher's design ideas Number of interactive sessions Teacher's material selection method Teacher's motion design requirements Teachers' picture use requirements Teachers' requirements for colours Material from textbook Production of current course materials	***Teacher C:*** Regarding the use of pictures inside the PPTs, I think as long as the content of the picture matches the text content, it's fine! ***Teacher D:*** On the picture, if it is said that the part on learning some vocabularies can actually be made simpler by directly highlighting the key contents. ***Teacher F:*** Therefore, the fundamental need is actually that the use of pictures or patterns needs to be in accordance with the content of the course. ...
Students' reactions, behaviours and characteristics	**RQ**: What do students and teachers assess about current educational tools which incorporate motion graphics? —To investigate students' reactions for different motion graphics. **Brief synopsis**: This theme is about how teachers and students assess motion graphics and the information obtained from students' responses to motion graphics in the classroom. In addition to the teacher's description of the students' responses in the classroom, students' behaviour in the classroom and students' characteristics are also captured to help better understand the students' needs for motion graphics design.	***Characteristics of Year 2 students*** Learning of students Students' attention is easily disturbed Students' thinking patterns Definition of strong interaction PowerPoint is liked by students Student behaviour in the classroom Students like to tell teachers what they see on PowerPoint Student outcomes and attendance Students enjoy the games Students' needs Students' reactions Student reactions to familiar content Familiar Characters Learning outcomes and student memory Preference for cartoon style Preferred lesson formats	***Teacher A:*** Win the group and get rewarded. In this way, students will be more interested in participating in the course. ***Teacher D:*** Because it will be found that some students, even if they have learnt some words during games or lessons, they will forget them when there is a change of scene or usage, so some sessions actually have to be repeated a few times for them to remember. ***Teacher E:*** If they are in the lower grades, you know, their ability to concentrate is relatively low, a class of 40 minutes, they can pay attention to the teacher for 15 minutes is already very good!

Figure 18: Example of a segment from Refining, defining and naming themes

6: Writing up

This is the last part of this round of analysis, for the summary of the results. Based on the above steps, the themes that answered the research questions and their supporting content can be obtained. The detailed results of the analysis can be found in the next section.

6.2.1.5 Results from the INSIGHT INTERVIEWS

The results of the interviews are presented in two aspects. The first aspect is related to RQ1, the definition of motion graphics in this research. The second aspect is related to RQ2 and 3, the relationship between teachers, students and motion graphics as an educational tool.

Aspect 1: definition of motion graphics in this research

The teacher's understanding of motion graphics

Teachers describe motion graphics through various examples: pictures (Teacher A), shapes (Teacher D), patterns or emojis (Teacher E). Some associate them with motion effects such as automatically played moving images (Teacher E), GIFs (Teacher D), or images containing animated elements (Teacher B). Others equate motion graphics with short video clips (Teacher A), while a few, unfamiliar with the term, speculate that it may relate to trend graphs (Teacher X). From the interviews, it is evident that while teachers do not possess a highly specialised understanding of the concept of motion graphics, they generally interpret it as 'moving patterns' based on the literal meaning of the term. When motion graphics are discussed in the context of instructional materials or tools used in the classroom, they are commonly perceived as animated visual materials presented to students.

The interviews also show that teachers consistently link motion graphics to PowerPoint, which they identify as the main medium for classroom multimedia. PowerPoint presentations, long used in teaching, often integrate animations, embedded videos, and songs, making them the primary carrier and presentation platform for motion graphics in the classroom.

Aspect 2: teachers, students and motion graphics as an educational tool

1: Teaching behaviour

Teachers' opinions on revising motion graphics

Teachers reflected that if they wanted to revise the motion graphics to their specific needs, it would take them a lot of time and effort to adjust the details and formats (Teacher G). In addition, technical difficulties are also a challenge for teachers in creating and revising motion graphics:

- lack of skills to design or edit dynamic effects (Teachers A, B, D, F),
- complicated PowerPoint structures that make changes difficult (Teacher G),
- senior teachers struggling with advanced computer settings (Teacher A). For example, Teacher B notes:

> ‘There is no way we can make these dynamic effects by ourselves (...) it is too complicated to do so.’

The most common way for teachers to make changes is to simply delete the useless PowerPoint slides, as this is the easiest way to revise the motion graphics:

> ‘In fact, I will choose to delete them directly without amending too many details. ’ (Teacher C)
>
> ‘I usually make some deletions, and I’ll choose some parts inside the PowerPoint that I think I can use.’ (Teacher D)
>
> ‘I usually delete slides of PowerPoint and rarely change too much of the content.’ (Teacher F)
>
> ‘I don’t have enough time to completely cover everything on the PowerPoints in class, so I usually remove a section that I don’t think is important or make it simpler.’ (Teacher A)

As the quotes illustrate, teachers simply delete some PowerPoint slides when they find that the content does not align with their lesson plans. Teacher G explains, because the full content of one lesson teaching material is originally created for a 20-minute online course, with the teacher in the video delivering the content continuously and without interacting with students. However, if teachers need to interact with students in the classroom, they may not have enough time to use all the content in the teaching material during the lesson. Despite this, teachers agree that it is better to have excess content in the teaching materials than too little, as it is easier for them to remove content than to add it.

By contrast, teachers with stronger computer skills sometimes modify PowerPoints more extensively, but their focus remains on teaching effectiveness rather than aesthetics. As Teacher G states:

> 'I usually delete images or content that doesn't fit what I want, and I don't care too much about the style of the images.'

These teachers value whether visual elements clearly support instructional goals rather than pattern types, visual effects, or colour schemes (Teacher D). Teachers who modify motion graphics emphasise that even if they design it, they do not have enough time to create graphics. Instead, they search for similar materials online (Teacher F) as long as the materials do not deviate too much from the intended content or style (Teacher G).

Functions of motion graphics in in classroom

Motion graphics is intuitive expression for students and would be easier for them to understand. 'I use pictures when I explain words. For example, when explaining the word "nervous", there might be a human face or an emoji to present, and it will be easier for students to understand.' (Teacher E)

Beyond supporting comprehension, motion graphics also structure teachers' lessons by providing a clear framework for classroom instruction. Teachers rely on PowerPoint slides to organize lesson flow and avoid omissions:

> 'For us, we will put the whole teaching framework of the class on PowerPoint (teaching material), because I teach for 40 minutes, I will forget my teaching steps, I mainly look at the hints on PowerPoint, and then I will remember. It's easy to forget what to do next in a 40-minute class.' (Teacher B)

> 'We usually find out what the textbook is about and then correspond to the PowerPoint (teaching material) to see how to teach the lesson.' (Teacher E)

> 'Usually, I follow the flow of the PowerPoint (teaching material) to teach.' (Teacher F)

Teachers also highlight that motion graphics function as ready-made pedagogical resources that can be adapted to individual teaching styles. As Teacher G notes: 'I can identify if there is a pedagogical approach in the teaching material that I can learn from, or if the teaching framework is compatible with my style. I can simply model the teaching in the PowerPoint for the lesson.' For this purpose, teachers also emphasize that 'the content of the motion graphics must be relevant to the textbook.' (Teacher B)

Motion graphics as a teaching and learning tool

Teachers generally perceive motion graphics as more effective than traditional blackboard writing, as they save time and improve efficiency in both teaching and learning (Teachers D, G). By incorporating pictures and animations, motion graphics provide students with a direct and accessible understanding of word meanings, reducing the need for lengthy explanations (Teacher A). When the teaching content is complex, the teacher would prefer to present by motion graphics so that students would be easier to receive more information in a short period (Teacher G). Motion effects further help capture attention, and repetition in visual supports memory retention (Teacher A).

Within the IIO Teaching Model, teachers frequently apply animations in the input stage, followed by interactive games in the interaction stage (Teacher A). Interactive activities serve two purposes:

- For teachers, they are a way to check learning outcomes, correct misunderstandings, and assess effectiveness (Teacher G).
- For students, they increase participation and engagement in lessons (Teacher A).

However, Teacher F also highlight limitations and risks:

- When cartoon-style themes alternate too frequently with real-life photos, visual inconsistencies arise, which may confuse students and hinder their understanding.
- Although games have an inspiring effect, they may cause students to focus more on the activity itself rather than the content, sometimes leading to excessive excitement and reducing their concentration on learning.
- Sound effects can enhance animation effects, but inappropriate or excessive use, such as loud or sudden sounds, may scare or distract students' attention.

2: Use of teaching material to facilitate interaction and assess student performance

Teachers believe that students' attention in class directly affects their learning outcomes (Teacher E). As lower-grade students do not take paper-based exams to relieve academic pressure, teachers rely on classroom interaction to assess their learning progress. The interactive games embedded in the motion graphics offer a flexible method to assess students' understanding. For example, the

text-picture matching game enables teachers to determine whether students have mastered specific words (Teacher A). By observing students' reactions in these activities, teachers can constantly measure the degree of understanding and adjust their teaching accordingly.

3: Teacher's requirements for motion graphics design

Comments on current teaching material

The teachers interviewed are generally satisfied with the current teaching materials, which they consider to be an effective support for their teaching. 'The design of the sounds and images is attractive to the students' (Teacher E), and the animation makes the lessons more interesting. As a result, students respond better and their concentration improves (Teacher F).

Teaching material includes repetitive teaching sections (Teacher E), such as exercises on word usage and learning sentence patterns, which some teachers describe as 'too robotic in the design of the teaching activities' (Teacher C). Teachers emphasise that if the same content is used in lessons for a long period and repeated too frequently, students lose interest. Teacher E suggests, 'Vocabulary teaching could be designed using different approaches, learning different words in different ways.'

Requirements for visual elements design

Regarding the design properties, the most important task of these visual presentations is to make the key teaching content clear to the students (Teacher F), and 'the text needs to interplay with the visuals' (Teacher C). Teachers indicate that their main criterion for assessing the appropriateness of visual elements is whether they can directly and accurately convey information to students.

In terms of the visual design, the teachers suggested that the visual content should be scenario-based so that it brings a contextualization of the situation to the students (Teacher C):

> 'Before starting the lesson, you can introduce a scenario, for example, when the content of the class is about the words of the place, you can introduce the students to take the bus together and start to visit different places, so as to give the students psychological hints so that the teaching of content will not be too abrupt.'
>
> 'About the construction of the scenario, it is possible to be more visually specific and visualise the content more intuitively, which is consistent with the students' intuitive

thinking patterns, and they will be more likely to understand what is happening in the scenario.'

'I think that the expression of scenarios can be used to make the lesson more immersive and the students more engaged, for example, the bus tour can be created as a scenario through the student's vision, where they are looking out of the window of the bus.'

'I think that's what teaching in scenarios all is about, it's important for students to learn within the scenario, otherwise they're like bystanders.'

Teachers also highlight that scenario-based content should be visually specific and aligned with students' intuitive thinking patterns, possibly enhanced by a storyline led by a recurring character (Teacher C).

Regarding style, teachers recommend using cartoonish patterns, which are easier for students to understand (Teacher B). Motion graphics also function as visual cues in class. These cues can (1) hints of upcoming activities, such as a hand icon prompting clapping with reading, or a 'thumbs-up' indicating correct responses (Teacher A); and (2) remind students of textbook content by reusing familiar visual elements (Teacher B).

Requirements for motion effects design

Teachers emphasise that although motion effects can be effective in capturing students' attention, they should not last too long:

'As long as there is content with sounds and images, it is attractive enough for students.' (Teacher E)

'Motion effects can be used to gain attention at the beginning of the class, but they should stop when important course content is presented. If the motion effect is continuous, students may focus too much on the motion, becoming less interested in what the teacher is saying.' (Teacher C)

Similarly, during vocabulary learning, motion effects should remain simple to avoid distraction (Teacher D) and to make them easier for teachers to manage or adjust (Teacher G).

Teachers also caution against excessive or lengthy use of games. They prefer shorter, varied activities that do not require students to stare at the screen for too long (Teacher S). In addition, they recommend integrating interactive feedback within motion graphics, such as effects triggered by students' actions during games, to sustain motivation and engagement (Teacher D).

Needs for new designs

Teachers note that the design of motion graphics can actively trigger learning activities in class. They suggest incorporating not only new games but also alternative forms of interaction and thought-provoking sessions to sustain student interest (Teachers M, H).

In current materials, each slide includes Notes that explain the content, purpose, and function (Teacher S). However, teachers point out the lack of guidance on how to adjust content or motion effects. Providing practical tips for modification would make the materials more adaptable to different classroom needs (Teacher X).

4: Students' reactions, behaviours and characteristics

Difficulty in concentrating throughout the lesson

According to the teachers, Garde 2 students are difficult to stay focused throughout the entire lesson (Teacher B). 'Garde 2 students can generally stay focused for about 20 minutes' (Teacher D). As the duration of the class increases, fewer students remain focused on the teacher's instruction:

> 'Usually, when I first start a lesson, it must be that the whole class is very focused on following me, but maybe after 10 minutes, some of them will begin not to follow me, and after another 10 minutes, only half of the students may be following my teaching.' (Teacher E)

Teachers infer that the main reason students would be unable to focus is because they look at the screen for long periods and get tired (Teacher E). In addition, the content of the lesson can sometimes be a possible reason why students do not focus on the class (Teacher E):

> 'Students will be less interested in learning natural spelling, they will find it more boring.
>
> 'If there are too many extended exercises on the use of words in the second half of the class, students may feel that the content is too repetitive, or they may think 'I don't want to learn anymore.'
>
> 'However, it is true that some students may not enjoy learning English, and those students are more difficult to keep focused on the classroom.'

Teachers emphasise that sustained concentration depends heavily on teacher guidance. Second-year students are generally willing to follow instructions and imitate the teacher's actions when guided step by step (Teachers F, G):

> 'If students are not engaged in the lesson and act like bystanders, they will be unresponsive and it will feel like a long-running lesson.' (Teacher C)

Teacher B also mentions that because of the young age of the students, it was inevitable that they would be distracted by fatigue in the second half of the class.

Familiarity with the teaching method and flow

Grade 2 students have a certain understanding of the teaching method and flow. When they receive visual cues on motion graphics or follow the teacher's instructions, they know what the next teaching activities will be about (Teacher D). 'Students are also aware of the rules of the lessons' (Teacher G). Therefore, the teacher can spend less time explaining the teaching activities, which contributes to the efficiency of the teaching process (Teacher A), and the students are more cooperative with the teacher's guidance (Teacher D). 'There is increased participation in the classroom in the Grade 2.' (Teacher A) However, at the same time, because the students know the teaching process, teachers comment that students become less motivated: 'Compared to the first year, second-year students have already seen these motion graphics, so they don't get strongly motivated' (Teacher D). Students who are more familiar with visual expressions (e.g., graphics, patterns) and teaching activities in motion graphics (Teacher F) lose their novelty when they see them again. Additionally, Teacher D speculates that because students can easily access a lot of different information through various methods, such as different software on mobile phones, some content displayed on teaching materials might have already been seen, making it difficult to arouse their interest when they encounter it again.

Engaging students with competitive and rewarding activities

To engage students more actively, teachers use games alongside motion graphics, with group competitions being the most common (Teacher C). For example, students compete to see which group answers more questions correctly. At this age, students seek recognition, respect, and a sense of belonging, and they enjoy the desire to win against classmates. Therefore, teachers recommend competitive games and interactive activities to motivate participation (Teacher C).

Reasons for losing attention

Teachers note that students lose focus due to weak self-discipline (Teacher E). They may concentrate on decorative frames or auxiliary elements in motion graphics rather than the main content, or engage in side discussions with classmates (Teachers E, F). Active students often comment on peers' responses, further diverting attention. When this happens, teachers must pause the lesson and use strategies to refocus students, though regaining attention is challenging (Teacher B).

Additionally, students' attention to motion graphics is unpredictable: they may fixate on minor details or interpret visuals in unintended ways, causing them to miss the main content (Teacher E).

Forgetting what is learnt and the need for repetitive teaching

Teachers commented that students at this age could easily forget what they have learnt, e.g. when the scenario in which a word is used changes, they forget the words they have learnt. Therefore, repetitive presentation of content is a common approach used by teachers, which aims to give students a 'deeper impression' (Teacher D), be easier for the students to memorise. The practical approach would be for teachers to keep repeating/keep presenting the same slides. However, the teaching content setting of the Grade 2 already includes repetition, students tend to lose interest and become less engaged in classroom activities (Teacher E).

Preferring lessons with motion graphics

Teachers report that students prefer lessons with motion graphics over textbooks, as the sounds, videos, and games keep them engaged and motivated (Teachers A, G). However, excessive use of motion effects can distract students from the content (Teacher C). Some teachers stress that it should serve as a support tool rather than dominate the lesson (Teacher G).

Using games in lessons

Classroom games can be categorised into three types:

- Teacher-student games without motion graphics, such as ‘reading aloud in a train’ to spark interest.
- Interactive games integrated into motion graphics, e.g., Spin the Wheel or Word Match Text, provide visual feedback.
- Teacher-student interactions that use motion graphics for presentation, such as role-playing with lines displayed on slides, without requiring motion graphics to give feedback.

Teachers note that while games are engaging and help capture students’ attention, overly complex interactions can confuse younger students, and fatigue may reduce engagement as the game progresses (Teachers A, E).

Responding to familiar and unfamiliar content

Teachers indicate that students respond more positively and learn more quickly when engaging with familiar content that interest them. For instance, students react more actively to content featuring scenarios drawn from their own surroundings (Teacher A), while they are less responsive to unfamiliar content:

> ‘When something they recognize appears, they are more excited and more conscientious.’ (Teachers E)
>
> ‘First and second-grade students are only willing to learn if they are interested.’ (Teachers A)
>
> ‘In the classroom, they are interested in patterns that they may have seen before, or music that they may have heard before, they will think of them and then they will be more interested, and sometimes they will say to me, “I have seen or heard this before”, like that.’ (Teachers C)
>
> ‘If something comes up in the PowerPoint that they recognize. For example, if the word has not come out yet and just a picture appears, say the lesson is about food, and I put a picture of a hamburger, they get excited.’ (Teachers E)
>
> ‘Most students, in fact, will be more familiar with colours or food, but if it’s transport, or some of the location words, they use less of those words, it may take a little bit more time for them to learn.’ (Teachers D)
>
> ‘But if they see something they don’t recognize, such as a boy character they don’t know suddenly appearing, then they certainly won’t have much of a reaction.’ (Teachers E)

The reason for their weaker response to unfamiliar content, or to answering more difficult questions, ‘is because they are worrying about they will answer incorrectly.’ (Teacher A)

Preferences for visual expression
Students are drawn to colourful visual elements (Teacher F) and process information from images faster than from text. Teachers suggest that picture displays should be used more frequently than text in teaching PowerPoint for lower-grade students (Teacher C).

6.2.1.6 Summary

Aspect 1: definition of motion graphics in this research

Motion graphics and PowerPoint
Teachers interpret motion graphics inconsistently, often taking the term literally as ‘moving patterns’ and associating it closely with PowerPoint as the primary medium for presenting visual materials in the classroom.

Aspect 2: teachers, students and motion graphics as an educational tool
The above interview results are further integrated and summarised to distil the following core findings, which is presented under separate themes.

1. Motion graphics design, lesson flow and attention
According to the results of the INSIGHT INTERVIEWS, during classes, students have difficulty in keeping focus during long periods (15-20 minutes in a 40-minute lesson). The reasons behind this are diverse, according to the teachers, as class time progresses, students may gradually lose focus due to physical or mental fatigue. In addition, prolonged screen time can lead to eye strain, which affects the overall learning experience.

According to teachers’ feedback, guidance from teachers is considered one of the key factors that influence student attention. Students usually tend to follow and respond to the teacher’s instructions, so the teacher’s guidance plays a positive role in helping students refocus and increase their participation.

Furthermore, in terms of the relationship between motion graphics design and

teaching flow in class, as the main focus of this research, teachers mention that during the initial stage of the lesson, namely, the 'input section' of the IIO teaching model, they tend to use animations or video clips as instructional materials. These multimedia formats stimulate student interest, quickly arouse attention, and help students get into the learning state faster.

However, when the lesson moves into the instructions of new knowledge (which also belongs to the input section), teachers usually suggest reducing or even pausing the use of motion graphics. Although motion graphics have the advantage of engaging students and enhancing focus, overly motion visual effects may distract students from core content, causing them to focus more on the visuals than on what the teacher is explaining. Therefore, the design and use of motion graphics should align with instructional goals to avoid diverting student attention and to ensure teaching remains purposeful.

After new knowledge is introduced, the lesson proceeds to the 'internalisation section' of the IIO model. In this section, the teaching purpose shifts to student practice and reinforcement, mainly through problem-based teaching strategies. Teachers generally recommend incorporating a variety of interactive activities, such as games, to enhance student engagement and motivation.

In terms of motion graphics design, teachers generally encourage the adoption of more new methods of interaction and visual expression. In particular, games that include competition can significantly enhance students' interest. Teachers emphasise that if motion graphic can respond to student actions (even if pre-programmed), it tends to elicit more active participation and improve the effectiveness of interactions. Moreover, moving and entertaining visual expressions, especially those using familiar content, such as previously learned knowledge or popular cartoon characters, often provoke a more positive learning response. During this section, the use of motion graphics can be more flexible and diverse, with richer motion effects to enhance classroom engagement and interaction.

Teachers also stress that if the motion effects or visual elements are not closely related to the teaching objectives, they may attract students' attention to irrelevant details and spark off-topic discussions. Additionally, motion effects that are too long or repetitive, overly complex interactive processes may distract students and weaken students' attention on essential knowledge.

Regarding the form of learning outcome assessment, teachers state that they mainly rely on observing students' responses and behaviours during interactive activities. This evaluation process spans both the internalisation section and the output section of the IIO teaching model. Therefore, motion graphics should support interactive activities still to be seen as an effective and recommended instructional strategy.

2. Scenario-based visual expression

Teaching in scenarios is one of the key instructional strategies in English language classrooms. Teachers consistently emphasise that incorporating contextually rich elements into the visual design of motion graphics can effectively enhance students' understanding of vocabulary meanings and their application in real-life scenarios.

3. Graphics and photos in visual expression

In classroom teaching, teachers generally believe that visual materials such as graphics and photos are more effective than textual content in capturing students' attention. Most teachers prefer to use graphics as the primary form of visual expression, especially those with cartoonish and child-friendly designs, as these are more likely to engage students. Such graphics not only align with children's aesthetic preferences but also help convey the teaching content in a more entertaining and engaging way. However, in certain teaching materials, teachers also use photos as supplementary materials. There are typically two main reasons for using photos: first, when graphics fail to effectively convey the intended content, photos provide more concrete and realistic support; second, when suitable graphics are unavailable, for example, they cannot find graphics online that they can use directly, or the teaching materials they receive do not provide the suitable content, photos serve as a practical alternative. This is particularly effective when presenting scenes familiar to students, such as well-known local places, which can evoke a sense of connection and increase receptiveness to the lesson.

Although both graphics and photos offer specific instructional advantages, teachers point out that either type of visual expression may also divert students' attention to irrelevant details. For instance, students might become absorbed in minor elements within the image and stray from the learning task. Teachers emphasize that students' attention distribution is somewhat unpredictable, and this needs to be considered when designing and selecting visual materials.

In addition, teachers believe that alternating between graphics and photos can enhance the visual variety of a lesson. However, frequent mixing or random switching between the two should be avoided. Excessive blending may cause visual interference, leading to cognitive confusion and negatively affecting students' comprehension and absorption of the teaching content.

4. Teachers modifying motion graphics

Teachers express a clear need to adjust motion graphics according to their specific teaching contexts. However, the complexity of modification lowers their willingness to make such changes. For teachers who are less proficient in editing PowerPoint, modifying motion graphics often requires a significant investment of time and effort. Additionally, errors during the editing process may result in file corruption, making the teaching material even more difficult to use. The limited availability of editable materials and resources also poses a challenge, as teachers often struggle to find suitable content for replacement or customisation. To save time and stay focused on teaching, many teachers choose to either ignore the need for modification or delete inappropriate content altogether if it proves too difficult to revise. As a result, providing clear, accessible instructions for modifying motion graphics becomes essential in supporting teachers' efficient and effective use of digital teaching materials.

According to the teachers, the current teaching materials include corresponding 'notes' in the PowerPoint slides. However, these notes lack specific instructions that support teachers in modifying motion graphics.

5. Visual cues and visual consistency

Teachers believe that familiar graphic elements can serve as effective visual cues in classroom teaching, helping students quickly understand the lesson flow and upcoming learning activities. When students are repeatedly exposed to and become familiar with specific images or visual symbols, they tend to respond automatically upon seeing them, for example, by engaging in interaction or completing a designated learning task. If such visual cues maintain consistent placement and function across different teaching sections, they form a common design pattern that enhances their signalling function and improves teaching efficiency. This reflects that the visual consistency in motion graphics has a positive effect on the learning process of the students. In addition, teachers point out that many students often forget previously learned content or fail to recall the specific steps of interactive activities. Therefore, the repeated presentation of key content or the consistent use of visual elements

in instructional design, which is found in the ‘internalisation section’, not only guides students but also acts as a reinforcement mechanism that aids memory retention and strengthens knowledge acquisition.

Another common form of visual cue involves using material from the textbook. Teachers state that, when possible, they prioritise incorporating textbook visual materials, such as illustrations or patterns, into their teaching materials. These visuals act as cognitive bridges, helping students recognise the alignment between classroom instruction and textbook content, thereby enhancing cognitive coherence. Moreover, using textbook images can also reduce the workload for teachers when selecting appropriate visual materials, especially in contexts with limited design resources.

6. Intuitiveness of visual expression

In classroom instruction for Grade 2 students, the intuitiveness and clarity of visual expression are strongly regarded by teachers as essential. Teachers note that students in this age group are more inclined to understand and receive information through intuitive means due to their cognitive development stage. Therefore, classroom content should be presented in a direct and clear visual manner to reduce students’ cognitive load when interpreting information and to enhance their comprehension and interest. In contrast, complex or unclear visual representations often increase the difficulty of understanding and may even lead to resistance or a loss of interest in the lesson content.

7. The impact of familiarity

Teachers observe that students respond differently to familiar and unfamiliar instructional content and visual elements. When presented with familiar content, students typically show more positive learning responses due to their existing knowledge base and prior understanding. The reappearance of such content in the classroom often increases students’ confidence and engagement, enhancing their participation in learning activities. Similarly, teachers note that familiar visual elements, such as well-known character images, patterns, or previously introduced visual cues, are more likely to capture students’ attention and interest. However, teachers also state that excessive repetition of familiar content, whether belongs to teaching content or visual materials, may lead to a decline in student interest due to the loss of novelty. Therefore, instructional design should regulate the frequency of familiar content to prevent monotony or mechanical learning experiences.

In contrast, when encountering unfamiliar content, students generally require more time to understand and internalize new information. Exposed to new or more challenging knowledge, some students may hesitate to participate out of fear of making mistakes, resulting in reduced classroom engagement. However, teachers highlight that unfamiliar visual elements can have a positive impact. Novel graphics design may introduce a sense of freshness to the classroom and stimulate students' curiosity and desire to explore. With guidance and encouragement from the teacher, moderate visual innovation can enhance students' motivation to learn. Teachers emphasise that all visual elements must be closely aligned with the instructional goals. Introducing too many decorative or unrelated visuals may distract students and undermine the effectiveness of the lesson.

8. Colour in motion graphics design

Although students may not consciously focus on the logic or consistency of colour schemes during class, teachers have observed through practice that students tend to respond more positively to visuals that are colourful and highly saturated. Vivid colours can attract students' attention, evoke emotional responses, and increase the fun and appeal of the lesson.

9. The impact of sound in motion graphics

Most teachers support the positive role of sound in teaching material, its use can enhance students' learning experience, help maintain attention, and support comprehension of instructional content. However, teachers also emphasise that the effectiveness of sound largely depends on how, when, and in what context it is used. In practice, teachers observe that voice narration can sometimes sound too mechanical, lacking intonation and emotional expression. As a result, it may cause student fatigue and fail to stimulate interest in learning. In contrast, engaging sound effects or background sounds can be effective in disturbing scenarios. For example, imitated natural sounds, personified character voices, or sound-based feedback related to learning tasks may arouse students' attention, and are particularly effective in increasing the participation of lower-grade students.

6.2.2 Part 2: VISUAL ANALYSIS of current teaching materials

The teachers interviewed indicate that the current motion graphics teaching materials are being produced by the teachers within the teaching and research

team. As a result, the design of the motion graphics is basically meeting the teachers' needs. However, based on the interviews, it is evident that teachers still have varying needs and comments regarding the current design of motion graphics. Teachers tend to be subjective in their design ideas and have individual requirements for using motion graphics teaching materials, depending on the students they are teaching.

In Part 2, a visual analysis of the current motion graphics teaching material is being conducted from a design perspective to understand how the existing motion graphics respond to teachers and students' needs through design.

6.2.2.1 Analytical material

The material for this visual analysis consists of supplementary teaching materials for Grade 2 that currently used in schools. These supplementary materials, provided in the form of PowerPoint presentations, support the nine-year compulsory education textbook English Speaking from Guangzhou City, China. They are collaboratively developed by teaching and research staff from several public primary schools in Guangzhou City. Originally, these materials were created to record online lessons during the COVID-19 pandemic. Following the return to in-person classroom teaching, they have continued to be used and have become one of the most widely adopted digital learning resources in primary schools throughout Guangzhou City.

6.2.2.2 Process of visual analysis

Categories of design property

For the purpose of visual analysis mentioned above, based on Compositional Interpretation analysis principles and guidance, the different design properties in motion graphics need to be explicitly categorised for the context of this research. This classification is developed through discussions within the matrix of motion graphics design properties outlined in Section 2.3.4 and Section 2.5, as well as the conceptual descriptions of motion graphics design elements form Crook and Beare (2017) (Figure 19) :

> The term 'Graphic design' under General design properties discussed in Section 2.3.4 overlaps with the 'Graphic design' described in Section 2.5.1, as both refer to various forms of graphics, including 2D, 3D, and

mixed graphics. Moreover, the Fundamental properties of motion graphics outlined in Section 2.3.4 incorporate a range of visual expressions that extend beyond graphics. These visual expressions and different types of graphics can be categorised under the broader concept of ‘The image’ (Crook and Beare, 2017), which encompasses all the expression and elements in visual.

The ‘Motion design’ discussed in Section 2.5.2 refers to the different formats of motion effects applied to various elements within motion graphics. This overlaps with the concept of ‘Space’ (Crook and Beare, 2017). This category of design properties describes the diverse motion effects that can be achieved through visual elements in motion graphics, including deformation, movement within two-dimensional planes and three-dimensional spaces, as well as transformations in texture.

The existence of motion effects inherently implies the existence of display time. Therefore, there is an overlap between the concept of ‘Design of Time’ discussed in the ‘Current Design of Motion Graphics’ (Section 2.5) and the concept of ‘Time’ (Crook and Beare, 2017). Together, these form a category of design property that describes the temporal aspects of motion graphics, including the duration for which dynamic effects are maintained, as well as the start and end points of the motion.

Mentions of sound elements appear in both the ‘General Design Properties’ and the ‘Promoted Properties’ under the ‘Fundamental Properties of Motion Graphics’ (Section 2.3.4), which overlap with the concept of ‘Sound’ description by Crook and Beare (2017). This category defines all aspects of sound expression in motion graphics, including sync sound, automatic dialogue replacement (ADR), foley, and music production.

In addition, the design property of interactive design is discussed under the ‘Promoted Properties’ in the ‘Fundamental Properties of Motion Graphics’ (Section 2.3.4). This constitutes a distinct category that describes how motion graphics can be integrated with specialized display platforms to incorporate interactive elements, thereby providing viewers with an interactive experience.

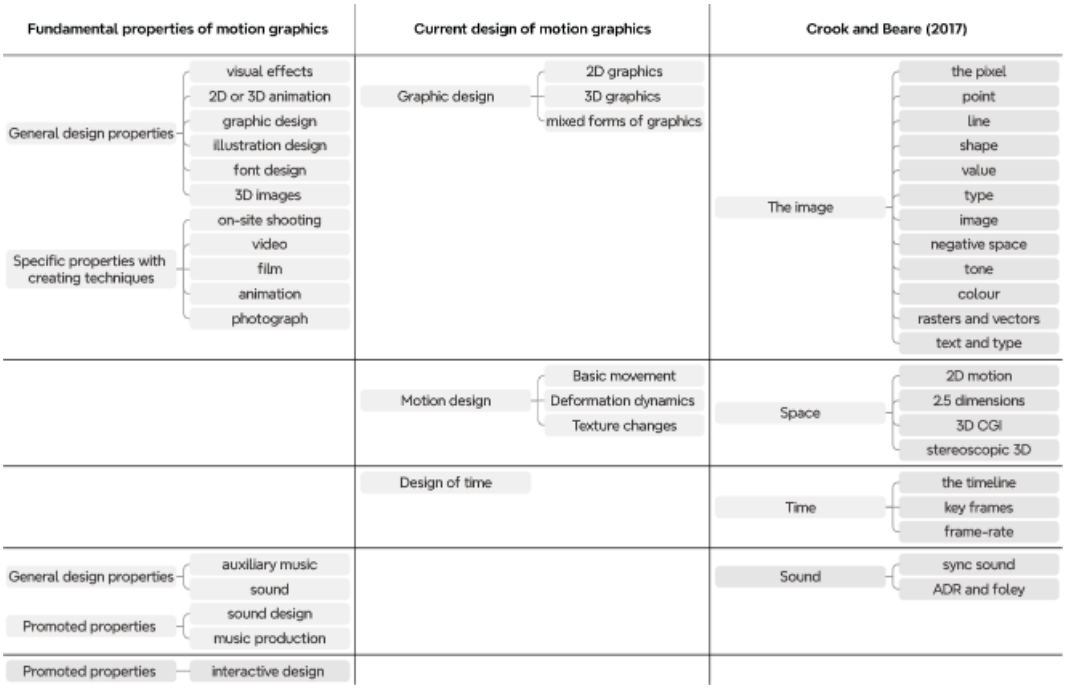


Figure 19: Discussions of motion graphics design properties

Based on the above categorization of design properties, a matrix of general design properties in motion graphics is developed for further discussion. Within the basic design properties of motion graphics, five main categories can be identified: (1) **The image**, which encompasses all visual expression elements in motion graphics; (2) **Motion design**, which refers to the various motion effects applied to visual elements; (3) **Time design**, which involves the design of the display duration and timing of motion content; (4) **Sound**, which includes all auditory elements used in motion graphics; and (5) **Interactive design**, which describes how motion graphics can be designed to provide an interactive experience for the viewer when needed or supported by the display platform.

In the specific context of this research, motion graphics are applied within classroom teaching, where they are primarily presented through PowerPoint (analytical material). Since the categorisation and analysis of design properties are intended to support the development of practical design effects, various elements with the current teaching materials (analytical material) should be categorised based on the concepts of the different design property categories mentioned above. This categorisation identifies the types of design properties and the corresponding concepts that are being focused on within this research:

1. The image

2D Graphics

2D graphics categorized as ‘Simple geometric shapes’ (Figure 20) and ‘Illustrations’ (Figure 21) are found in the current PowerPoint material. It consists mainly of plane shapes made up of the most basic elements: point, line, and shape, which can be flat graphics and illustrations.

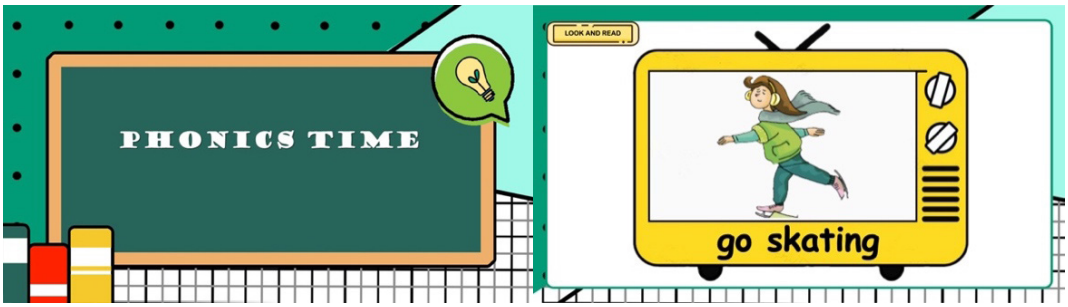


Figure 20: Simple geometric shapes formed by point, line, and shape

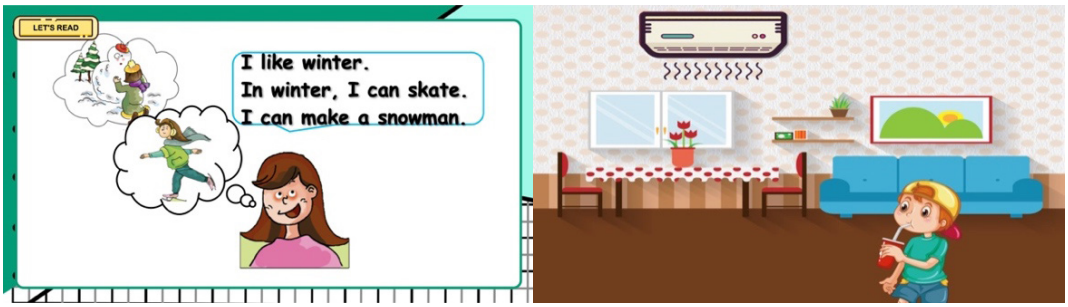


Figure 21: Illustrations

3D Graphics

Graphics in PowerPoint that are generated by 3D modelling software to accentuate the spatial expression and give the viewer a realistic impression are classified as 3D graphics (Figure 22).



Figure 22: 3D models rendered graphics

Mixed forms of graphics

When 2D graphics and 3D graphics appear on the screen at the same time in PowerPoint, they are a mixture of graphics types (Figure 23).

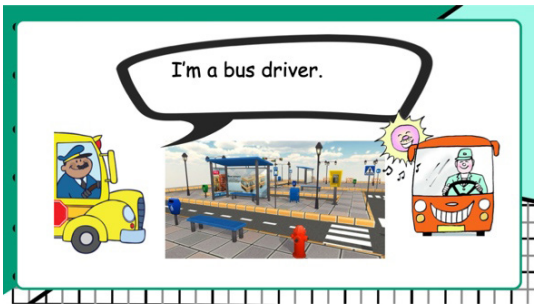


Figure 23: Mixed forms of graphics

Text

Textual content is an important method that conveys information in the current teaching material. When text is required, how it is presented visually is referred to as 'type'. The text is the linguistic content of the collection of words (Crook and Beare, 2017) (Figure 24).



Figure 24: Text

Animation

The current teaching materials are containing animations, which, compared to motion graphics, usually include a storyline and exclusive sound effects. The form of animation appearing in PowerPoint is typically a completed animation video or a fragment of a video that is being integrated into the overall motion graphics as a complete media material (Figure 25).

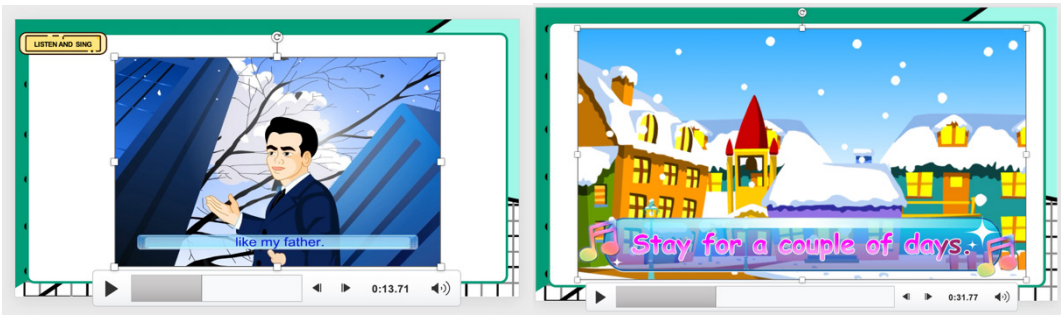


Figure 25: Animations

Photograph

Photographs appearing in the motion graphics referring to pictures being created by capturing images of physical objects (scenario, items, people) (Figure 26). Regardless of the source, whether captured by the teacher (teaching material creators themselves) or downloaded from the Internet.



Figure 26: Photographs

Footages

In addition to the animations, the teaching material also contains videos that are made from different types of footage, such as shooting videos, and news captured from TV (Figure 27).



Figure 27: Footages

Material from the textbook

One type of visual element used in the current teaching materials is directly sourced from the corresponding textbooks (Figure 28).



Figure 28: Material from the textbook

Colour

In motion graphics within educational PowerPoint, ‘colour’ refers to the overall colour scheme and tone of the visual composition.

2. Motion design

In the existing teaching materials, the motion design in motion graphics mainly uses the motion effects provided by PowerPoint, specifically by using PowerPoint’s built-in ‘Animation’ tool (Figure 29).

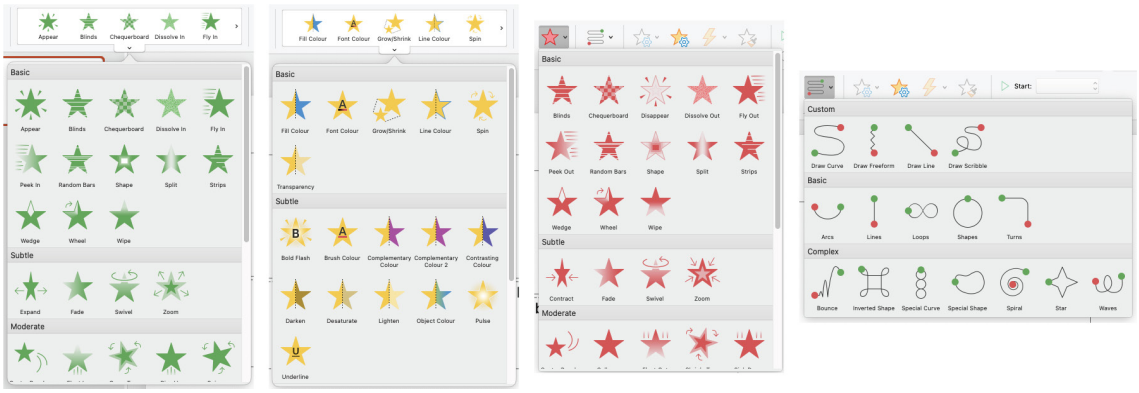


Figure 29: ‘Animation’ tool in PowerPoint

3. Time design

In the current teaching materials, PowerPoint serves as both the production and presentation tool for motion graphics. The design of time is achieved through PowerPoint’s control functions for motion effects. Specifically, the ‘Animation

Pane' tool allows for the adjustment of motion effects 'timing', including how the effect starts, its duration, delay, and repetition. In addition, the tool provides options for setting 'triggers' for motion effects, such as sequential triggering or designating a specific visual element as a trigger (Figure 30).

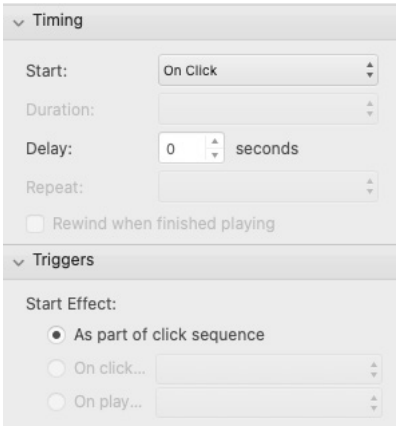


Figure 30: 'Animation Pane' tool in PowerPoint

4. Interactive design

In the current teaching material, the interaction design in motion graphics takes various forms:

1) In the Q&A form, the teacher guides students by asking questions that appear in the motion graphics. Students answer orally, and then the teacher controls the motion graphics to show the correct answer (Figure 31).

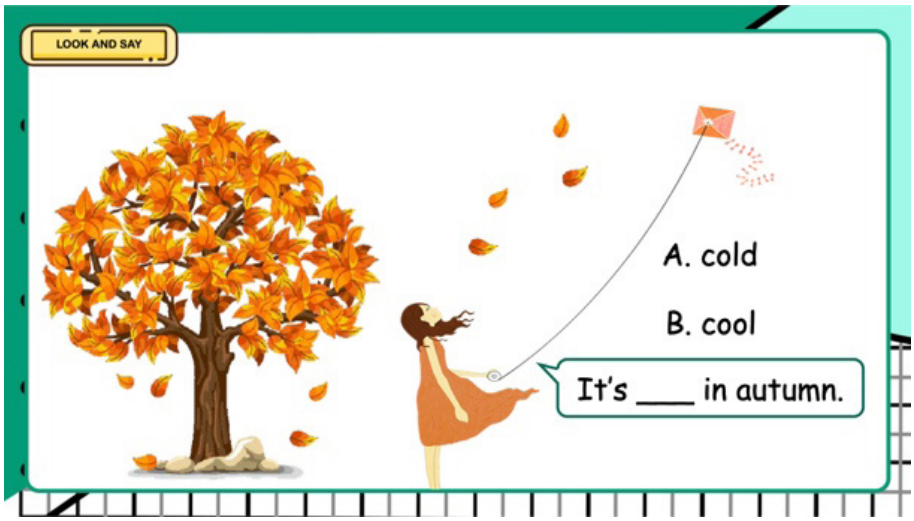


Figure 31: Q&A interaction

2) Different forms of games, such as asking students to read words aloud to help a character in the game cross a bridge (Figure 32).

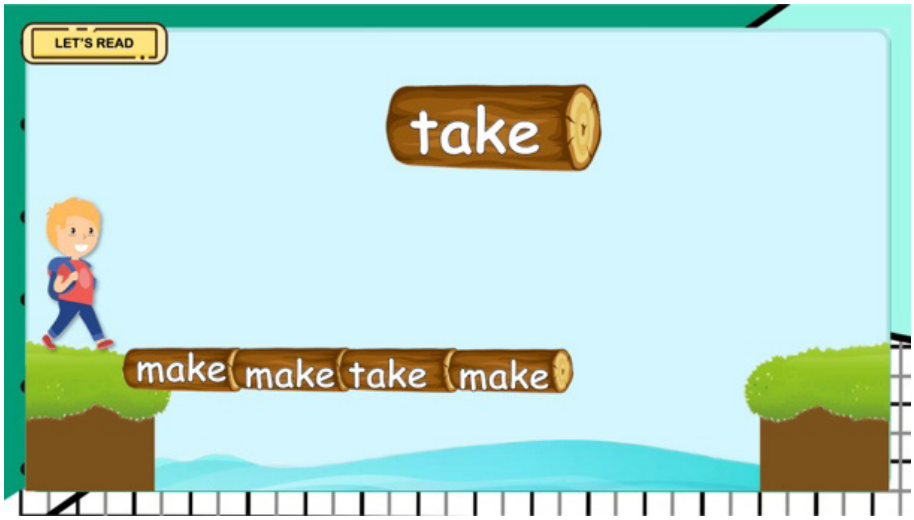


Figure 32: Character in the game crosses a bridge

3) Different picture-word matching forms, guiding students to choose the picture that corresponds to the word, helping them understand its meaning (Figure 33).

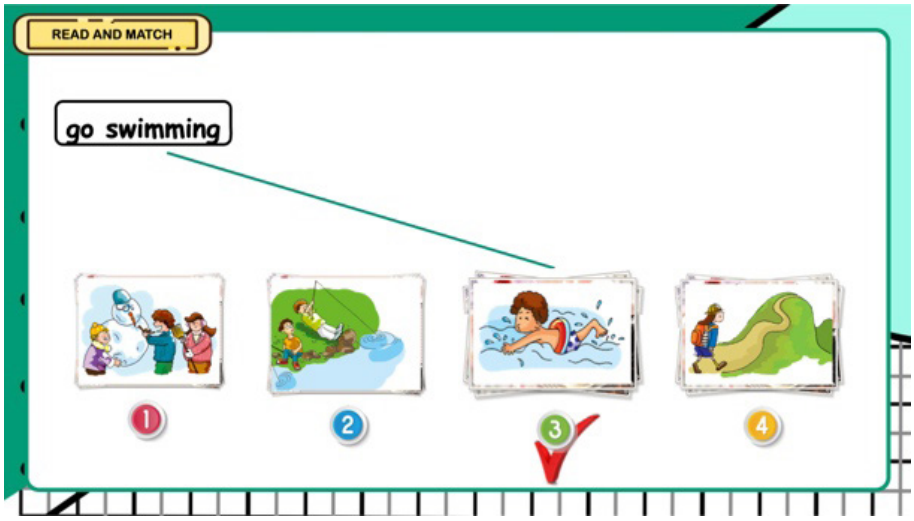


Figure 33: Picture-word matching

4) Role-play reading, based on the characters and dialogues shown in the motion graphics, students assigning roles and reading aloud accordingly (Figure 34).

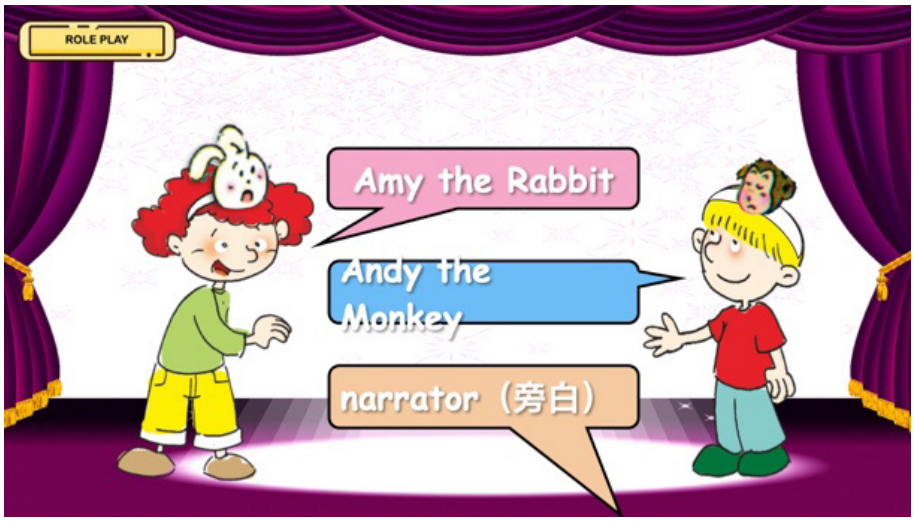


Figure 34: Role-play reading in PowerPoint

5. Sound

The sounds present in current teaching materials consist of 2 main types: 1) recorded human speech, which is usually found in English pronunciation demonstrations, activities with songs and content reading sessions; 2) non-human sound effects, such as the sound of ‘pages turning’ or ‘water dropping’, and background music for interactive activities.

Selective visual analysis of design properties

Based on the summary in section 6.2.1.7, the follow-up visual analysis focuses on the related design properties. Below are the themes extracted from the interviews and their corresponding design properties:

INSIGHT INTERVIEWS result	Corresponding design properties
1. Motion graphics design, lesson flow and attention	• Animation • Motion design • Time design • Interactive design
3. Graphics and photos in visual expression	• Graphic • Photograph
5. Visual cues and visual consistency	• Graphic • Text • Material from textbook
8. Colour in motion graphics design	• Colour
9. The impact of sound in motion graphics	• Sound

2, 4, 6, and 7 are not associated with any specific design properties.

Specific visual analysis actions for different design properties

Graphics (2D, 3D graphics and mixed graphics)
This section focused on ‘graphics’ in design elements. As stated by the interviewed teachers, the types of visual expressions used in the PowerPoint should not be changed too often to prevent confusion of the content. Therefore, among the various types of graphics, it is necessary to know the dominant graphics style in the current motion graphics, which can advise the designer about the main visual expression of the pedagogical content.

Since these teaching materials contain various display effects, that is, it may be necessary for the teacher to manually click, and the contents appear according to the clicking operation. It means one page of PowerPoint may contain multiple changing steps in visual. Therefore, two display states of the PowerPoint as ‘pages’ and ‘scenes’ are defined in this analysis. When the presenter clicks the ‘slide show’ button, the PowerPoint enter the show mode. In this mode, any changes in the overall screen caused by changes in the components are defined as one ‘scene’ (Figure 35), whether it is autoplay or the teacher’s operation that prompted the changes. The definition of ‘pages’ is each slide when the PowerPoint is in the non-showing, editing mode (Figure 36). The difference between the two is that when the producer designed the appearance order of the components or elements, in the editing mode, some components or elements may be out of the visual realm.

Each scene is categorised according to the visual elements it contains. The number of scenes under each categorise is calculated as a percentage of the total number of scenes, to tell the proportion of different design elements to be used.



Figure 35: Scenes in ‘slide show’ mode

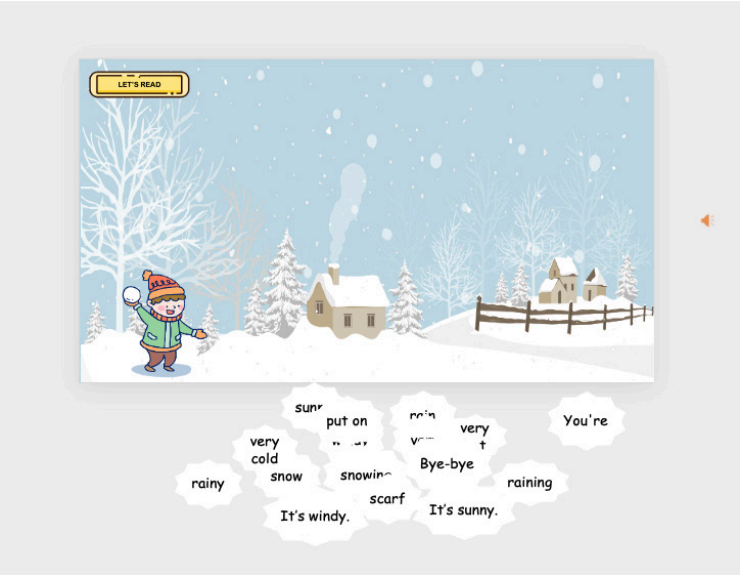


Figure 36: Pages in editing mode

Each scene is categorised according to the visual elements it contains. The number of scenes under each categorise is calculated as a percentage of the total number of scenes, to tell the proportion of different design elements to be used. To determine the main types of graphics, i.e., the ones with the largest proportion in use.

Text

Regarding the analysis of text in motion graphics, the focus is on the design factors that affect the effectiveness of information communication through text. This includes two main aspects: (1) Typography, which refers to the design choices for the size, colour, and position of the letterforms within the visual composition; and (2) Fonts, which refer to the screen display of the typeface. A typeface is defined as the design of an alphabet of letterforms and describes the appearance.

Typography

Text size: in the current teaching material, the range of font sizes used to present text in PowerPoint, the different font sizes and their corresponding functional categories (e.g., title, subtitle, body)

Text colour: the usage of colour expression of words, the relationship between the use of colour and the functional categories of text.

Text Position: The analysis of text position focuses on the relationship between the placement of text on the screen and its effectiveness in supporting the intended communication of information. Within motion graphics presented through PowerPoint slides, text exists within the visible frame together with other visual design properties. Therefore, whether the placement of text is appropriate cannot be judged in isolation; it must be considered as part of the overall layout of the slide. This means that the positioning of text should be analysed in relation to other elements to ensure coherence, clarity, and visual hierarchy. Consequently, the analysis of text position must be expanded into an examination of the overall slide layout, assessing how the arrangement of all visual design prototypes (The image) works together to facilitate understanding. The following are criteria for analysis, referring to Kuba (2021)'s guidelines on the design of PowerPoint as a carrier for the presentation of teaching:

Framing: The level to which elements of typography are related or unrelated to each other. It can be analysed from two perspectives: 1) The placement of the text, which contains the variables of spatial orientation, distance and movement. According to Kuba (2021), this can be considered as spatial contiguity, the principle of proximity stated is that elements close to each other are expected to be related, and connected, and elements far away from each other are perceived as unconnected. Effective text placement is intended to create a correct visual information structure based on the specific message of the content and its placement to achieve communication. 2) The design features of text. By using the principle of repetition, or the principle of similarity, of colours, font types or sizes, brightness and shapes, the text with similar characteristics are considered to be related, while without the similarity are considered to be irrelevant and unconnected (Lauer and Pentak, 2012, Williams, 2015). Repeated use of the colours, graphic elements and iconography can signal elements with the same function and hierarchy, thus reinforcing the overall visual and content structure.

Salience: the level to which different elements attract the attention of the viewer. Attractiveness affects the reading process of the viewer, which can be interpreted as different levels in the visual hierarchy. With more attractive elements being more prominent in the visual hierarchy. Referring to Faraday (2000)'s research on the visual hierarchy composed of different elements in web page reading, the process of information capture possesses two phases according to the priority of different perceptual elements: first 'search' and then 'scan':

Search: the entry point where start to pay attention.

Ordering of perceptual elements for attention-catching, from high attractiveness to low: Motion, Size, Images, Colour, Text style, Position.

Scanning: start scanning the content of the area from the entry point.

Area: area establishes hierarchy through distinction, and the scale of importance is formed by intervening steps from foreground to background. Grouping or placing elements in close proximity to each other provides information about their relationship (Fleming, 1997). Components with the same colour are often considered to be interrelated.

Proximity & reading order: individual components are more strongly associated with neighbouring than distant components. Nearby components may be grouped together; such groupings will follow a left-to-right, top-to-bottom reading order. ‘Placement or position can suggest the relative importance or sequence in which we are meant to digest them’, as Fleming (1997) notes.

Information value: according to the Arnheim (1983)’s claim of the ‘centric’ and ‘eccentric’ layouts (Djonov and Van Leeuwen, 2013), in the centric composition, the content of the surrounding elements is subordinate or subsidiary to the content of the centre, and when some of the surrounding components are equidistant from the centre, this is also expressed as their equal value. In eccentric structures, according to Kress and Van Leeuwen (2020), the top component of the vertical distinction is usually placed to represent the ideal, i.e. the more general and ideal message, while the bottom component is more representative of the reality, the more concrete message. Horizontal distinctions can be easy to interpret in terms of the viewer’s reading experience in a landscape page PowerPoint. A left-to-right reading and writing culture is likely to consider the component and content on the left as ‘established’, known and common sense, while the content on the right can be seen as ‘new’, perhaps problematic, controversial and unexpected.

By analysing the existing teaching materials from these three aspects, it is possible to identify whether any aspect is insufficiently considered or overlooked in the current design. The result provides targeted insights for the design guidelines proposed in this research, supporting that future designs consciously address and improve these issues.

Fonts: the typeface used in the current teaching material

Animation

The current teaching materials contain animations, which, compared to motion graphics, come with a storyline and exclusive sound effects. Since animations as part of the teaching materials, how they achieve teaching effects, how they are compatible with teachers' teaching activities, and how teachers use these animations to teach in the classroom would be the insights that need to be gained from the perspective of design. The analysis focuses on the method and purpose of using animation in lessons.

In the analysis, the information would be listed according to the following categories of analysis of the animations from the analytical material: 1) the number of animations used in each lesson in different units; 2) the durations of each animation; 4) the different lesson session in which the animations are applied; 5) the purpose for which the different animations are used (Figure 37 for sample categories of analyses and information).



Figure 37: Analysing categories and information for Year 2 Semester 2 Unit 5

Photograph

When analysing the current teaching material, it is necessary to separately collect and organise slides that contain photos. The analysis focuses on: 1) the functionality of the photos: identifying the role the photos play on the page; 2) the contextual conditions for using photos: summarising the types of content presentation where photos are usually used. Through this analysis, it becomes clear when it is more appropriate to use photos and how to use them effectively to support teaching.

Material from the textbook

Based on the results of the interviews, materials from textbooks are needed

to be used in PowerPoint, as well as are indeed used more often at current. The analysis focuses on how these materials from books are used in motion graphics, as well as the purposes and functions of different uses.

Colour

As above (Section 6.2.1), the interviewed teachers do not express particular requests or habits regarding specific colour use. Therefore, the visual analysis of colour design in the current teaching materials focused on determining whether specific colour usage patterns exist. This analysis adopts Rose (2022)'s critical visual methodology, particularly 'the compositionality of the image itself'. Rose (2022) highlights that 'colour' in visual analysis, as a core element of image composition, not only describes colour itself, but is also necessary to describe the functions of the colour. This analysis of colour usage essentially aims to explore whether there are specific and recurring patterns in the current teaching materials, and whether these patterns play a role in the teaching process, and if so, what kind of role they serve.

Step 1: the researcher conducted an overall direct review of the sample materials by examining and comparing the PowerPoint slides of each lesson. Example shows: A comparison of the 5 sets of PowerPoint slides corresponding to the 5 lessons (periods) in UNIT 1, Semester 2 (Figure 38).

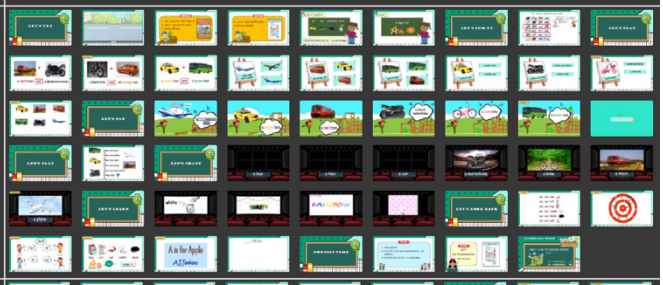
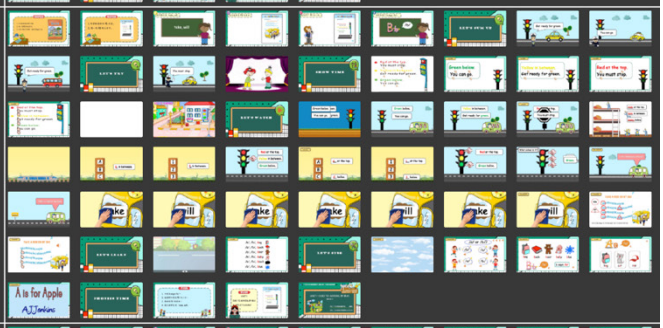
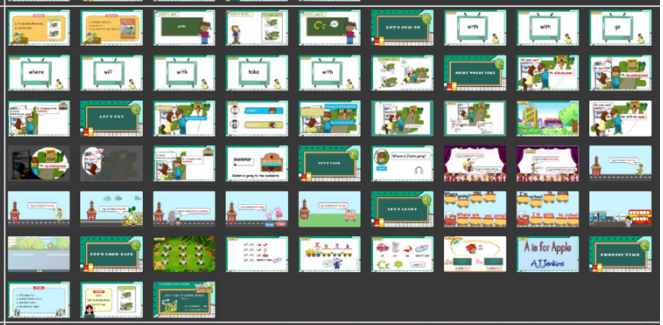
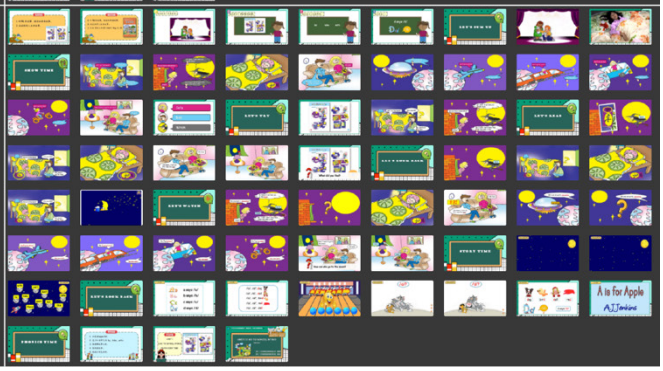
Lesson	Overview of slides
1	
2	
3	
4	
5	

Figure 38: 5 lesson sets of PowerPoint slides

Step 2: to further analyse the colours used in the slides, Step 2 applies a Colour Clusters comparison method. This method employs a Colour Clusters generation tool, treating each slide as a complete visual unit for cluster extraction. This step aims to compare whether the Colour Clusters across different slides demonstrate visual similarity and continuity, which may indicate the presence of specific colour usage patterns.

The analysis employs the Image Colour Summariser, developed by Martin Krzywinski, which generates Colour Clusters for each slide. In this analysis, the number of Colour Clusters is set to eight (k-means=8).

Example shows: A random selection of 10 consecutive slides from Lesson 1 of UNIT 6, Semester 2 (Figure 39).

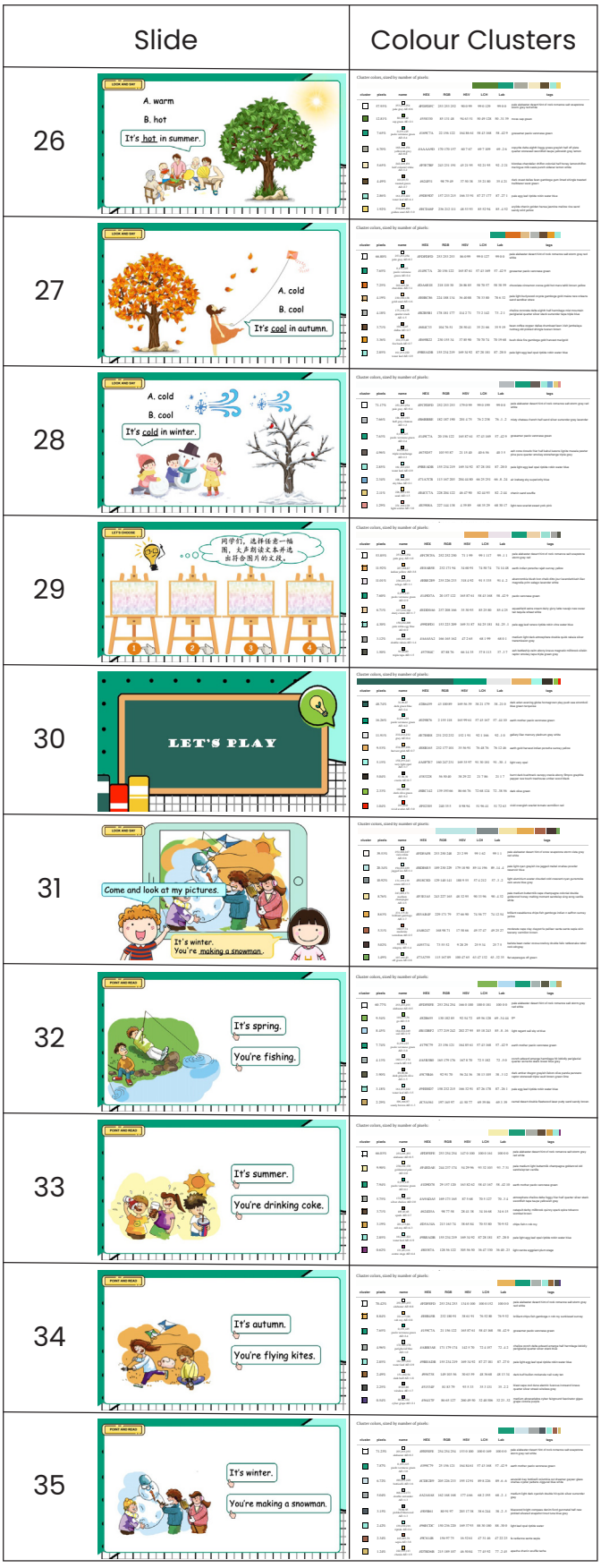


Figure 39: 10 consecutive slides

Step 3: if Step 2 reveals a continuity in colour usage, the analysis proceeds to Step 3. In this step, the consistently used colours are further examined to understand their functional roles and modes of appearance. If no continuity is observed in Step 2, the visual analysis for colour concludes at Step 2.

Motion design

Based on teachers' descriptions of lesson flow in the insight interviews, the motion design analysis focuses on the application characteristics of motion graphics across different teaching sections. The analysis process is as follows:

1. Classify the teaching sections contained in the current teaching material.
2. Categorise the slides into groups according to the teaching sections they belong to.
3. Complexity analysis: For each group of slides, evaluate the number of effects and effect types (e.g., fade in/out, fly-in, zoom, rotation, motion path, as provided by the PowerPoint 'Animation' tool), comparing complexity across teaching stages.
4. Sections association analysis: examine design differences of motion effects across teaching sections.
5. Case description: select representative slides for detailed description, illustrating the alignment between visual features and teaching intentions.

Example shows: According to the order of the teaching process, slides are categorised under different teaching sections. For each section, the included slides are listed, together with the corresponding motion design applied ('Animation' tool). The example is the material from Lesson 1 of UNIT 3, Semester 2 (Figure 40).

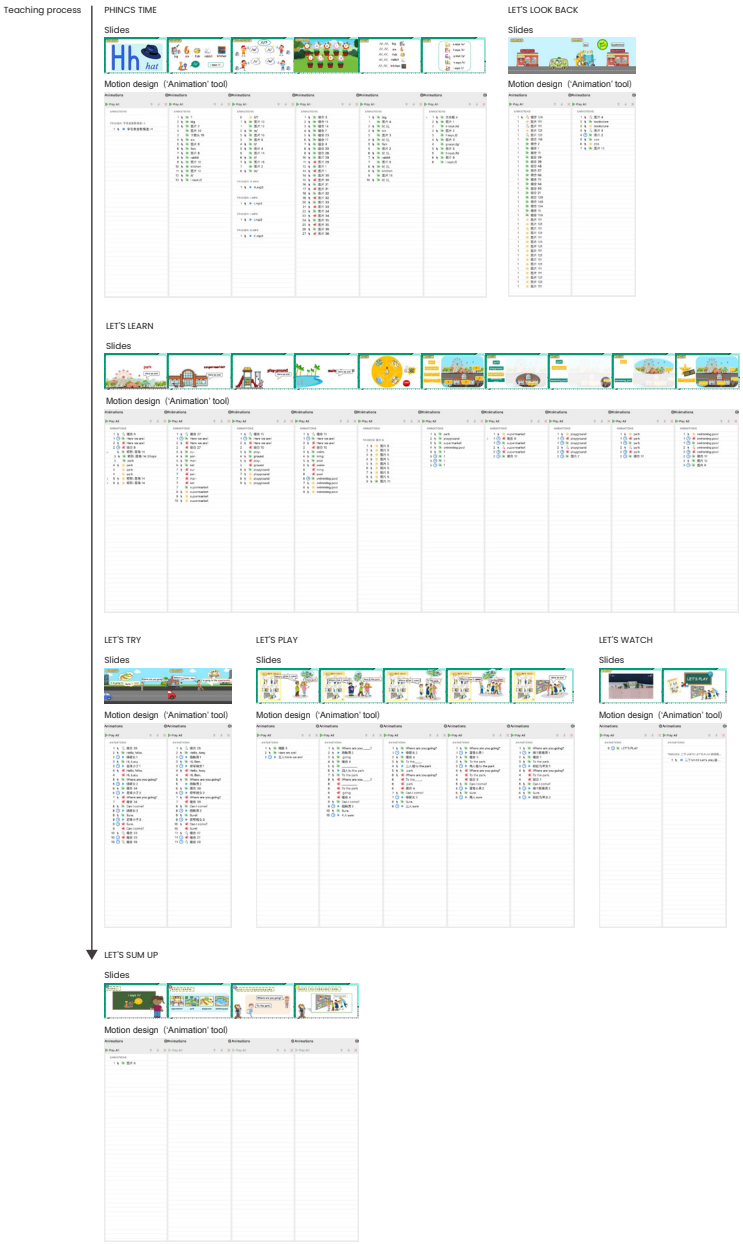


Figure 40: Motion design in slides

Time design

Based on the INSIGHT INTERVIEWS, analyse the existing relationship between time design of motion graphics and lesson flow and attention in the current teaching material:

Alignment with lesson flow

When presenting the new knowledge, whether the duration of motion effects provides sufficient time for students to process and respond. In comparing new knowledge instruction and practice activities, it is whether there are differences in the pacing of motion effects.

Teaching rhythm needs

By analysing trigger methods of motion effects, it explores how time design coordinates with and regulates instructional rhythm.
Different use of trigger reflects the need for step-by-step teaching and deliberate pacing control.

Interactive design

Based on the results of the insight interviews, the analysis focuses on identifying the types of interactive design present in the current materials and mapping them onto different teaching stages according to the lesson flow. In the analytical process, the frequency and distribution of each interaction type across teaching stages are recorded, and their pedagogical functions are surmised. This allows the analysis to interpret the application patterns of interactive designs at different stages and to reveal their usage tendencies as well as the varying levels of complexity in different instructional contexts.

Sound

Conduct a detailed classification of the sound properties used in the current teaching materials.

6.2.2.3 Results of the visual analysis

The main graphics type

According to the proportion calculation, 5,257 out of 5,365 scenes contain 2D graphics, accounting for 97.99% of the total scenes. Of these 5,257 scenes containing 2D graphics, 1,147 scenes include the material from textbook, accounting for 21.8%; 144 scenes include photos, accounting for 2.7 %; 115 scenes include animation, accounting for 2.1 %. The number of scenes that include 3D graphics is 58, accounting for 1.1% of the total scenes. All the 3D graphics are displayed together with 2D graphics. The scenes in the lesson sample selected for analysis do not contain 2.5D graphics. Based on the proportion comparison above, it is evident that 2D graphics are used far more frequently than other types, highlighting 2D graphics as the predominant form in current teaching materials and the primary method of visual expression for the teaching content.

Text

Text size

There are 10 font sizes used in the current teaching material (PowerPoint), in which, there are 6 kinds of sizes (60pt, 48pt, 40pt, 36pt, 32pt, 28pt) used for the expression of main content. The most used font size is 32pt, the rest of the font sizes are selected to suit the overall content volume and visual balance of the layout. There are three kinds of font sizes used for functional components, respectively, lesson title, 36pt (Figure 41); session title, 40pt (Figure 42); and session label, 12pt (Figure 43). The course notes are in 17/18pt and the content lists are in 24pt. It can be noticed that the text used in the different function-specific components remains in font sizes correspondingly, both within the same lesson and across the different lessons of the teaching material.



Figure 41: Lesson title (In the red box)

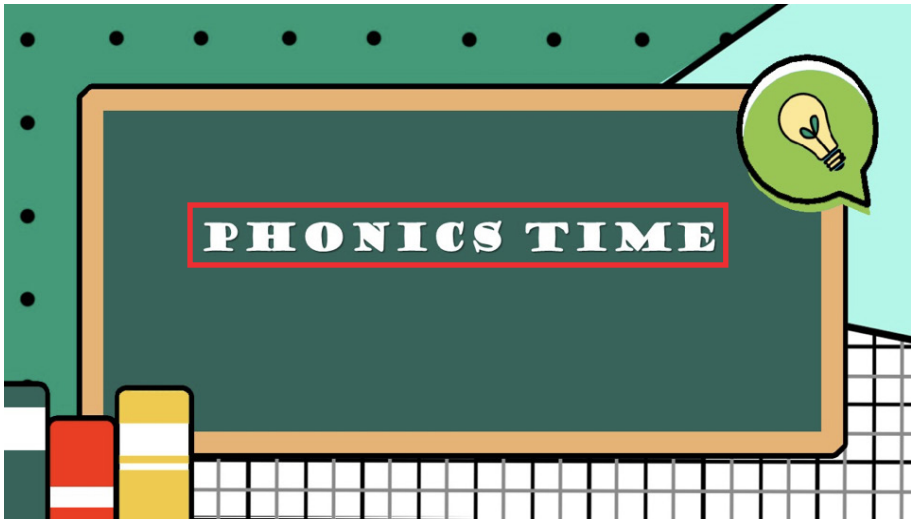


Figure 42: Session title (In the red box)

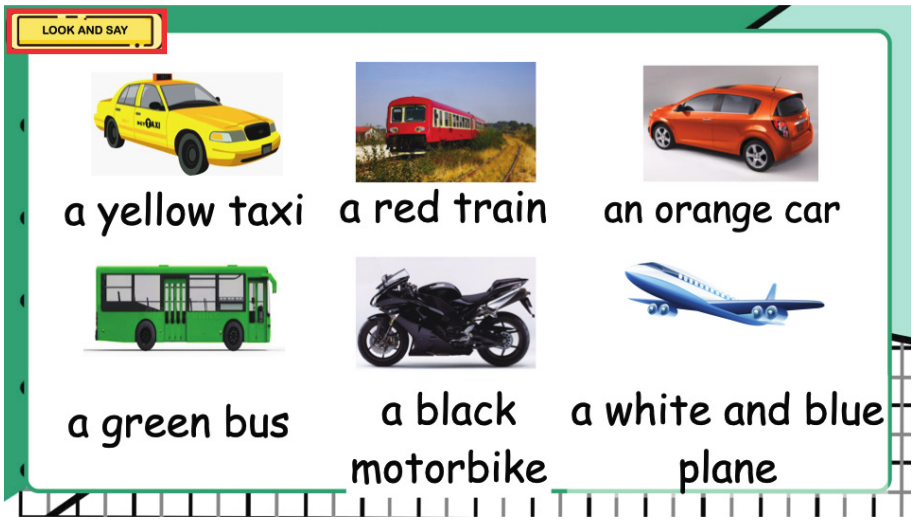


Figure 43: Session label (In the red box)

Text colour

There are three main colours used for the text in the current teaching materials: white, black and red.

- Black is the most predominant colour used, mostly when the background is white, as the contrast between black and white supports legibility (Figure 44).
- White text is used on a coloured background to create contrast and make the text visible. However, there are cases where black text is used on a coloured background. Black and white are mostly used for general content (Figure 45).
- Content that requires special attention is usually highlighted in red, e.g. key vocabulary for teaching (Figure 46).

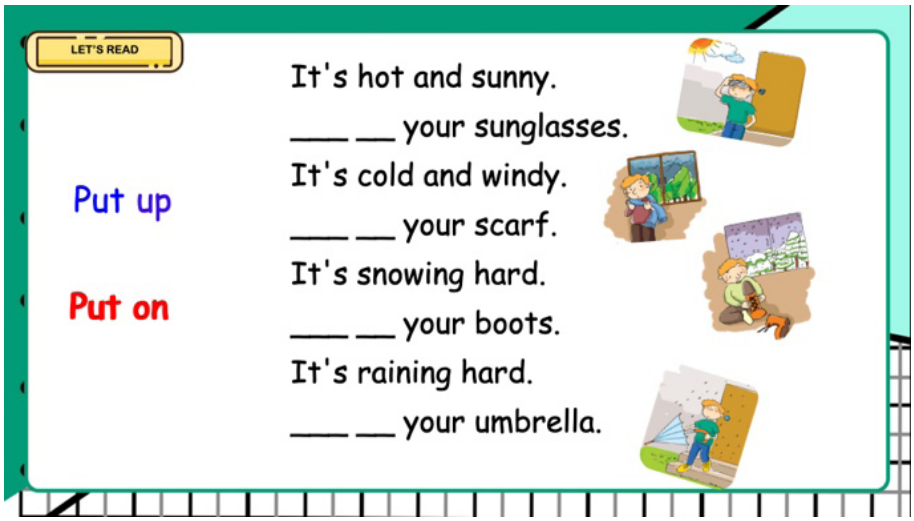


Figure 44: Text in black



Figure 45: White text is used on a coloured background

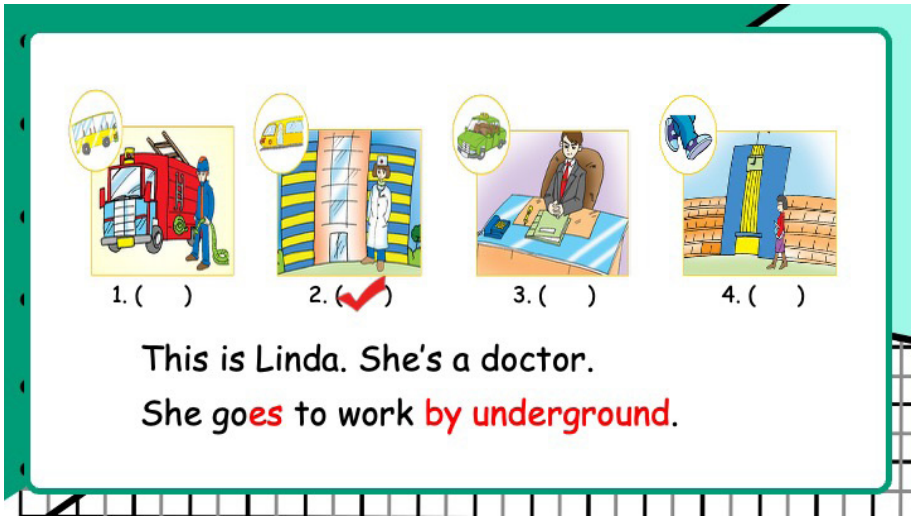


Figure 46: Key vocabulary highlighted in red

Text position

Framing: the design of existing teaching materials can achieve that content-related texts are also visually relevant, both in terms of text placement and text design features.

Salience: In teaching materials, text pairs with images or patterns as decoration, which may surround the text or appear as a background. However, in some slides, although the text itself has a clear information hierarchy based on content, the decorative elements do not align with this visual hierarchy. For example, less important text is paired with highly attractive decorations, causing confusion in reading order. Additionally, the placement of text on the page sometimes contradicts the required reading sequence. For instance, if the content requires students to read from left to right, but the part that should be read first is placed on the right side, it creates difficulty in understanding. Therefore, from a design perspective, if the salience (visual hierarchy) in teaching materials does not match the content expression and properly guide the viewer's reading order, it may cause miscommunication of information and affect learning outcomes.

Information Value: The text layout in the current teaching materials generally follows the requirements of centric and eccentric arrangements based on content attributes and information value. However, some slides show conflicts between text placement and its importance level. This occurs when multiple text elements appear on the same page, and limited space prevents arranging text fully according to the priority of information value, which affects the clarity and logic of information delivery.

Font

The typeface used for the main content is Comic Sans MS, which is known to the teachers as a 'bat font', a non-serif typeface that looks like handwriting. This typeface is required by schools and education departments for the production of teaching materials.

Animation

A total of 10-14 animations are used across five lessons in a single Unit (U), with each lesson incorporating 3-4 animations. The most common session using animation is 'Phonics Time', which is placed near the beginning of the lesson, during which students recognise letters and learn word pronunciation. Teachers

ask students to speak out loud with the content displayed in the animation during ‘Phonics Time’.

In different Units, the ‘Phonics Time’ animation remains the same but is segmented and reused according to the learning progress. For example, in lesson 1 of U1 and lesson 1 of U2, different fragments of the same animation are used. The fragments in U1 practice the sounds of the letters A to D (Figure 47) whereas those in U2 practice the sounds of E to H (Figure 48). Each fragment usually lasts about 20 seconds. The ‘Phonics Time’ animation fragments used in different lessons within the same Unit remain unchanged since the teaching content is the same.



Figure 47: ‘Phonics Time’ animation in U1



Figure 48: ‘Phonics Time’ animation in U2

Besides ‘Phonics Time’, other sections use animation for two purposes:

1. To help students read and sing along in interactive activities such as ‘Let’s sing’ (Figure 49), ‘Listen and sing’ (Figure 50), and ‘Let’s talk’ (Figure 51). These animations lasting from 15 seconds to 1 minute 30 seconds. The splitting and reuse of one animation also occurs in these sessions. Animations lasting about 15–30 seconds are split into fragments for teachers to use interactively with students. Teachers use animations to get students to read or sing along with the content as they watch. These animations usually appear in the middle and final parts of the lesson.

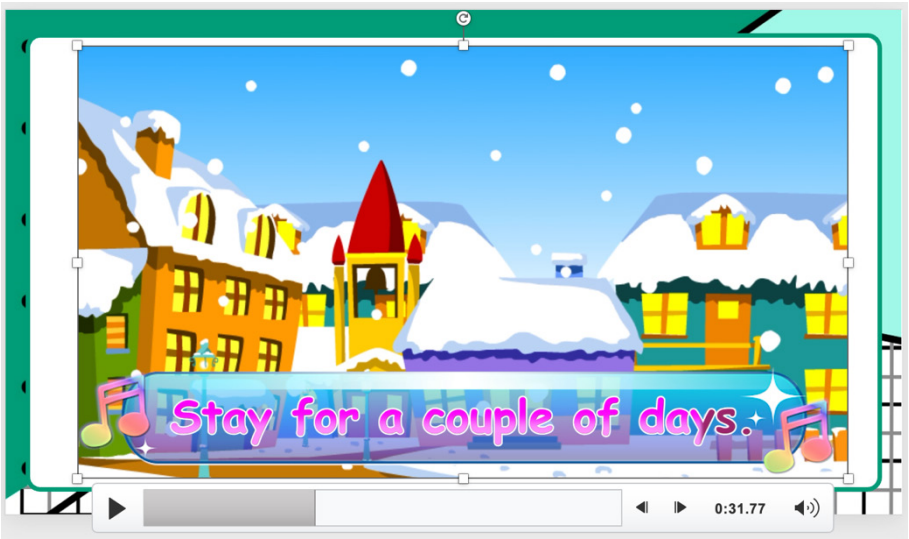


Figure 49: ‘Let’s sing’ animation in U5

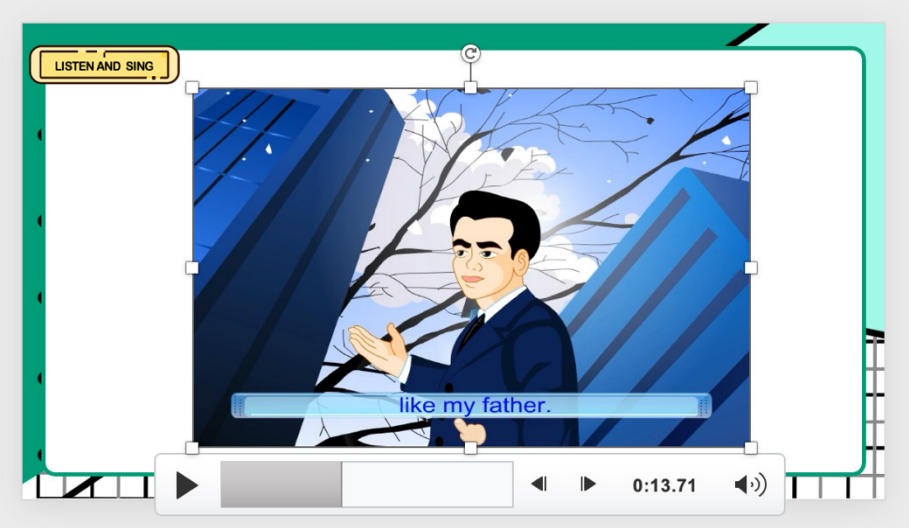


Figure 50: ‘Listen and sing’ animation in U2



Figure 51: ‘Let’s talk’ animation in U1

2. To help students understand the story by watching. For example, in the ‘Let’s watch’ (Figure 52) session, the animation lasts about 30 seconds to 1 minute. While the animation plays, the teacher does not interfere, interact, or ask students to read or sing along. In some Units with STORY TIME lessons (Figure 53), the teacher divides the story into parts and reads them aloud with the students. In the final section of the lesson, an animation shows the whole story, which usually lasts 1–2 minutes. After the animation, the teacher asks students questions related to the story.



Figure 52: ‘Let’s watch’ session in U5



Figure 53: STORY TIME lesson in U6

Photograph

1: Visual display of a specific object corresponding to a word. When the meaning of a specific word needs to be explained to students, teachers often show a photo of the specific object corresponding to the word. For example, when explaining the meaning of the colour ‘orange,’ the teachers use the photo of an ‘orange car’. Since students know that the word ‘car’ corresponds to the car in the photo, which is described as an ‘orange car’, they can deduce that the colour of the car is represented by the word ‘orange’. (Figure 54). The purpose is to allow students to quickly understand the meaning of words most directly, eliminating the cognitive bias after the object becomes graphical.

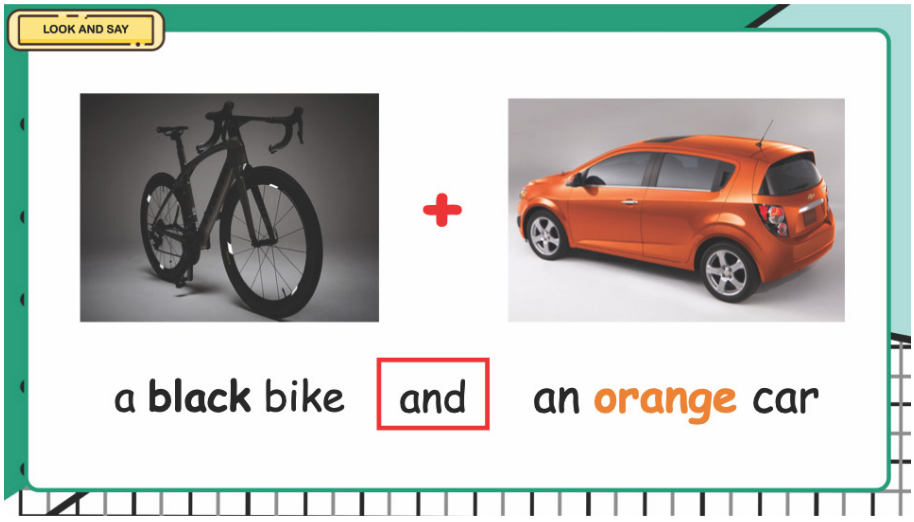


Figure 54: The photo of an ‘orange car’

2: Description of a scenario. When the content involves describing a scenario (Figure 55), teachers use a photo of the specific scenario as an explanatory tool. This approach saves time compared to constructing a scenario with multiple graphics and is more relatable to students' daily lives. Familiar environments or objects evoke stronger responses, enhancing their engagement and understanding.



Figure 55: Description of scenarios

3. For the creation of scenarios. In interactive activities and games, it is essential to create a scenario that serves as the background or story setting for the gameplay. For example, the teacher used a meteor-themed scenario where students read aloud words displayed on stars. A picture of a starry sky set the scene, immersing students in the experience as they observed the meteors. (Figure 56).

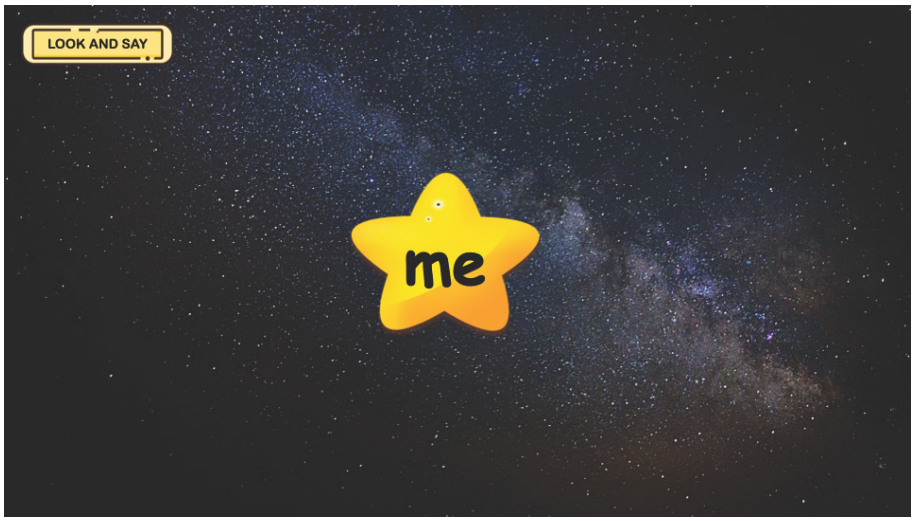


Figure 56: Photograph of a starry sky

4. Characterisation. In some interactive sessions, photos of real people are used as characters. For example, in a game, a photo of a child is used to represent the lead character, allowing the student to take on the role and play the game as that character. (Figure 57).



Figure 57: Signify a character with a photo

Material from the textbook

According to the teacher's description, the use of these textbook materials in motion graphics helps students make connections between what they learn in class and the content in the textbook. The materials used are:

(1) The illustrations from books

The use of illustrations from the textbooks are mostly found in the last lesson of each Unit, which is STORY TIME. According to the lesson design, the main purpose of STORY TIME is to enable students to understand and read the stories aloud. Those stories are all from textbooks, so the teacher uses the illustrations directly from the books, sequencing them according to the story's development and adding dialogues of the characters so that they can read the lines together with the students (Figure 58). The STORY TIME lessons are about picture book reading, which is designed to combine patterns and words to facilitate reading. Therefore, there is no need to recreate new scenes, images, and characters for the story just because it is presented digitally on a PowerPoint. Conversely, there may be a risk that students' perceptions of the connection between classroom teaching and textbook content will be damaged, leaving them confused and assuming that the content of the class is not the same as that in the textbook.



Figure 58: Illustrations from books (left) used in PowerPoint (right)

(2) Character Images

1: Character implication. For example, in the 'class summary' session, the character of the teacher Mr. Leo appeared, emphasising the content of the teaching. In the session of 'Listening and reading after class', the character of a

student doing homework is shown, which implies that this session is about the students' homework after class (Figure 59).



Figure 59: Mr. Leo in 'class summary' (left), character of a student doing homework in 'Listening and reading after class (right)

2: As a player in an interactive game. In the design of some interactive sessions, a main character is needed in the scenes to stimulate the development of the scenario. For example, Koto, a character from the textbook, playing in a game (Figure 60). A particular character serves as an active character in the interactive process, and students can form a scenario by matching content for that character.

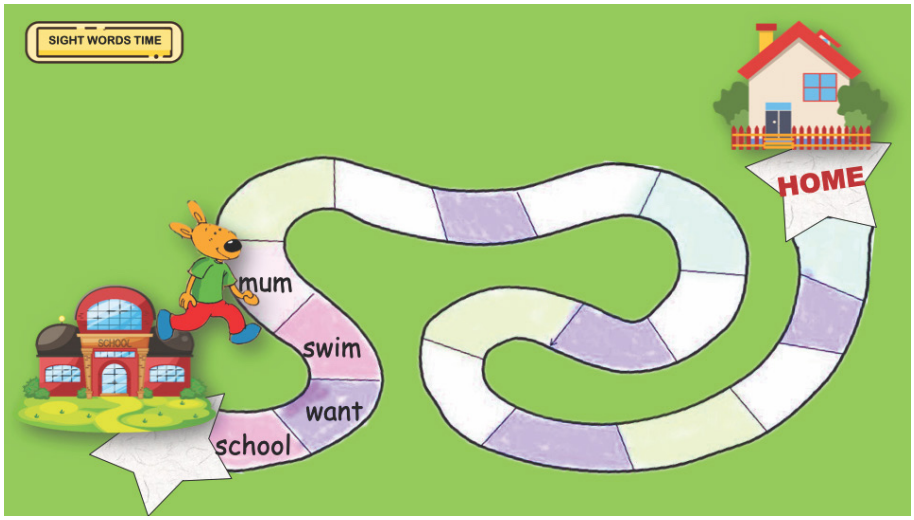


Figure 60: Character in an interactive game

3: Role-playing, in some of the activities, the teacher may ask the students to play one of the characters in the story for reading or performing (Figure 61).

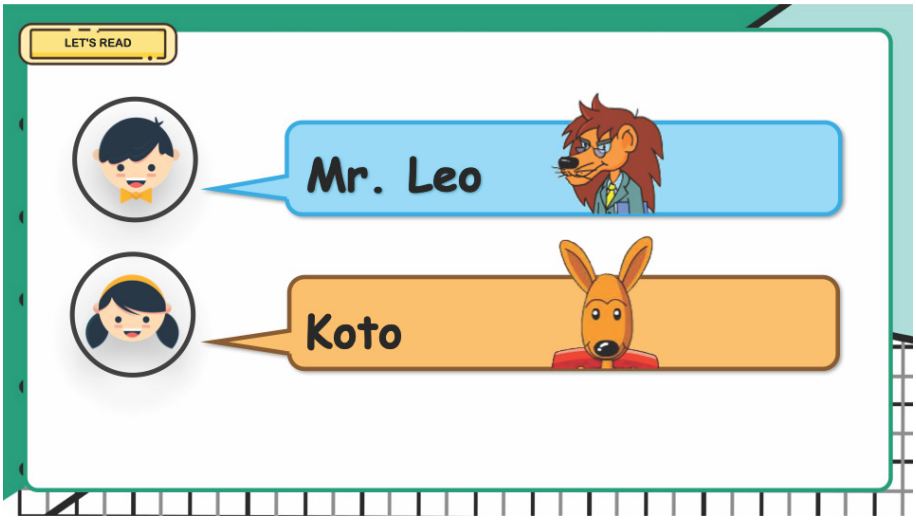


Figure 61: Boys as Mr. Leo and girls as Koto to read the story aloud

Colour

Through Step 1, it becomes apparent that even within the same unit, there are significant differences in colour usage across different lessons, with no consistent visual style or standard in place.

In Step 2, by comparing the Colour Clusters of the slides, it is observed that there are notable variations in colour usage across individual slides. This finding aligns with the results from Step 1, supporting that there is no clear or consistent pattern or visual style in the overall colour usage (Figure 62). However, it is also noticeable that certain colours are frequently repeated across slides, and their proportions remain relatively stable throughout (Figure 63). Based on this finding, the analysis proceeds to Step 3.

Example shows: A random selection of 10 consecutive slides from Lesson 1 of UNIT 6 is analysed using Colour Cluster comparisons.

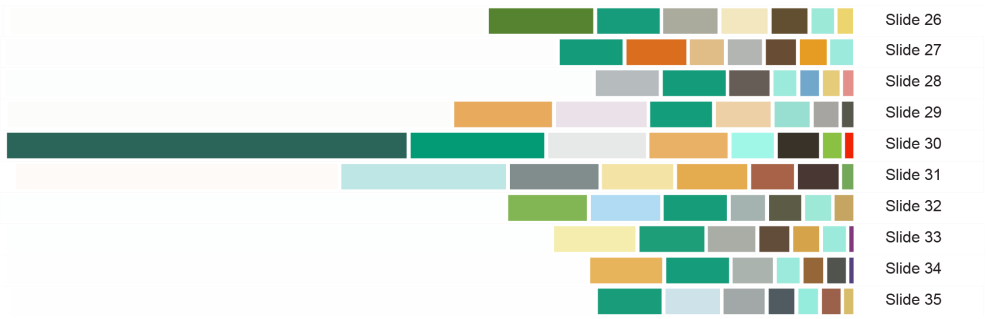


Figure 62: The overall colour usage



Figure 63: Colours are repeated across slides

In step 3, by analysing the colour report (Figure 64) generated by Image Colour Summariser, the specific functions and appearances of the colours that have the continuity of use are as follows:

- **Lesson opening slides**: the opening slide of each lesson consistently employs the same or similar design elements and colour schemes to indicate lesson information, helping students quickly identify different sections (Figure 65).
- **Learning content slides**: the second slide is usually used to present specific learning content, often displaying textbook pages. Apart from the main content, other visual elements tend to remain stylistically and chromatically stable, providing a repetitive and consistent visual cue (Figure 66).
- **Learning objectives slides**: the third slide in each lesson typically presents the learning objectives, with relatively consistent colour combinations for text and background elements (Figure 67).
- **Decorative borders**: many slides incorporate the same decorative border elements, maintaining uniform colours and patterns. However, occasional slides may lack these borders, resulting in partial breaks in local consistency (Figure 68).

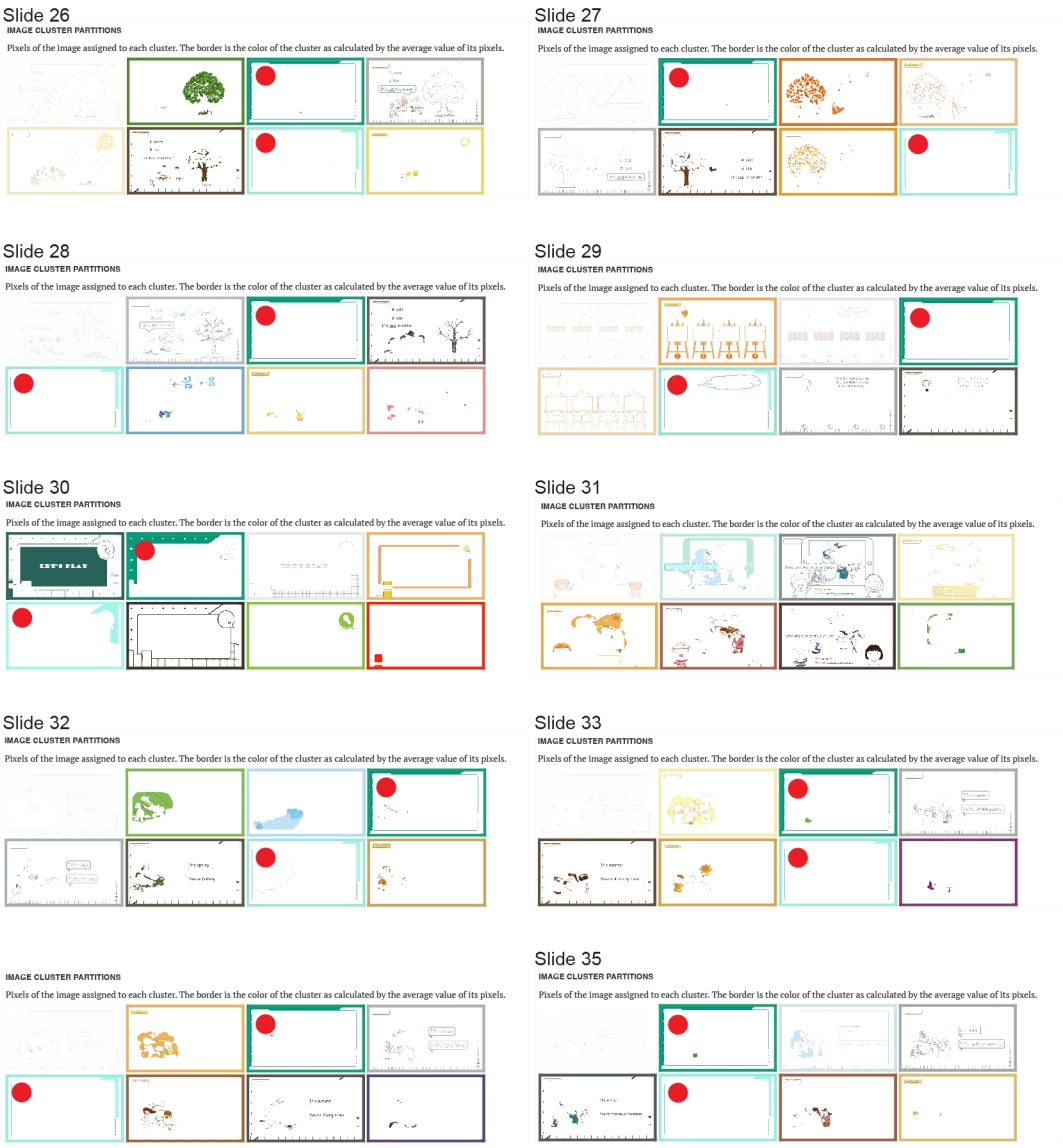


Figure 64: The colour report



Figure 65: Lesson opening slides



Figure 66: Learning content slides



Figure 67: Learning objectives slides

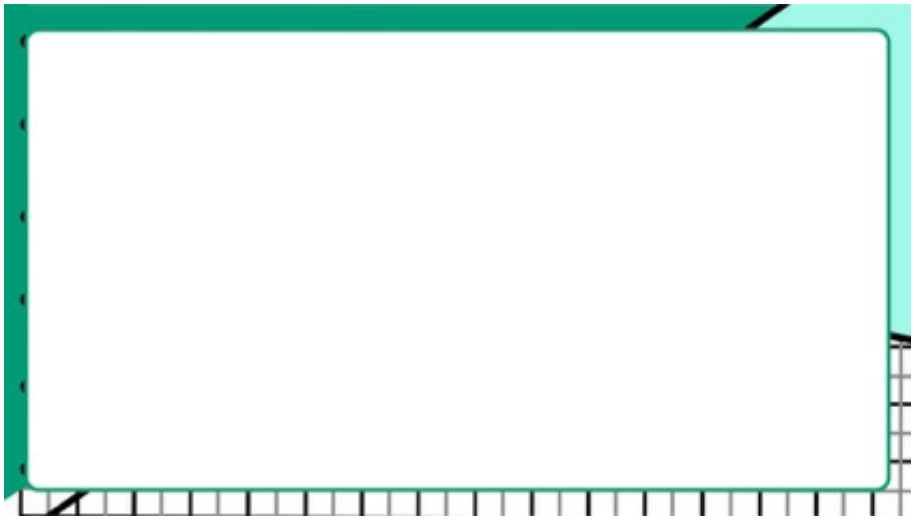


Figure 68: Decorative borders

Motion design

After the review of all Grade 2 teaching materials, a total of 16 different teaching sections are identified, such as *Phonics Time*, *Let's Learn*, and *Let's Sum Up*. Although the composition and sequence of these sections vary across lessons, by adopting the IIO (Input, Internalization, Output) model mentioned by interviewed teachers as an analytical framework, a generalised three-stage teaching flow can be distilled.

1. Teaching section division based on the IIO model

Two critical 'dividing sections' can be found, which enabled the diverse teaching sections to be grouped into three stages:

> **Input Stage**: Marked by the appearance of *Let's Learn*. All sections preceding it (e.g., *Phonics Time*, *Let's Look Back*) primarily serve to present new knowledge, are defined as the input stage.
>
> **Internalisation Stage**: Situated between the end of *Let's Learn* and the appearance of *Let's Sum Up*. The sections in this range (e.g., *Let's Chant*, *Let's Try*, *Show Time*) are characterised by interaction and practice.
>
> **Output Stage**: Marked by *Let's Sum Up* and subsequent content. These sections, typically at the end of the lesson, focus on summarisation, review, and showcasing learning outcomes, and are defined as the output stage.

It should be emphasised that this tripartite division is not a rigid template for every lesson, but rather an explanatory framework derived from the overall material analysis combined with teachers' pedagogical perspectives.

2. Distribution patterns of motion design complexity

Further, the complexity of motion design within slides at each stage is analysed. The "complexity" is defined as the number of effect types and layering relations applied within a single slide, which can be directly assessed through PowerPoint's 'Animation Pane'. The overall analysis revealed a clear but non-linear distribution pattern:

> **The internalisation stage is the most complex**. Slides in this middle-to-late phase of the lesson generally contain the most diverse motion effects. Creators often employ effect layering, timing offsets, and multiple triggers to create engaging interactive experiences and visual appeal, thereby

supporting student practice and participation.

The input stage is moderately complex. At the beginning and middle of the lesson, motion design is also applied, particularly in introductory sections such as *Phonics Time*. However, in the new knowledge presentation section, *Let's Learn*, motion effect complexity tends to be lower, with simpler effects (such as entry and exit of visual elements) to ensure clarity of information delivery.

The output stage is the simplest. Toward the end of the lesson, the use of motion effects significantly decreases, with slides most presented in static form to facilitate review and conclusion.

3. Exceptions discussion

While the above patterns are generally consistent, certain cases deviate due to specific instructional needs. For example, in Unit 6, Lesson 3 of Semester 2, the *Let's Learn* section itself integrated extensive new knowledge presentation and interactive practice, blurring the boundary between input and internalisation stages. Consequently, both stages in this case demonstrated relatively high motion design complexity.

Time design

The analysis reveals a clear tendency in the time design of current teaching materials to serve the rhythmical needs of teachers' instruction.

Duration of motion effects: use of 'fast' presentation

The analysis of the duration and speed of motion effects shows no significant variation across different teaching stages. In most cases, the duration of motion effects is set between 0.5 and 1.0 seconds, which, according to the PowerPoint 'animation' tool, is in the range of 'Fast' to 'Very Fast'.

It can be noted that regarding the question of whether the motion effect duration when new knowledge is presented reserves sufficient reaction time for students, this study cannot provide a definite answer merely through visual analysis, as the required cognitive adaptation time is difficult to estimate due to the differences among individual students and teaching content.

Motion effect trigger: enabling teacher control of instructional rhythm
The application of triggering methods demonstrates a strategic pattern. Two types of methods are identified: manual on-click trigger and automatic display. The analysis result shows a design logic centred on empowering teachers with control over instructional pacing:

Manual on-click triggers are strategically applied at all critical times in teaching. Specifically:

- **Opening of a new slide**: the initial motion effect on each slide typically use on-click trigger.
- **Presentation of core information**: key visual elements conveying new content, such as vocabulary items, example sentences, or explanatory images, are consistently set to manual triggers, enabling teachers to adapt step-by-step pacing in response to classroom conditions (e.g., student reactions and attention).
- **Driving interactive activities**: in classroom games (e.g., a spinning wheel activity), the motion effects initiating key actions (such as clicking the 'Start' button) are also manually triggered, ensuring that the progress of interaction remains under the teacher's control.

Automatic display is mainly used in supportive or decorative motion effects.
Automatic trigger is often employed between two manual triggers to complete a cohesive visual narrative or to enhance visual effects. For example, after a teacher manually triggers the appearance of a car, the subsequent driving and stopping motion may run automatically; likewise, a core vocabulary word may automatically enlarge and fade out after being manually introduced.

Although these patterns do not apply uniformly to every individual case, the general tendency is clear. The time design of teaching materials relies on the strategic use of triggering methods. By assigning all key decision points of the teaching process to manual triggers, the teaching material creators aim to return ultimate control of instructional pacing to the teacher, allowing flexible adaptation to the dynamics of the classroom rather than binding the lesson to a predetermined motion effects display timeline.

Interactive design

The analysis of current teaching materials indicates that interactive design does not follow a single uniform pattern throughout the lesson. Instead, when grouped and compared by different teaching stages, its application aligns with the specific characteristics and pedagogical purposes of each stage. Variations in complexity and frequency of use reflect the instructional goals at different phases.

Input stage: from high-frequency simple interactions to low-frequency focused engagement

At the beginning of the lesson (e.g., in *Phonics Time* and *Let's Look Back* sections), interactive design is characterised by high frequency and high entertainment value. Teaching materials employ simple Q&A, reading aloud, and games (especially in the *Let's Look Back* section, which reviews prior knowledge) to activate students' prior knowledge and engage their participation.

New knowledge presentation section (e.g., "let's learn" section): reduced complexity and frequency

As the lesson progresses into the teaching of new content, both the complexity and frequency of interactions decrease significantly. Interactive forms shift toward more straightforward tasks, such as picture-word matching. While a few playful activities may still appear, the overall trend is simplification, redirecting students' attention to new content. The function of interactive design thus evolves from engaging to maintaining participation.

Internalisation & output stages: intensive and varied interactions for practice and application

In these stages, interactive design plays a role in the main teaching method.

> **Intensive and diverse**: almost all lessons combine 2 to 3 types of interactive activities in continuous use, including games, Q&A, and role-play. Interaction serves as the method for student practice, knowledge internalisation, and application.
> **Blurring of stage boundaries**: intensive interactive activities extend from the internalisation stage to the end of the lesson, blurring the difference between internalisation and output stages. According to the insight interview that student learning outcomes in Grade 2 are primarily assessed through their responses, it can be inferred that these sustained and diverse interactions serve a dual purpose: they provide practice

opportunities, while also creating dynamic and informal assessments through which teachers can observe and evaluate students' learning outcomes.

Overall, interactive design in Grade 2 current teaching material follows a clear pattern: it begins as an 'engaging tool' in the initial phase, shifts into an 'attention-maintaining tool' during new knowledge presentation, and ultimately becomes the 'main teaching method' that drives knowledge internalisation and supports assessment.

Sound

In the current teaching material, sound appears in the following forms:

Sound effects are embedded within individual motion effects. These are non-narrative, non-verbal sound effects that are triggered alongside a single animation and can be set using the 'Animation' tool in PowerPoint. They most commonly appear in the practice sections during the later part of the lesson, where students review or reinforce new content. These sounds are typically brief and subtle, and not every motion effect is accompanied by a sound effect (Figure 69).

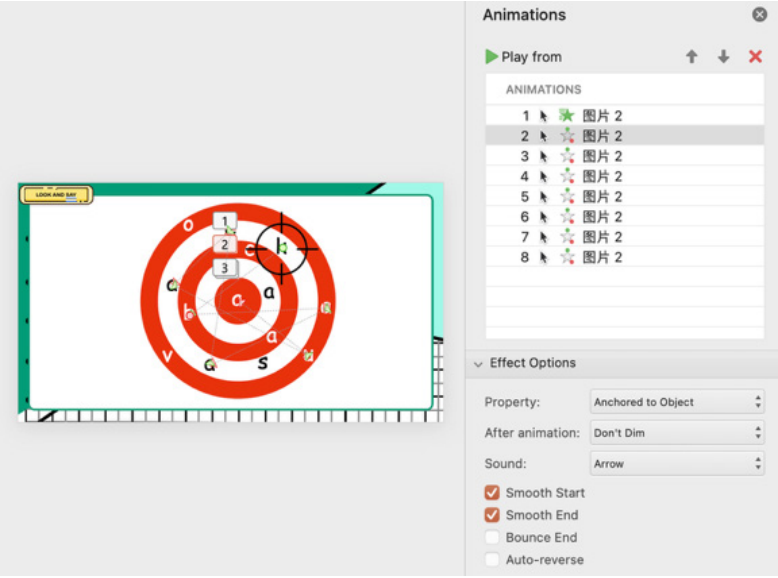


Figure 69: Sounds in individual motion effects

Sound effects between slide transitions: These are typically simulated or representational sounds added to enhance engagement and create a sense of

effect during the transition from one slide to the next. They are using ‘Transition’ tools, where each slide transition can be paired with a specific sound effect (Figure 70).

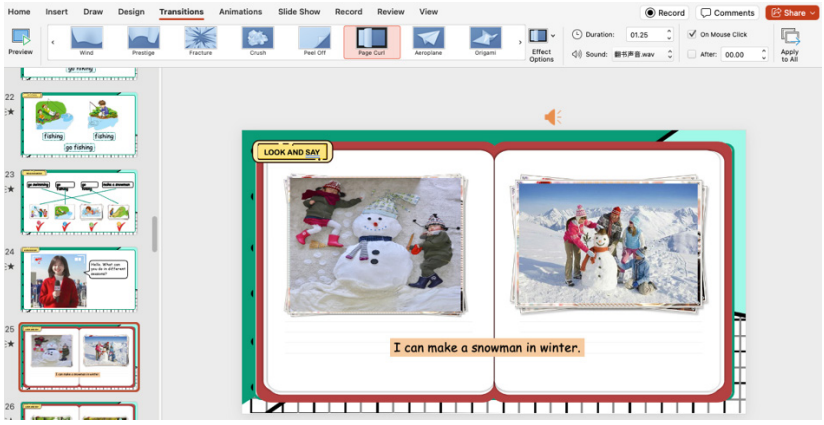


Figure 70: Sound effects between slide transitions

Imported sound effects within slides: These are additional audio elements inserted manually by the creators to support specific content or teaching needs. In the current teaching material, the following types are found:

1 Context-specific sound effects: These are sound effects that correspond directly to the visual content on the slide. For example, a motorcycle engine sound accompanies the image of a motorcycle. They are mainly used in new content delivery, especially for teaching individual vocabulary items (Figure 71).

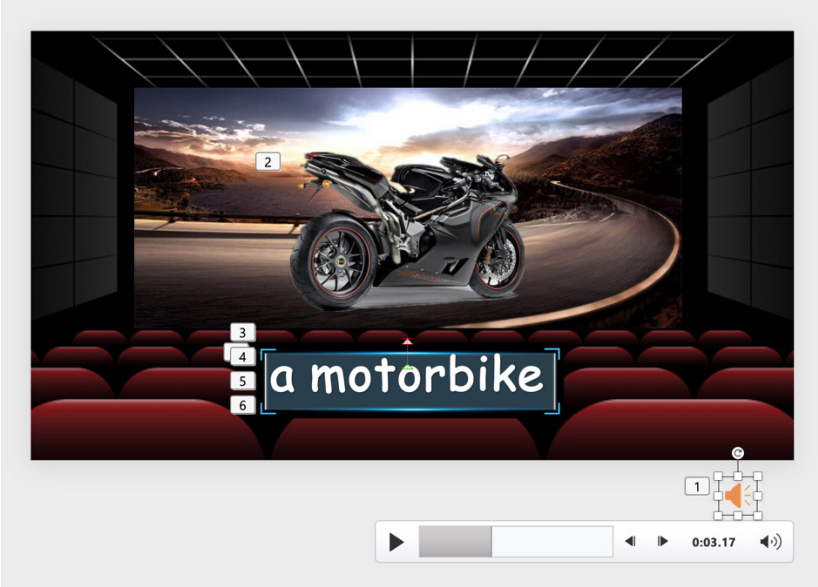


Figure 71: Context-specific sound effects

2 Incorporation of songs: Songs are added during segments where students sing along as part of the learning activity. These are mostly used in the latter part of the lesson as one method for practising newly learned content (Figure 72).

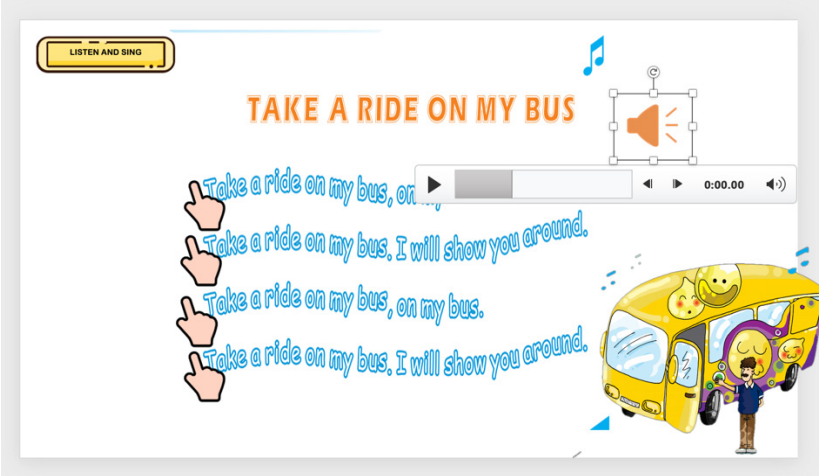


Figure 72: Incorporation of songs

3 Background music for games or interactive activities: Background music is included alongside certain games or interactive segments. However, not every such activity is accompanied by music (Figure 73).

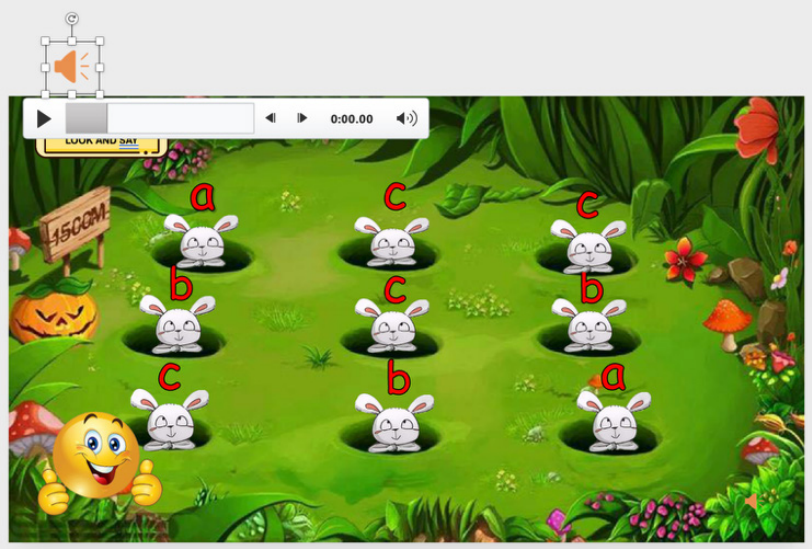


Figure 73: Background music for games or interactive activities

4 Narration of textbook content: When students need to read vocabulary or dialogue sentences, a voice narration is usually added to the slide as a reading model (Figure 74).

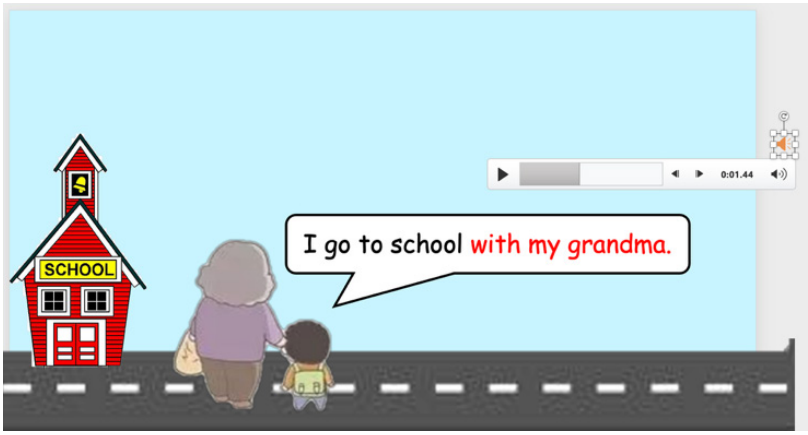


Figure 74: Narration of textbook content

Visual cues in motion graphics

Based on interviews, visual elements in classroom teaching serve multiple functions, with one core role being that of a ‘visual cue’ for guiding student behaviour and instructional activities. Teachers observed that when students are repeatedly exposed to familiar visual elements during lessons, they gradually develop a conditioned response to what those visuals represent in the teaching context. For example, when a particular visual symbol or character appears, students can anticipate the upcoming activities (e.g., game, reading aloud, role play) and adjust their attention and action accordingly.

These visual elements are typically designed as consistent and patterned cues, which subconsciously help students build awareness and expectations regarding the structure and flow of the lesson. Based on a visual analysis of the current teaching material, several categories of typical instructional cue visuals can be identified, along with their design patterns and functional roles, regarding graphics and text design:

1. Reading cue box: a visual cue guiding oral output

In primary English classrooms, reading aloud is a critical component of language learning, particularly in developing students’ listening and speaking abilities. During interviews, teachers emphasised that students often respond spontaneously to familiar visual cues embedded in the lesson slides, especially those prompting oral participation. One such widely recognised and functionally effective visual element is the Reading Cue Box.

The Reading Cue Box typically appears in the form of a dialogue bubble or framed text, functioning as a visual container that encloses written language (Figure 75). While its shape, colour, or outline style may vary across different slides or lessons, its core visual pattern remains consistent: ‘Text enclosed within a graphic shape, forming a unified visual unit.’ Sometimes, the Reading Cue Box is paired with cartoon characters, creating role-play scenarios that increase emotional engagement.

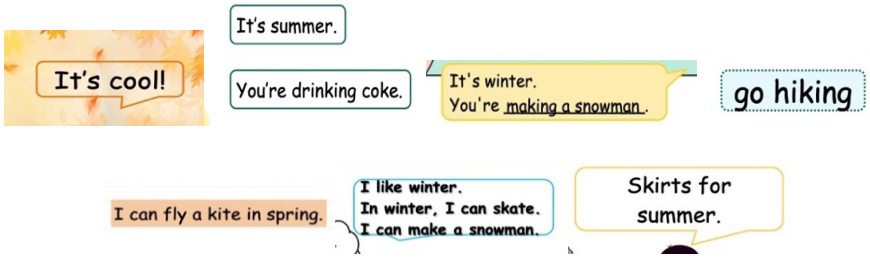


Figure 75: Types of Reading Cue Box

Teachers noted that students have become highly accustomed to this visual structure. Even in the absence of verbal instructions, the appearance of such a graphic-text unit signals to students that they are expected to read aloud. This reflects the conditioned visual response developed through repeated classroom exposure.

2. Section indicator: Visual Labels That Guide Teaching Flow Recognition
In English classrooms, lessons are typically divided into multiple sections. To help both students and teachers identify the sections of instruction, the 'Section Indicator' is used in the current material as a supportive visual cue.

The section indicator is usually designed with a yellow background and a black border. It contains the name of the corresponding lesson section (e.g., 'Let's chant'), displayed as text enclosed within a graphic label (Figure 76). The placement is consistent, fixed in the top-left corner of the slide, establishing both visual consistency and positional habit (Figure 77). This stable design enables students and teachers to quickly identify the section in visually dense slides that contain rich content or motion graphics.



Figure 76: Section Indicators

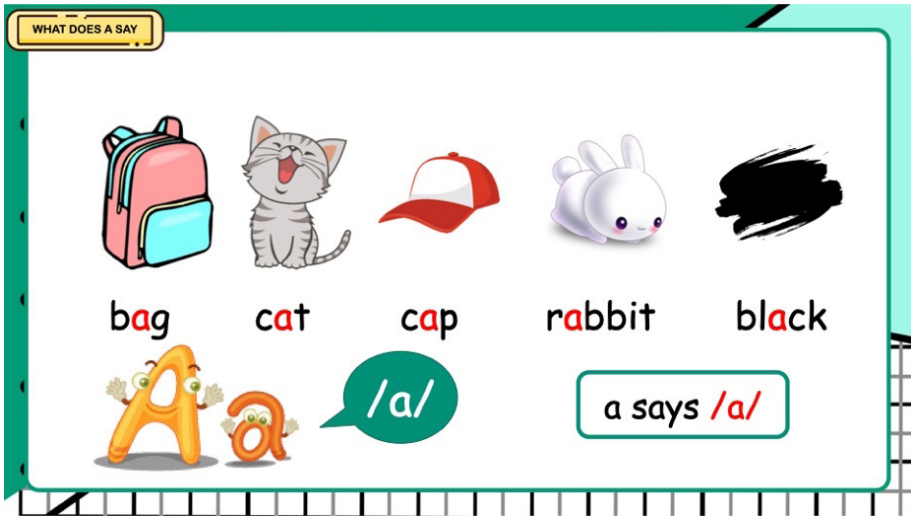


Figure 77: Position of the Section Indicator in slide

However, analysis of the current teaching material reveals that section indicators are not consistently used across all slides. Based on both visual and content review, the following reasons are inferred for this discontinuity: 1) Visual space constraints: on certain slides, designers may delete the indicator in order to preserve scene completeness or maintain clarity when presenting high-density teaching information. 2) Editing oversight: teachers' interviews also revealed that, in some cases, the absence of Section Indicators results from inadvertent omissions during slide creation.

3. Little Hand Icon: Visual Symbol for Behavioural Guidance

In the visual design of the current material, the 'little hand' icon serves as a prompt element, used to guide students in following specific learning behaviours. Based on its form and function, the 'little hand' prompt is categorised into two types: 'Reading-Along' and 'Classroom Interaction'.

(1) Reading-Along: This type features an extended index finger pointing to the text (Figure 78), appearing during synchronized audio playback. The icon slides word by word along the sentence, matching the audio rhythm to connect visual and auditory information. This design aims to encourage students to read along with their fingers pointing to words. Teachers mention this approach in interviews. Some teachers also ask students to place their fingers on the textbook while reading to enhance focus and engagement.



Figure 78: ‘Little Hand’ for Reading-Along

(2) Classroom Interaction: In interactive section such as singing, the icon shows two open palms in a clapping pose (Figure 79). This prompt signals students to clap, energising the classroom and promoting multisensory participation.

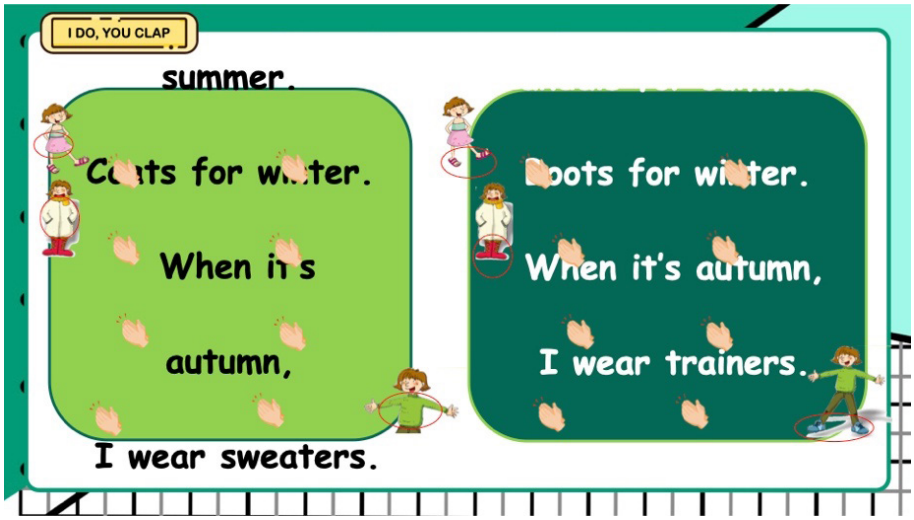


Figure 79: ‘Little Hand’ for clapping

The ‘Notes’ section in the current teaching material

Upon reviewing these materials, it is confirmed that each slide contains a ‘Notes’ section, as mentioned by teachers in the INSIGHT INTERVIEWS (Figure 80, the red box around ‘Notes’). This section does not provide any instructions related to modifying the motion graphics. Instead, the content typically outlines recommended teaching methods for using the slide and explains the design intentions.



Figure 80: ‘Notes’ section in PowerPoint

6.2.3 Part 3 Discussion: insight of Phase 1 of data collection

A key delimitation of this research is the intentional exclusion of an in-depth investigation into ‘sound’ as a design property. The domain of sound design is a complex, specialised field requiring expertise in acoustics, psychology, and pedagogy that falls beyond the scope of this research. To maintain research rigour and avoid introducing uncontrolled variables, sound is not treated as a design property in the iterative prototype tests and discussion. Consequently, the final guideline of ‘sound’ is presented as a supplementary outcome, derived only from a synthesis of teacher suggestions collected throughout the research, rather than from direct empirical testing within this research framework. This strategic decision ensures the research’s focus and the integrity of its core findings. The discussion follows the Section 6.2.1.7, presented in two aspects.

Aspect 1: definition of motion graphics in this research

Motion graphics in this research.
Based on the discussion in Chapter 2, it is clear that the basic connotation of motion graphics consists of two core elements: ‘motion’ and ‘graphics’. It is a medium that conveys visual information through the organization of time series and dynamic demonstrations.

On one hand, teachers do not yet form a highly specialised concept of ‘motion graphics’ and generally interpret it literally as ‘moving graphics’ or ‘dynamic images’ (Section 6.2.1). In the literature, ‘graphics’ covers all visual media forms that carry and convey information, with a broad scope extending from early 2D software-generated graphics to various visual materials. This aligns with the elements of motion graphics mentioned by teachers (such as pictures, shapes, patterns, and emojis).

On the other hand, ‘motion’ in the literature refers to the temporality and dynamism of visual expression, including the spatial movement of visual elements within the visual field (such as translation, rotation, and scaling) and changes in visual attributes (such as clarity, colour, or structural adjustments). Even if visual elements do not change spatial position, any change along the time dimension conforms to the definition of ‘motion’. The interviewed teachers understand this as automatically playing dynamic images, GIFs, or pictures containing animation elements, showing that their understanding of ‘motion’ focuses on the dynamic feature of ‘movement’ or ‘change’, which is basically consistent with the definition in the literature.
It is worth noting that teachers do not deliberately distinguish the boundary between motion graphics and other related media. Therefore, the relationship still follows the view put forward in Chapter 2: motion graphics often overlap and integrate with short films, videos, interactive media, and other media forms in practice and do not necessarily exist as completely independent information carriers. Despite these overlaps, motion graphics retain unique attributes through their time-based dynamic visual presentation and cannot be equated with any single medium.

In classroom teaching, teachers interpret motion graphics mainly through their experience with PowerPoint. Teachers associate the motion effects in PowerPoint (such as animated entrance, exit, and transition effects) embody the ‘motion’ in motion graphics. This means, the motion graphics in this research

still rely on the basic connotations of ‘motion’ and ‘graphics’, and teachers regard PowerPoint as the main multimedia teaching tool, the main display platform and production tool of motion graphics. Teachers’ long-term use of PowerPoint forms their understanding that ‘motion graphics are the “moving” content within slides’. PowerPoint supports motion graphics by displaying visual content, adding dynamic effects, embedding short videos, and integrating sound.

At the design aspect, the motion graphics in this research still follow the two design dimensions mentioned in Chapter 2: 1) visual content and presentation format (that is, ‘what to show’ and ‘how to present visually’); 2) motion, time design, and rhythm arrangement (that is, ‘how to move’, ‘when to move’ and ‘how long the moving last). These two dimensions together determine the efficiency of information transmission and the audience’s understanding. At the functional aspect, the core value of motion graphics lies in transmitting relatively complex information more quickly, effectively, and accurately in a short time through fragmented information structures and dynamic demonstration. Meanwhile, motion graphics often combine with sound design and interaction design to further enrich the expression of information and enhance the audience’s sense of immersion and engagement. This is also why motion graphics are widely used in classroom teaching. However, as PowerPoint is the main platform and production tool of motion graphics in classroom teaching, its functional characteristics and technical constraints limit the diversity and complexity of motion graphics design in terms of visual presentation and motion time arrangement.

Aspect 2: teachers, students and motion graphics as an educational tool

As described in Section 6.1, the following discussions are conducted with four aspects, with the integrated content presented according to the essential discussion ‘topic’.

Topic 1: Motion graphics design, lesson flow and attention

Using the IIO teaching model as the timeline for lesson implementation, the following discusses how motion graphics should be designed in different teaching stages to effectively attract students’ attention.

(1) Trigger students' involuntary attention

In the IIO model proposed by Ling Shunshi (2015), the lesson begins with the 'Preparation Stage'. She states that, at this stage, teachers should capture students' attention by organising warm-up activities. Correspondingly, the interviewed teachers indicate that the primary goal at the beginning of a lesson is to attract students' attention quickly. But they describe this goal as part of the 'Input Stage.' Based on their understanding of the IIO model, most teachers believe the model mainly consists of the three stages: Input–Internalisation–Output. Therefore, they regard the entire process from the beginning of the lesson to the practice of knowledge as the 'Input Stage.' Within this framework, the 'Preparation Stage' proposed by Ling can be understood as the initial section of the 'Input Stage.'

According to the *Theoretical Foundations of Education and Teaching* (Teacher Qualification Examination Guidebook), the teaching process follows Gagne's 'Nine Events of Instruction' (Kruse, 2009), in which 'Gain attention' is the first event. At this event, teachers should stimulate students' curiosity, promote their perception and thinking activities, and trigger resonance by drawing on their life experiences, thereby transitioning to new teaching content. In relation to the Attention Span Curve of students in class, the trend of students' attention changes presents an 'increase-peak-decline' pattern (He Shanliang, 2017). Therefore, within the first 5 minutes of the class, teachers need to quickly capture students' attention to gradually enhance their concentration (Yang Xiaochun, 2011), which can be named 'initial engagement phase'. The core task of this phase is to trigger students' 'involuntary attention', a concept defined in the Theoretical Foundations of Education and Teaching as attention elicited by the physical properties of a stimulus. Although Xu Jiongfu (2013) explored this concept within a middle school context, his conclusion that the initial moments of a lesson should leverage involuntary attention is particularly relevant for primary students. According to developmental psychology, primary schoolers' capacity for self-regulated attention is still maturing, which makes their attention more readily captured by novel and dynamic external stimuli (Ruff and Rothbart, 2001, Vohs and Baumeister, 2016) Thus, it is evident that quickly stimulating students' involuntary attention within the first 5 minutes is the core task to guide them into a structured learning process.

In response, the interviewed teachers suggest that at the beginning of the lesson, they use video clips (including animation) to quickly attract students' attention. They observe that, aside from interactive activities, such moving

visuals are the most engaging among students and the most effective in instantly stimulating their interest. The visual analysis of the teaching materials shows that the first teaching section, ‘Phonics Time’, typically includes a 20-second video clip. This design aligns with the teachers’ suggestions, indicating its potential effectiveness as an attention-guiding strategy.

From a design theory perspective, Faraday (2000) points out that in digital information displays (web), viewers exhibit a specific visual hierarchy in which moving visuals are the most attention-grabbing and readily captured by the human visual system. This indicates that videos, due to their ‘moving things’, are more attractive to viewers than other visual elements. Additionally, according to the *Theoretical Foundations of Education and Teaching*, movement and change of stimuli are key factors in triggering involuntary attention. Specifically, motion stimuli are more likely to attract attention than static ones. Video clips, through their continuous image transitions and motion characteristics, align with this principle.

In summary, using short video clips at the beginning of a lesson as a design property in motion graphics can effectively stimulate students’ attention. This approach is supported by both theoretical evidence and practical experience. In addition to using video clips to trigger students’ involuntary attention, the book, Theoretical Foundations of Education and Teaching, mention other relevant conditions and influencing factors:

- **Strong contrast between stimuli**. Larger objects tend to attract more attention, and the perception of ‘large’ versus ‘small’ is often formed through relative comparison. During the initial PowerPoint slides of a lesson, presenting size contrasts between objects can enhance visual impact. Faraday (2000) also notes that size contrast in visual objects ranks right under motion in terms of visual appeal and is a key design strategy for quickly capturing attention.
- **Intensity of the stimuli**. Compared with plain text, images and graphics are more visually engaging. Bright colours, when contrasted with darker colours, can enhance the strength of visual stimuli. Both approaches help modulate the visual impact of static elements. In Faraday (2000)’s proposed visual hierarchy, colour contrast in images is more attention-grabbing than text alone, regardless of the font style used.
- **Novelty and distinctiveness of the stimuli**. New or relatively unfamiliar stimuli are more likely to draw attention. In motion graphics design,

where the primary audience is students, the degree to which the design elements, whether familiar, brand-new, or novel, align with students' cognitive states directly influences their attention levels. Teachers observe that students tend to lose interest in repetitive content or interaction formats, leading to disengagement. As such, new visual elements may be more effective in attracting attention.

However, teachers also point out that students' responses to unfamiliar content are not always positive, as they may not yet have the cognitive foundation to engage with the new elements. Therefore, when introducing new visual elements, it is necessary to consider whether they contain unfamiliar learning content and whether they might impose an additional cognitive burden. While students may not initially understand new material and require time to process it, teachers believe that curiosity can still drive them to actively engage with new content.

(2) Clear expression, transformation to voluntary attention

After successfully triggering students' involuntary attention, according to Ling's 'Preparation Stage', the other mission is to clearly present the main objectives and learning tasks of the lesson. This stage corresponds to the second step of Gagné's instructional events (Kruse, 2009), 'State the Learning Objective', which directly follows 'Gain Attention'.

Xu Jiongfu (2013) points out that after capturing students' involuntary attention, teachers should transition it into 'voluntary attention' (as defined in the Theoretical Foundations of Education and Teaching) to ensure that students enter an active learning state. Xu Jiongfu (2013) claims that students' level of voluntary attention typically peaks between the 5 to 20 minutes of the lesson, which trend is supported by the classroom Attention Span Curve (Yang Xiaochun, 2011) (Yang Xiaochun, 2011).

The Theoretical Foundations of Education and Teaching highlights that one of the key factors in maintaining voluntary attention is enhancing the understanding of learning tasks and goals. This aligns with the lesson design emphasised by both Ling Shunshi (2015) and Gagné, which stresses the importance of introducing learning objectives and tasks early in the lesson. Therefore, this 'State the Learning Objective' event can be considered an effective way to stimulate voluntary attention.

However, in the current teaching materials, the section introducing learning objectives and tasks is typically arranged before ‘Phonics Time’, that is, before the ‘Gain Attention’ event. This ordering differs slightly from Gagné’s. However, Ling Shunshi (2015) does not prescribe a strict sequence for missions within the ‘Preparation Stage’, according to her practice. It may suggest that both sequencing approaches may be valid. Further research is needed to verify the effectiveness of these different implementations.

In terms of motion graphics design, this stage requires a clear presentation of the course objectives to help students form expectations about the learning outcomes and to stimulate motivation to complete the tasks (Kruse, 2009). Since presenting learning objectives has been proven to promote voluntary attention, interviewed teachers further note that the primary design requirement for motion graphics should be to communicate content as clearly as possible. Therefore, in the motion graphics design for this stage, clarity of information should be prioritised, and overly decorative or out-of-topic design elements should be avoided, as they may distract students and reduce their learning focus.

(3) Visual accuracy and support interactive activities, maintain voluntary attention

In the ‘Preparation Stage’ proposed by (Ling Shunshi, 2015), another key mission is to activate students’ prior knowledge or life experience, using it as a foundation for introducing new lesson content. This mission corresponds to the ‘Stimulate Recall of Prior Learning’ event in Gagné’s.

According to the current structure of the teaching materials, this task aligns with the ‘Let’s Look Back’ section, which typically follows ‘Phonics Time’. This section often takes the form of interactive activities, for example, having students read aloud words displayed in the motion graphics. Such a design supports by one of the key factors in maintaining voluntary attention, ‘well-organized instructional activities’ (Theoretical Foundations of Education and Teaching), by promoting sustained attention through clearly structured and purposeful tasks.

In this stage, the motion graphics must be closely aligned with the content of the interactive activity to enhance both effectiveness and logical coherence. For instance, in the current teaching materials, the lesson theme is ‘seasons,’ and the visual scenario used is snowfall. Each falling snowflake contains a word, and students are required to read aloud the word they see and learned before.

This design integrates review tasks with visual stimuli, increasing student engagement. Therefore, motion graphics design should ensure visual accuracy and cognitive compatibility. The images representing ‘snowflakes’ must match students’ visual understanding to prevent misconceptions. The falling speed of the snowflakes should align with students’ reading and reaction pace, ensuring they can clearly identify the information and respond in a timely manner.

(4) Reducing florid expressions for new content instruction

According to Ling Shunshi (2015), after completing the tasks in the previous stage, the lesson enters the ‘Input Stage.’ In this stage, the teacher formally presents the language content and guides students to experience language use in specific contexts. The teacher is expected to create corresponding language scenarios and present the target language through various methods, enabling students to understand the meaning and function of the language within context. This teaching process corresponds to the ‘Present the Content’ event in Gagné’s, which marks the formal instruction of new content.

Xu Jiongfu (2013) points out that ‘teaching new content’ should be scheduled during the peak of students’ voluntary attention, as this stage is critical for language acquisition and demands the highest level of student focus. Specifically, this time period falls within the 5 to 10 minutes after the lesson begins. According to the attention Span Curve proposed by Yang Xiaochun (2011), students’ attention is at its peak during this period, which is therefore referred to as the ‘Peak Attention Phase.’ Teaching core content during this phase helps to maximize learning outcomes and enhance students’ receptivity to and understanding of language knowledge.

Therefore, during this stage, according to the interviewed teachers, students are highly concentrated, and it is essential that new content is delivered clearly and effectively. As a result, the design of motion graphics at this stage should prioritize clarity and accuracy over visually striking or attention-arousing effects. Teachers express concerns that students may become distracted by overly stimulating visual elements, which could increase extraneous cognitive load, diverting students’ attention. To mitigate this risk, it is recommended that motion graphics minimize the use of decorative or moving elements that might unnecessarily attract attention. Among all teaching stages, this stage tends to include the fewest decorative features.

From the visual analysis of the current teaching materials, it is observed that in the corresponding ‘Let’s Learn’ section, the visual design of the motion graphics remains relatively rich, still incorporating decorative elements similar to earlier sections. However, interactive activities are less frequently used, and the overall layout is simpler. This simplification is achieved through design strategies like using more blank backgrounds, which helps to reduce visual noise and foreground the instructional content. This approach suggests a deliberate attempt by designers to manage students’ focus. While motion effects are still present, their use appears more purposeful, often employed to demonstrate key concepts rather than for purely aesthetic reasons. This aligns with the principle of using visuals to reduce intrinsic cognitive load.

In summary, during this stage of instruction, the use of design properties in motion graphics should be reduced and carefully controlled, with a strong emphasis manage cognitive load by prioritizing instructional clarity. Motion effects should be used purposefully to support key demonstrations while avoiding extraneous elements that could hinder student focus.

(5) Support interactive activities, enhance voluntary attention

After the teaching of new content, the lesson transitions into the ‘Internalization Stage’ (Ling Shunshi, 2015). During this phase, students engage in various activities to practice and process the newly acquired knowledge, transferring it from immediate memory to short-term memory and preparing for long-term storage by constructing cognitive structures. This aligns with ‘semantic encoding for storage in long-term memory’, as referenced in Gagné’s cognitive model under the instructional event ‘Provide learning guidance’ and ‘Elicit performance’.

According to the Attention Span Curve, students’ voluntary attention remains relatively high after the first 20 minutes of class but begins to decline gradually, this is referred to as the ‘Gradual Decline Phase’. This phase is short, lasting approximately 5 minutes, after which students enter the ‘Fluctuation and Recovery Phase’. During this phase, fatigue becomes more evident, and students often exhibit reduced concentration.

Xu Jiongfu (2013) identifies this period (20–30 minutes into the class) as the ‘Voluntary attention enhancement’. Although students can still utilize voluntary attention, their focus is more prone to diminish due to accumulating fatigue. This claim is consistent with the interviewed teachers’ practices. During the

‘Internalization Stage’, they introduce a variety of interactive activities to help students consolidate their understanding of new content while maintaining voluntary attention through engaging formats. Teachers generally encourage increased richness in motion graphics design at this stage; however, they also caution against excessive repetition and over-complexity (refer to the Phase 1 interview analysis summary for details).

To maintain and reinforce voluntary attention, *Theoretical Foundations of Education and Teaching* emphasizes the effective use of interest. This can be addressed from two perspectives:

- **Stimulating direct interest in instructional content and tasks**. In motion graphics design, this involves integrating elements aligned with students’ current preferences, such as popular cartoon characters or familiar real-life scenarios. Teachers noted that students are more engaged when visual content reflects recognizable cultural elements. Due to cultural diversity, designers using interest-driven approaches should be aware of students’ exposure to contemporary media and evolving trends in popular culture.
- **Generating indirect interest in the outcomes of learning tasks**. Even when students are not immediately interested in the tasks, either due to task familiarity or unfamiliar formats, they may still be motivated by the results. Teachers observed that competitive games or interactions often heighten engagement. In such tasks, students are driven by a desire to win and receive praise from teachers, making the outcome itself a source of motivation.

The analysis of current teaching materials reveals that the instructional stages following ‘Let’s Learn’ and leading up to ‘Let’s Sum Up’ involve multiple interactive activities such as matching, role-playing. Correspondingly, the motion graphics design becomes more elaborate. However, this is also where design can undermine the teaching goal. Visual analysis shows issues with ambiguous visual elements, incorrect information, and problems in visual hierarchy. Such flaws directly challenge the effort to sustain voluntary attention, as they force students to expend additional cognitive resources on deciphering unclear instructions or correcting erroneous content, thereby accelerating mental fatigue and disengagement.

(6) Maintaining two facets of attention

The lesson enters the last two stages proposed by Ling Shunshi (2015): the 'Output Stage' and the 'Assessment Stage'. In the Output Stage, students engage in language production, using the target language in various scenarios. In the Assessment Stage, teachers observe and evaluate students' learning outcomes. According to the interviewed teachers, due to the characteristics of Grade 2 students (and also because there is no formal course assessment for Grade 2 this region to reduce academic pressure), these two stages are often conducted simultaneously in practice. Teachers typically begin guiding students' language output through interactive activities during the 'Internalisation Stage' and evaluate their performance at the same time. Therefore, in practical classroom settings, the boundaries between these three stages are often blurred and may even be integrated.

From the perspective of Gagné's instructional events, once students enter the 'Fluctuation & Recovery Phase' of attention, the teaching focus shifts toward learning outcomes. The corresponding instructional events include 'Provide Feedback,' 'Assess Performance,' and 'Enhance Retention and Transfer to the Job.' These events align with the current practices of the teachers.

According to attention span curves, students' focus begins to fluctuate and gradually decline after the peak (Wu Jingyan, 2003; Wang Yaupui, Qiao Ya, Xiao Xinke, 2017). Qin & Zhang (2023) state that toward the end of the lesson, student attention reaches its lowest point. However, around 5 minutes before the class ends, a 'attention rebound' may occur (He Shangling, 2017; Wang Yaupui et al., 2017; Yang Xiaochun, 2011). Teachers generally speculate that this resurgence is due to students becoming excited about the approaching end of class.

Xu Jiongfu (2013) notes that in the later stage of the lesson, the optimal period for sustained voluntary attention has passed, and students tend to shift to involuntary attention. He suggests minimizing the negative effects of involuntary attention and using varied methods to capture it, enabling students to continue learning. Experienced teachers, he argues, can transform students' involuntary attention back into voluntary attention through interactive techniques, alternating between the two to maintain students' attention on instructional tasks.

Considering the above, the design of current teaching materials, which incorporates diverse interactive activities after the presentation of new content,

helps sustain students' voluntary attention. These interactive activities are often supported by PowerPoint visuals, serving as both trigger and aid. Therefore, motion graphics become more diverse at this stage, with a wider variety of design properties tailored to support interactive tasks. In some lessons, video clips are reintroduced. From a content design perspective, such clips serve a clear purpose in certain sections (e.g., 'Let's Watch') by reviewing classroom content. At the same time, they may also help redirect students' involuntary attention back to the lesson. In line with Xu Jiongfu (2013)'s view, these strategies are particularly effective when student attention is low, helping teachers alternate between voluntary and involuntary attention to maintain engagement with the learning content.

Topic 2: Motion graphics and situated learning in the classroom

In the widely adopted situated learning approach in current Chinese primary school classrooms, teachers usually construct instructional contexts by creating simulated scenarios. This method emphasises promoting language learning within quasi-authentic interactive environments. Even though the teaching activities are simulated in classrooms, the core lies in effective instruction through genuine interaction and contexts relevant to learners' surroundings (Lave & Wenger, 1991). In practice, teachers tend to design simulated situations that closely relate to students' life experiences to enhance the relevance and practicality of learning (Mao Huaying, 2025).

Within this framework, the use of multimedia resources is regarded as a key tool for constructing virtual scenarios, and its effectiveness has been validated in practice (Jiang Qi, 2024). Among various multimedia forms, motion graphics, due to their visual clarity and contextual expressiveness, effectively support the instructional demands of situational scenario construction.

From the perspective of vocabulary teaching, both specific vocabulary teaching and procedural teaching advocate the use of multimedia expression (Sun Sheu, 2012; Li Wei, 2012) and emphasise presenting word meanings and usage within situational contexts (Yuan Guangming & Tang Yanfei, 2006). This suggests a strong correlation among situated learning, vocabulary teaching, and motion graphics, with each reinforcing the others. In mainstream vocabulary teaching practices in classrooms, situated learning has become an essential component, reflecting the principle of learning vocabulary within real-life contexts. Furthermore, situated learning aligns with the approach of incidental

vocabulary acquisition, which supports learners in understanding and mastering vocabulary through situational exposure and use (Penno et al., 2002).

Under the application of situated learning, the design of motion graphics should focus on ‘constructing simulated scenarios with situational context’. The combination of different design properties should not only aim for sensory appeal but, more importantly, serve the purpose of building contextually meaningful scenarios.

In the current teaching materials, a visual analysis of Unit 6 in the Grade 2, second semester, reveals that the entire unit revolves around the theme of ‘seasons’, with each lesson introducing vocabulary related to this theme. In Lesson 3 of Unit 6, the teaching focus is on expressing ‘wearing different clothes in different seasons’ in English, with target vocabulary including various types of clothing. In the motion graphics used in this lesson, the design constructs scenarios such as ‘washing and drying clothes’ and ‘categorizing clothes by season’, effectively embedding the meaning and usage of vocabulary into specific contexts (Figure 81), thus visualizing and contextualizing vocabulary teaching.



Figure 81: Scenarios constructed by motion graphics

This design receives unanimous approval from the interviewed teachers. They emphasise that creating a coherent context throughout the vocabulary teaching process is essential. A unified situational presentation not only facilitates vocabulary comprehension and retention but also enhances the coherence of the lesson and the effectiveness of practical language use.

Therefore, each 40-minute lesson has a specific teaching subject. To ensure the effectiveness of situated learning, the creation of scenarios must closely align with this subject. Every design property of the motion graphics should serve the construction of the scenario, assisting teachers in embedding abstract vocabulary into concrete, real-life contexts, as the teachers required.

In addition, in the teaching plan, teachers often clearly specify the need for particular teaching scenarios, for example, asking students to place items like ‘sweaters’ into a basket labelled ‘autumn’ (Figure 82). These specific situational setups directly influence the content and presentation of motion graphics. The design process must begin with a thorough understanding of these scenario requirements. According to the Coherence Principle of Mayer (2002)’s Cognitive Theory of Multimedia Learning, irrelevant design properties should be avoided. These extraneous elements do not support the instructional goal and can cause cognitive interference, leading students to ‘detach from the scenario’ and ultimately weakening the effectiveness of situated learning.



Figure 82: The particular teaching scenarios

Topic 3: Graphics and photos in visual expression

The visualisation of vocabulary can effectively enhance learners’ memory retention (Stevick, 1996). Images have long been widely used as supplementary tools in language learning. Hill (1990) argued that within the ‘standard classroom’ environment, one that is not inherently conducive to language acquisition, teachers require a variety of teaching aids to stimulate learners’ interest and motivation, with visual imagery serving as a particularly valuable form of stimulus.

In the context of English as a Foreign Language (EFL) learning, images not only assist learners in comprehending word meanings and enhancing memory, but also stimulate associative thinking and facilitate visual recognition and conceptual development (Luruk et al., 2021). Especially in foundational vocabulary instruction, images are particularly effective for beginners due to their immediacy and clarity (Julaiha et al., 2022). Harmer (2001)further noted that visual aids such as pictures play a pivotal role in vocabulary teaching by encouraging learners' active engagement and meaningful construction of knowledge. In EFL teaching, the use of visual media such as images, graphics, and photographs has become a standard practice, and even evolved into informal communicative tools among learners (e.g., memes and emojis).

While extensive research supports the positive role of visual media in vocabulary instruction, existing literature more uses general terms such as 'images' or 'pictures', and rarely differentiates between photographs and graphics, two distinct forms of visual representation, in terms of their specific effects and functions in vocabulary teaching.

According to the visual analysis of the current material, both forms are employed in practice: photographs are mainly used to directly represent concrete nouns, such as 'apple' or 'car', or to depict real-life scenarios. This design approach aligns with the recommendations found in the existing literature on image-based instruction. Especially when conveying complex scenarios, teachers tend to prefer using real-life photographs, as they efficiently communicate large amounts of information and reflect teachers' common practice of selecting relatable visual materials (Chapter 6). However, in real classroom teaching, teachers tend to favour graphics-based visual elements. They believe cartoon-style images are more effective in capturing students' attention, avoiding visual overload, and aligning with young learners' aesthetic preferences and developmental stages. Accordingly, the current material predominantly uses graphics, with photographs employed more sparingly as supplementary elements. This reflects a strategic distinction in visual expression, as well as a controlled aesthetic preference.

Previous studies suggest that photographs are more suitable for presenting concrete, perceptible objects or real-life scenarios, particularly when word instruction requires emphasis on object identification or situational authenticity (Nelson and Schreiber, 1992). In contrast, graphics are considered more flexible and pedagogically adaptable for conveying abstract concepts, character

actions, or narrative progression. While some scholars have noted the difficulty of using photograph to represent abstract vocabulary, such as ‘influence’ or ‘opinion’ (McCarthy, 1990, Thornbury, 2006), other research has shown that images can also facilitate learners’ understanding of abstract notions (Oxford (Oxford and Crookall, 1990, Chapelle, 2006).

In summary, the current research supports the flexible strategy for combining graphics and photographs in the design of motion graphics for teaching purposes: photographs are particularly effective in teaching concrete vocabulary by enhancing semantic recognition and memory, whereas graphics are more suitable for representing characters, interactions, and abstract ideas, helping to reduce learners’ cognitive load and increase classroom engagement. This strategy is not only consistent with the design approach of the current material but also aligns with teachers’ pedagogical preferences and aesthetic considerations.

Topic 4: Instructions for modifying motion graphics

Teachers are not familiar with the complex design of motion graphics in PowerPoint presentations. Although they express a desire to adjust motion graphics based on student feedback and specific teaching contexts, the lack of technical support presents considerable challenges in practice, even leading to the abandonment of attempts to modify the content.

As the visual analysis result, this section does not provide any instructions to modifying motion graphics. To address this issue, teacher recommend that concise modification tips and suggestions specific to motion graphics be embedded within the notes section, thereby enhancing teachers’ ability to independently adjust the graphical content during lesson preparation.

Teachers also emphasise that such instructions should remain brief and accessible in order to avoid increasing the workload or cognitive burden during lesson planning. Furthermore, since teachers may refer to the accompanying lesson plans during preparation, it may be beneficial to incorporate motion graphics modification instructions into each corresponding lesson plan. This approach would not only support teachers in making timely adjustments during the planning phase but also ensure that, during pilot implementation, all participating teachers receive consistent instructional materials and design guidance. Based on this, a test attempt can be proposed: placing the

modification instructions separately into the ‘Notes’ section and the lesson plan, then comparing the applicability of both.

Topic 5: Visual cues and visual consistency

Based on the teachers’ views on visual cues, one type of them presents information through consistent or similar design to guide or trigger students’ learning behaviour. This aligns with the design principle of consistency. Norman (2013) states that the consistency principle means the same interaction always produces the same result, helping users build accurate mental models; when similar parts of a system are expressed similarly, usability and learnability improve, enabling efficient transfer of prior knowledge to new contexts, quick mastery of new content, and focus on task-relevant parts. According to Mayer’s multimedia learning theory (Mayer, 2002), consistency is part of the signaling principle and the coherence principle; the former uses consistent cues to emphasize material structure for deeper understanding, while the latter reduces irrelevant elements to simplify content and lower cognitive load. Clark and Mayer (2023) further point out that consistent use of titles, colours, and layouts reduces learners’ trial-and-error with procedures, helping them focus on understanding knowledge. Norman (2013) also believes coherent design helps users build accurate mental models and aids students in forming stable frameworks in long-term memory. Visual analysis shows that the visual cues mentioned by teachers are applied in current teaching materials, with cues of the same function (such as dialogue boxes) using similar designs, which helps students respond quickly due to consistency and reduces explanation time. Therefore, in designing motion graphics for teaching, designers need to consciously identify if elements with the same function exist across different lessons and adopt consistent visual expressions to reduce students’ cognitive effort in exploring these elements and improve teaching efficiency. Additionally, Williams (2015) suggests that repetition is an effective method to achieve design consistency by linking originally separate parts and enhancing overall unity and coherence; thus, repeated use of visual cues is also important for maintaining consistency.

Another type of visual cue appears in the use of textbook content. Visual analysis shows that current teaching materials use textbook resources in various ways. The reason for this can be surmised as the easiest and most feasible way for teachers, who are not professional designers, to create motion graphics by taking materials from textbooks. Interviewed teachers also indicate

that using textbook content helps students visually connect classroom learning with the textbook, avoiding confusion caused by unfamiliarity. Therefore, designers need to consciously incorporate textbook materials in motion graphics. Specifically, key content, new knowledge explanations, and repeated practice sections should include visual elements from the textbook, especially in vocabulary teaching, where textbooks often explain concrete meanings of words visually. Vocabulary learning requires repeated practice, so multiple forms of expression should be provided, with textbook materials serving as one option. However, the entire teaching process should not rely solely on textbook materials, to maintain novelty and keep students engaged. Additionally, visual analysis shows that motion graphics often maintain consistency with textbook-specific characters. These characters appear throughout English learning in primary school, and students recognize their source, clearly linking classroom content with the textbook, reducing detachment, and enhancing learning coherence.

Topic 6: Intuitiveness of visual expression

In the learning process, intuitive thinking serves as an important way to acquire knowledge. Intuition can be understood as the ability to gain knowledge directly without relying on conscious reasoning or systematic analysis, often emerging as a sudden insight built upon accumulated experience(Glöckner and Witteman, 2009, Cholle, 2011). It functions as a rapid, holistic cognitive process that allows individuals to grasp the essence of a problem directly.

In teaching practice, Haijian (2024) emphasise the ‘intuitive and digital’ teaching, believing that using visualisation stimulates learning interest and improves classroom efficiency, especially in primary education. This should be the core advantage of motion graphics as a teaching tool: their strong visual expression makes abstract knowledge more intuitive and understandable. Therefore, to maintain this advantage, the visual expression of motion graphics should stay as direct and clear as possible.

From teacher interview results, teachers note that the cognitive development stage of second-grade students means they prefer to understand and receive information intuitively. Teachers stress the directness and clarity of visual presentation, which may be an important way motion graphics activate students’ intuitive cognition. This shows that students’ intuitive, visual way of understanding directly affects the design requirements for motion graphics:

all visual information in motion graphics should be presented in a direct and clear way to reduce cognitive load and enhance understanding and interest. In contrast, overly complex or ambiguous visuals not only increase the difficulty of understanding but may also cause resistance or decreased interest. At the design aspect, this means that all design properties in motion graphics should convey the intended information intuitively and accurately, avoiding visual metaphors or analogies that may cause confusion. Unless required by specific content to guide students to make guesses, direct visual expression is recommended to maintain teaching intuitiveness and fully realise the instructional potential of motion graphics.

Topic 7: The impact of familiarity

Building upon the principle of consistency (Topic 5), 'familiarity' offers a deeper lens on student engagement. As confirmed by teacher interviews and cognitive science (Giora, 2003), familiar content is processed more efficiently. This is because, as established in the discussion of cognitive load, familiar elements allow students to activate existing knowledge, thereby freeing up working memory for new information. This effect applies not only to language but also to visual information, where familiar visual patterns are processed more rapidly. This cognitive mechanism suggests using 'familiarity in design' to improve learning efficiency. By employing familiar characters, repeating consistent visual cues (as detailed in Topic 5), and maintaining a consistent design style, a sense of continuity is built.

However, teachers cautioned against overly monotonous repetition, which creates a 'formulaic' learning experience. Therefore, a key design strategy emerges:

- For functional visual elements (e.g. visual cues): consistency and repetition are key to leveraging the benefits of familiarity.
- For core content and key interactive activities, variation is necessary to maintain interest and avoid cognitive inertia.

Topic 8: Text

The visual analysis of text design shows that text size, colour, and font are the main influencing factors.

Text size: analysis indicates that while the font size of the main content varies, the size of functional text (headings, page numbers) remains consistent. This provides a concrete example of the principle of consistency (Topic 5), helping students form stable reading expectations. However, the lack of a systematic approach to the main content suggests areas for further standardisation.

Text colour: whilst the current materials meet basic readability requirements, the use of red for highlighting warrants further investigation, particularly given its potential to bring negative associations in learning contexts (Elliot et al., 2007, Rutchick et al., 2010). Red can focus attention on details (Mehta and Zhu, 2009) and is frequently associated with errors. Given that the symbolism of colour is also culturally dependent (Taylor et al., 2013), the use of red as the highlighting tool should be reconsidered in favour of alternatives that support direct attention without carrying potential negative emotion.

Font (typeface): the choice of font is predetermined by local education ministry requirements, thus no changes are proposed.

Topic 9: Colour

Teachers indicate that students generally prefer highly saturated, vivid colours. This aligns with the findings of Valdez and Mehrabian (1994), who report that younger learners tend to favour bright, lively hues (such as pink, red, bright green, turquoise, and yellow) over darker shades (such as brown, dark blue, dark green, and black). According to teachers, vibrant colours are perceived to be more effective at capturing students' attention, eliciting positive responses, and thus enhancing classroom engagement and enjoyment. However, based on the interview results, no dominant colour scheme or standardised approach to colour usage can be recommended at this stage.

6.3 Phase 1 Outcome: design insights from Part 1, 2 and 3

Based on the above research, this section presents the core design insights that have been identified: (For a detailed description of specific design guidelines corresponding to each 'topic', please refer to the appendix.)

Insight 1: Motion graphics design aligns with attention changes

Initial engagement (first 5 mins - involuntary attention):

Strategy:

- Immediately capture attention with high-impact stimuli.

Guidelines:

- Use short video clips or animations as openers.
- Employ strong visual contrasts (size, colour) and novel elements.

Peak attention (5-20 mins - voluntary attention):

Strategy:

- Deliver core content with maximum clarity and minimal distraction.

Guidelines:

- Simplify layouts; use sample white space.
- Reduce decorative elements.
- Use motion effects purposefully to demonstrate key concepts.

Declining attention (20-35 mins - sustaining voluntary attention):

Strategy:

- Re-engage students with structured, interest-driven interactive activities.

Guidelines:

- Incorporate elements of direct interest (e.g., popular characters) and indirect interest (e.g., competitive games).
- Ensure visual design is rich to support varied interactions.

End of lesson (final 5 mins - alternating attention):

Strategy:

- Recaptures wandering attention by alternating between involuntary and voluntary tasks.

Guidelines:

- Reintroduce high-stimulus media like video clips for review.
- Use diverse, task-oriented activities for assessment.

Insight 2: prioritise clarity & reduce cognitive load

Strategy:

- Ensure all visual and textual information is clear, direct, and serves the instructional goal.

Guidelines:

- Visual accuracy: ensure visuals (graphics, photos) are accurate and

match students' cognitive experiences. Motion speed should match the student response pace.

- Information clarity: avoid ambiguous visuals, incorrect information, or disorganised visual hierarchy, especially during interactive tasks.
- Text readability: use standardised font sizes for functional text. Ensure high contrast between text and background.
- Coherence principle: avoid adding design properties unrelated to the theme to prevent cognitive interference.

Insight 3: leverage consistency & familiarity

Strategy:

- Use consistent and familiar elements to reduce cognitive exploration and speed up understanding.

Guidelines:

- Functional consistency: use identical or similar designs for elements with the same function across all lessons.
- Content familiarity: proactively integrate visual elements from the textbook to create a better learning experience connection between the classroom and course materials.
- Stylistic continuity: maintain a consistent graphic style, colour palette, and sound design to build a sense of familiarity and expectation.

Insight 4: design for intuitive understanding

Strategy:

- Visual elements should be understood directly and quickly, aligning with students' cognitive preference for intuitive thinking.

Guidelines:

- Prefer graphics over photos for concepts: use graphics for actions, interactions, and abstract ideas. Use photos for concrete objects and realistic scenarios.
- Avoid complex metaphors: unless the goal is to encourage guessing, use direct visual representations. Avoid ambiguous analogies that may cause confusion.
- Embrace simplicity: a simple, clear visual is more effective than a complex, overloaded one.

Insight 5: construct meaningful contexts (situated learning)

Strategy:

- Embed vocabulary and language practice within a coherent, theme-

based, and life-related scenario.

Guidelines:

- Thematic coherence: ensure every design element serves the construction of the lesson's central theme.
- Contextual accuracy: motion graphics should accurately present the scenarios required by the lesson plan and interactive activities.

Insight 6: empower teacher modification

Strategy:

- Provide tools and guidance to help teachers adapt the materials.

Guidelines:

- Embed concise, accessible modification tips directly into the PowerPoint 'notes' section.
- Integrate corresponding modification guidance into the written lesson plans for consistent implementation.

Chapter 7 | Phase 2 data collection and analysis

7.1 Introduction

Chapter 7 presents the process and results of Phase 2 data collation and analysis in this study. The detailed process is as follows (Figure 83):

Based on the design insights identified in Phase 1, corresponding design prototypes (PROTOTYPE 1) are created as initial materials for testing. Since the prototypes would be applied in real classroom teaching, a round of REVIEW INTERVIEWS is conducted with teachers before presenting the prototypes to students (respond to RQ3). These interviews enabled teachers to review the content for accuracy and provide suggestions for refinement to prevent potential misinformation or confusion caused by the motion graphics.

After the REVIEW INTERVIEWS, the comments are analysed and used to modify the design prototype, resulting in PROTOTYPE 2. This version is then used in the first round of iterative contrast classroom testing. In this test, the design prototype and the current teaching material are applied to two different classes, both covering the same lesson content. The class using the current teaching material is referred to as the ‘experimental class’, while the class using the design prototype is referred to as the ‘control class’. During the lessons, participating teachers observe students based on specific observation objectives and assess their learning outcomes. After the first round of teaching, the teachers are invited to participate in FEEDBACK INTERVIEW 1 (respond to RQ2 and RQ3), where they share their reflections on using the prototype, along with their observations of students’ classroom behaviours. The teachers also offer suggestions for further improvement of the prototype design.

Based on the analysis of these interviews, the design is revised again, resulting in Prototype 3, which is then used in a second round of contrast testing, following the same format.

After the second round, participating teachers are again interviewed in FEEDBACK INTERVIEW 2 (respond to RQ2 and RQ3) to gather their impressions and evaluations of the updated prototype. The results show that teachers are generally satisfied with the design of Prototype 3. Following these iterative rounds of testing and data collection, the research proceeds to the final synthesis and discussion stage (respond to RQ4).

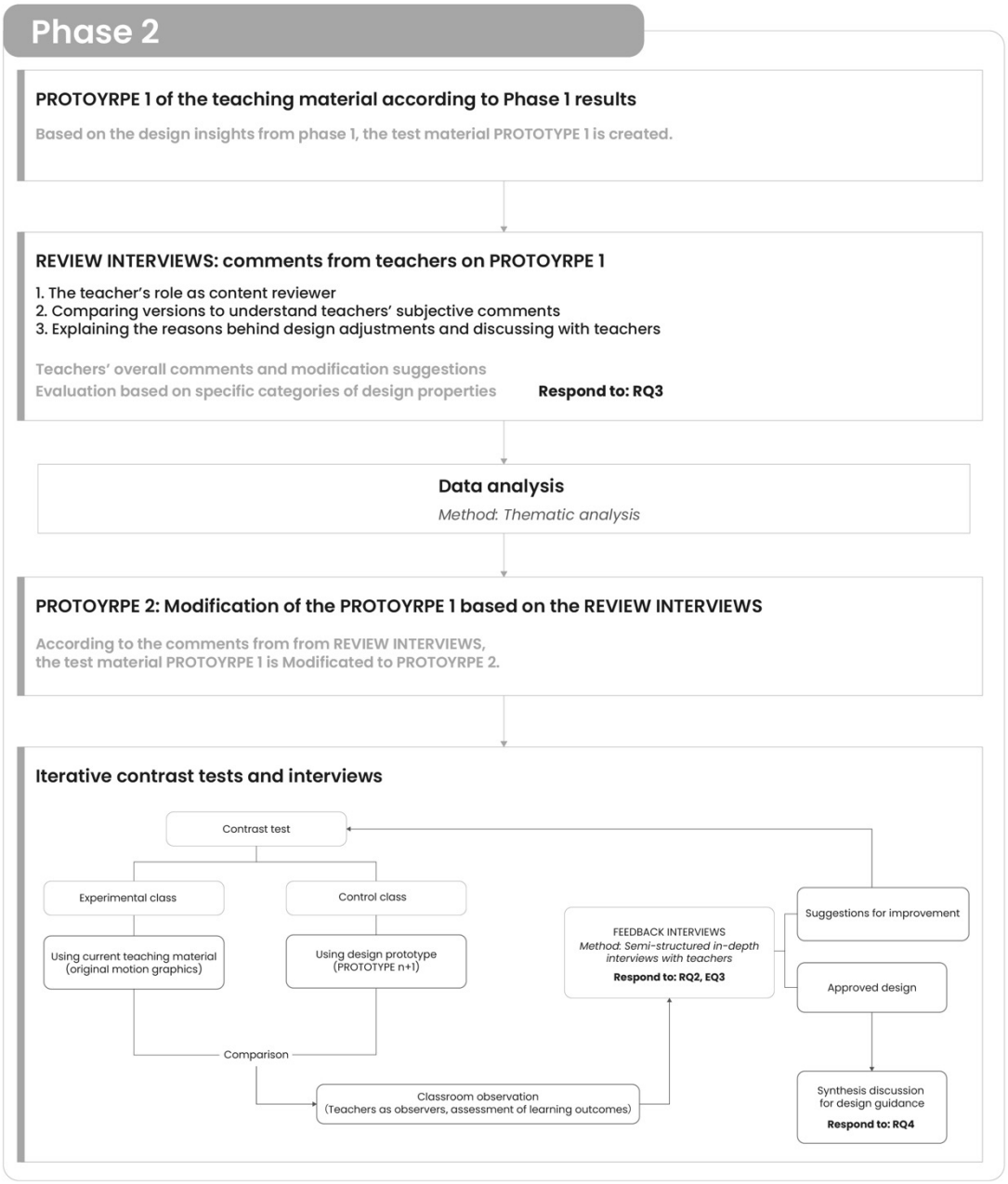


Figure 83: The process of Phase 2

7.2 PROTOTYPE 1 of the teaching material according to Phase 1 results

Based on the design insights above, this research develops the test material PROTOTYPE 1. The following section presents the specific practical design applications in PROTOTYPE 1 and explains the related design insights and testing purposes to ensure alignment between the design rationale and validation goals. It is important to emphasise that these design insights can lead to multiple practical design applications. However, due to the impossibility of organising students into separate experimental groups in an artificial setting with strictly controlled variables, and to reflect real classroom conditions, the prototype testing is conducted in real classroom lessons. Consequently, the design of the test material is subject to limitations: the number of tests, the school's teaching schedule, and curriculum requirements. This research selects the possible design applications for testing as preliminary evidence to support the validity of the proposed design insights. According to the school's teaching plan, the content used in PROTOTYPE 1 is taken from Unit 6 in the second semester of Grade 2.

The following design examples are shown in PROTOTYPE 1, corresponding to the design insight:

Topic 1: Motion graphics design, lesson flow and attention

Design guideline (in topic):

(3) Visual accuracy and support interactive activities, maintain voluntary attention:
Graphic content closely aligns with interactive activities.
Visual design ensures visual accuracy and cognitive compatibility.

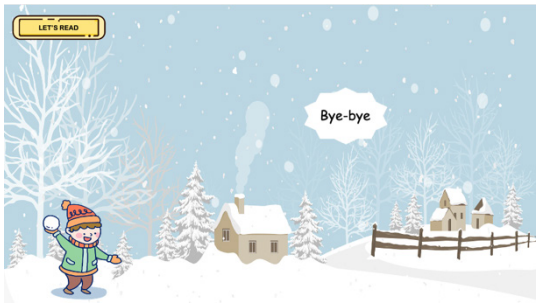
Practical design application:

The scenario setting in PROTOTYPE 1 is retained, with increased colour saturation. The shape of the snowflake is refined to be more concrete and aligned with the public's typical visual perception.

Testing set up:

To test whether increased accuracy of visual elements has a more positive effect on student engagement in the classroom, i.e., effectively maintaining students' attention.

Current teaching material vs PROTOTYPE 1:





Design guideline (in topic):

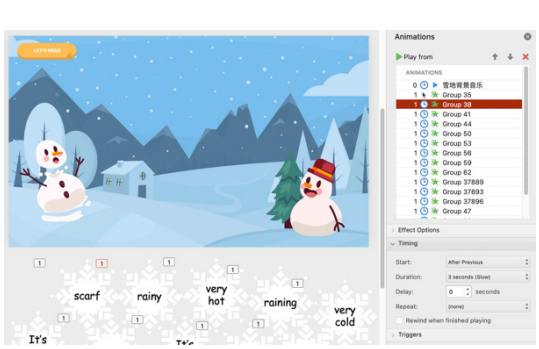
(3) Visual accuracy and support interactive activities, maintain voluntary attention:

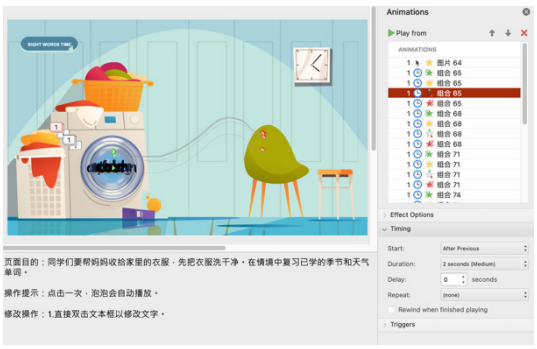
- The speed of motion effects should match the students' response pace.

Practical design application 1:

The speed of the 'snowflake-falling' motion effect (3 seconds) in Lesson 1 compared to the 'bubbles' motion effect speed (2 seconds) in Lesson 3. Continuous automatic display trigger of motion effects

Lesson 1 and Lesson 3 in PROTOTYPE 1:

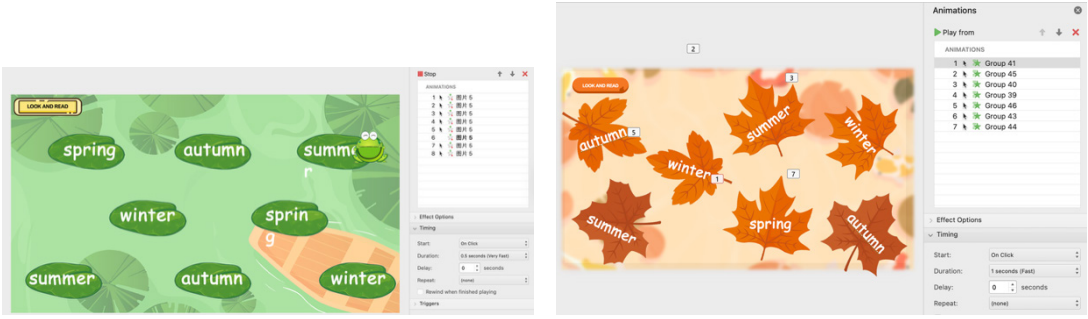




Practical design application 2:

In Lesson 2, the ‘leaf-falling’ motion effect lasts for 1 second, longer than the ‘frog jumping’ time in the current material (0.5 seconds), considering a realistic pace consistent with life experience. The each ‘leaf-falling’ motion effect are triggered by the teacher

Current teaching material vs PROTOTYPE 1:



Testing set up:

To form a comparison in the knowledge review section, testing whether motion effects should play continuously or be teacher-controlled, as well as comparing students’ response time and the duration of the motion effects (1, 2 or 3 seconds).

Design guideline (in topic):

(4) Reducing florid expressions for new content instruction:

- Motion design avoids overstimulation.
- Use white backgrounds to enhance content visibility.

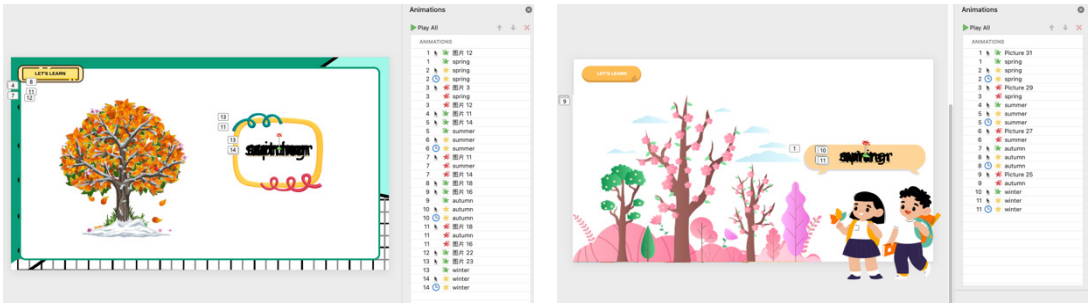
Practical design application:

In Prototype 1, while maintaining the use of a white background, reduce the number of motion effects used.

Testing set up:

To test the impact of the amount of motion effects on teaching effectiveness based on the use of a white background, with the requirement to reduce florid expressions.

Current teaching material vs PROTOTYPE 1:



Design guideline (in topic):

(4) Reducing florid expressions for new content instruction:
Use motion effects only to emphasise key content.

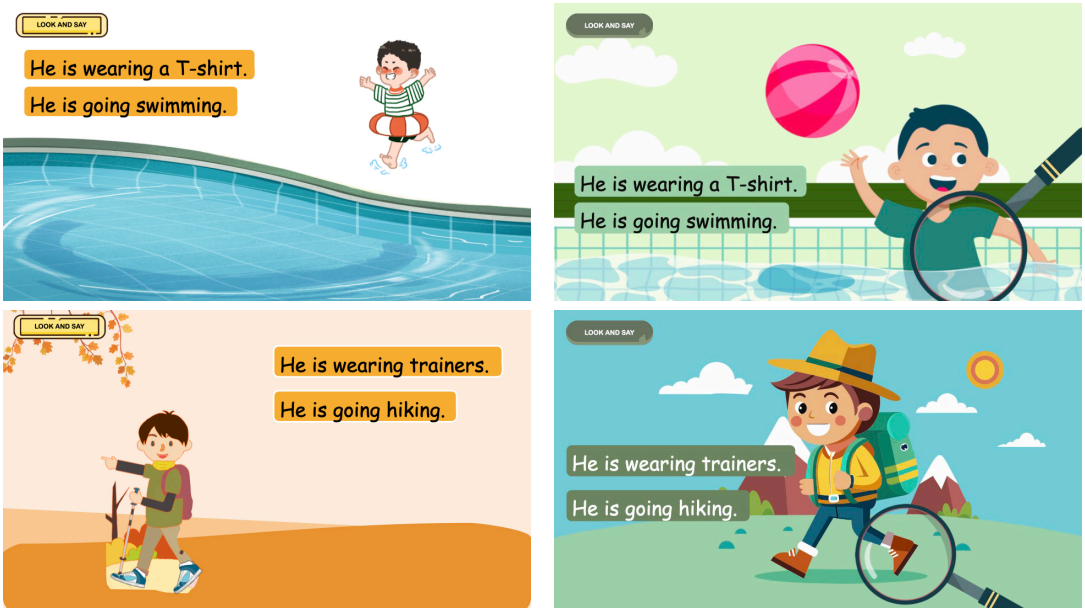
Practical design application:

In prototype 1, the motion effect is added to the highlighted clothing under the magnifying glass, instead the motion effect applied on decorative visual elements in the current material.

Testing set up:

To test whether selectively applying motion effects to key learning content, while reducing unnecessary effects, can be positive effect for teaching.

Current teaching material vs PROTOTYPE 1:



Design guideline (in topic):

(5) Support interactive activities, enhance voluntary attention:

- Familiar cartoon characters are used to make interactive activities more engaging for students.

Practical design application:

In PROTOTYPE 1, ‘Doraemon and Nobita’ are replaced with generic student characters.

Testing set up:

In the current material, all three interactive activities use “Doraemon and Nobita” (characters from a Japanese animation) as guides in the motion graphics. Interviewed teachers speculate that the material’s designer assumed these characters are still well-known and popular among students. However, some teachers believe that these characters are outdated and that today’s students may not necessarily be familiar with or interested in them. By comparing with the current material, the aim is to assess whether using cartoon characters better captures interest and helps maintain voluntary attention.

Current teaching material (top row) vs PROTOTYPE 1 (bottom row):



Design guideline (in topic):

(6) Maintaining two facets of attention:

- Use diverse interactive activities to support the output and assessment phase.
- Motion graphics in PowerPoint serve as tools for task guidance and attention triggering.
- Video clips can be reintroduced.

Practical design application:

Prototype 1 retains the various forms of interactive activities used in the current material, such as classifying shoes with students, reading aloud based on visual content, and using a spinning wheel game for word recognition. At the same time, the visuals are modified to align with students' aesthetic preferences.

Testing set up:

To confirm whether using various forms of interaction can better support students' learning and whether patterns that match their preferences can enhance their classroom participation.

Current teaching material vs PROTOTYPE 1:



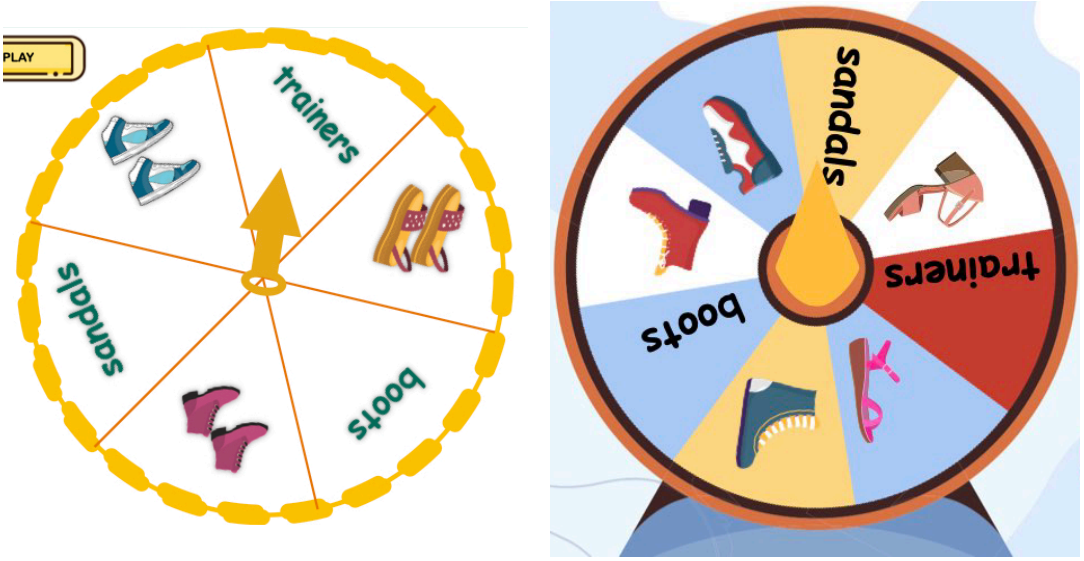
Practical design application:

In the visual design of the spinning wheel game, the wheel is made more concrete and explicit in its interactive content.

Testing set up:

Comparison to test whether students become more engaged with a clearer and more specific visual presentation.

Current teaching material vs PROTOTYPE 1:



Practical design application:

In the lesson where animation is used again in the current material, Prototype 1 continues to use the same animation and incorporates graphics to simulate a real playback platform.

Testing set up:

To confirm whether using animation again at the end of the lesson can effectively maintain students' attention.

Current teaching material vs PROTOTYPE 1:





Topic 2: Motion graphics and situated learning in the classroom

Design guideline (in topic):

Thematic relevance and contextual consistency

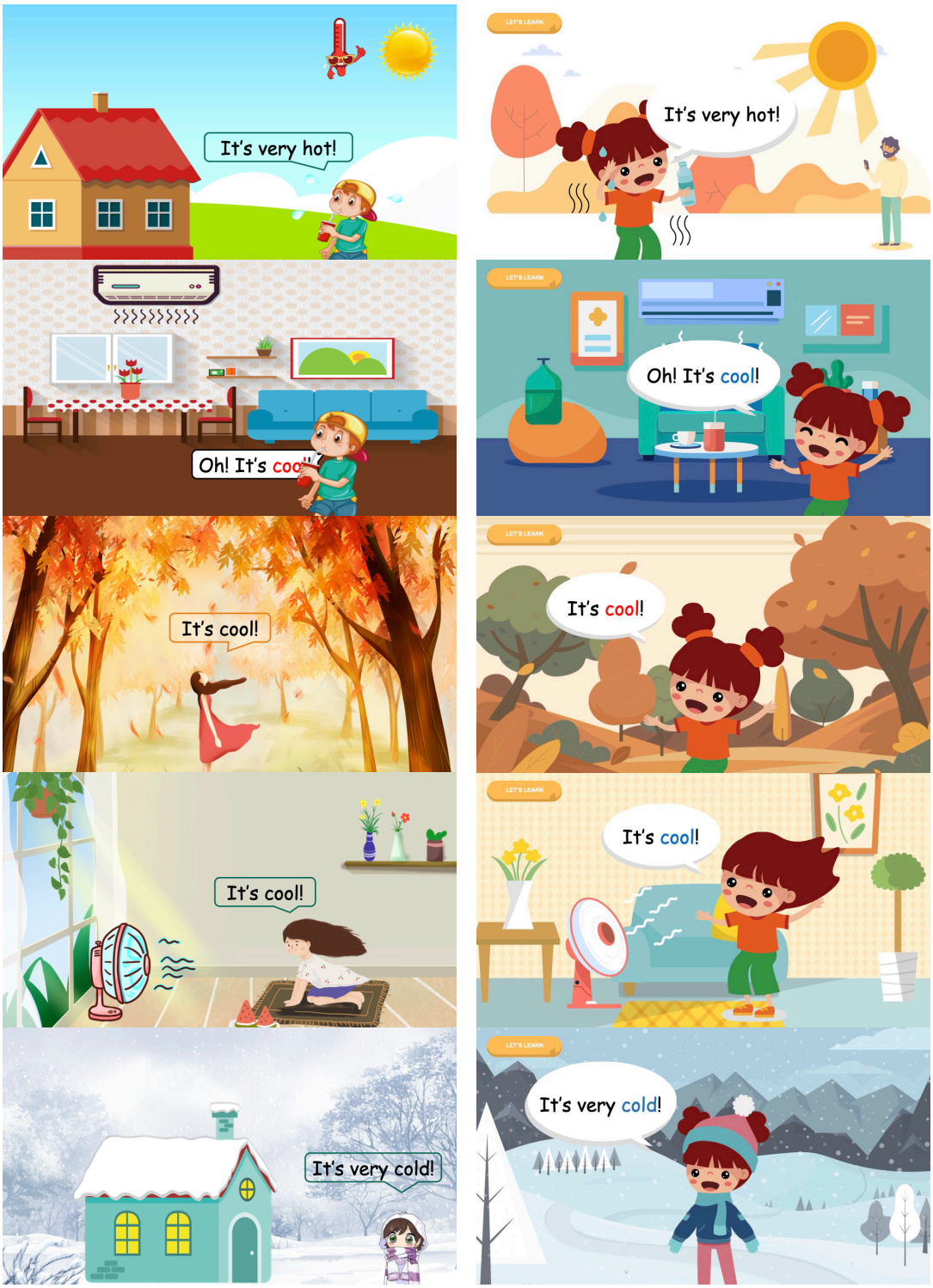
Practical design application:

In PROTOTYPE 1, the same girl character is used throughout all scene transitions, allowing students to connect with a single protagonist across different seasonal settings. This enhances thematic coherence. At the same time, the scenarios are redesigned to be completer and more integrated, compared to the element collage in the current material.

Testing set up:

To test whether coherent design of characters and scenarios in motion graphics, combined with situated learning, better supports students' understanding of the scenario and the meaning of the vocabulary.

Current teaching material vs PROTOTYPE 1:



Design guideline (in topic):

Connecting scenarios to students' real-life experiences

Practical design application:

In the current teaching material, the meaning of “warm” is illustrated in the motion graphics using elements such as a fireplace and hotpot. However, most of the students are from Guangzhou in southern China, where the climate is relatively warm. Local homes typically do not have fireplaces, and hotpot is not an everyday meal. As a result, this representation may not align well with students’ real-life experiences.

In PROTOTYPE 1, the scenario is changed to show a family having a meal together in a warm indoor environment, and an outdoor scenario of the family taking a walk in long-sleeved clothing. Warm colour tones are also used to enhance the feeling of warmth.

Testing set up:

To test if the visual design is more relatable to the students’ life experiences, whether making it easier for them to understand the meaning of the word “warm.”

Current teaching material vs PROTOTYPE 1:



Topic 3: Graphics and photos in visual expression

Design guideline (in topic):

Photos are ideal for present realistic scenario and delivering information-dense content.

Practical design application:

For scenario presentation, the connection between object words and seasons is shown using both photos and graphics.

Testing set up:

By comparison, this tests whether photos convey scenario better than graphics when their use for the same goal.

Current teaching material vs PROTOTYPE 1:





Topic 4: Instructions for modifying motion graphics

Design guideline (in topic):

Motion-specific modification tips directly into the ‘Notes’ section of each slide

Practical design application:

In PROTOTYPE 1, operation tips for modifying motion graphics in PowerPoint are added to the ‘Notes’ section and also included in the lesson plan.

Testing set up:

Allowing teachers to compare both options and choose their preferred format of the presentation of modifying instructions.

PowerPoint ‘Notes’ section vs Lesson plan:



Page Purpose:
To present a variety of typical seasonal images (e.g., clothing, nature, activities) and guide students to say: *"It's spring/summer/autumn/winter."* This activity is designed for practicing the vocabulary of the four seasons.

Operation Guide:
A student character appears automatically, followed by a speech bubble displaying "It's...". The seasonal word appears with an animation lasting approximately 2 seconds.

First Click: The option *autumn* shakes to prompt students to recognize and choose *autumn* based on the image.

Second Click: The image switches to a summer scene.

Third Click: The option *summer* shakes.
The same pattern continues: the image changes, followed by the corresponding word shaking to draw attention.
After all images have been shown, clicking proceeds to the next slide.

Editing Instructions:
Double-click the text box to modify the displayed text directly.

Lesson plan

Subject:	English	Unit:	6	Time:	45mins
Grade:	2	Term:	2nd	Lesson:	01
Teacher:		Students:			

Spelling content and objectives:

Alphabet pronunciation tips + letter w pronunciation in words

a. Can say the alphabetical phrases
b. Can correctly pronounce the letter w in words.

Textbook content and objectives:

a. Can hear, read and understand the words: spring, summer, autumn, winter, warm, cool, make a snowman.
b. Can describe the weather in different seasons, e.g. It's warm in spring.
c. Can understand, read aloud and act out the words on page P55.
d. Can recognise the words: make

Slides	Time	Teaching objectives	Teaching activity	Teacher's Line
12		Review US vocabulary, focusing on high-frequency and thematic words about the weather.	In a snowy scenario, words are pasted into the falling snowflakes. The teacher needs to guide the students to read the displayed words according to the snowflakes that appear.	Look, it's snowing! Let's read aloud the words on the snowflake!
		PPT operation tips	PPT modification tips	
		Music plays automatically in the background, clicking once and then autoplaying as snowflakes fall.	1. Double click the text box to modify the text. 2. Modify the falling speed of the snowflake: open the animation module, select the animation panel, select the snowflake that needs to be adjusted (a group), click on the "time" after selecting, select the " duration" to adjust the time.	

Slides	Time	Teaching objectives	Teaching activity	Teacher's Line
14		Let the students learn the new word cool through somatic senses.	Let the students watch the little girl go from the hot outside of the house (VERY HOT) into the cool air-conditioned room (COOL)	Everyone looks at the girl and she says, It's very hot!
		PPT operation tips	PPT modification tips	
		Autoplay. The little girl enters the screen. Say "It's very hot". The dialogue bubble disappears and the little girl leaves the screen.	1. Double-click the text box directly to modify the text. 2. If you delete the horn symbol outside the screen, you can delete the recording. 3. To adjust the speed, open the animation module, select the animation panel, select the corresponding action number, select	

Topic 5: Visual cues and visual consistency

Design guideline (in topic):

Maintaining consistent visual cues in design

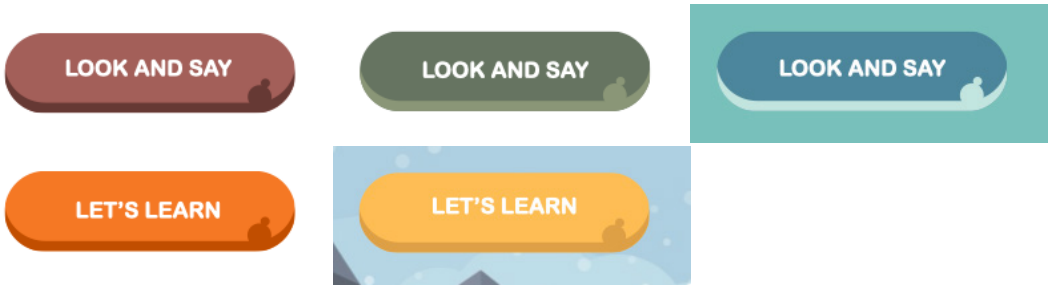
Practical design application:

In PROTOTYPE 1, follow the colour scheme of the different lessons, using a similar design in the Section indicator.

Testing set up:

To test whether designing functional elements with continuity can serve as visual cues to facilitate teaching and learning.

Section indicators in PROTOTYPE 1:



Topic 8: Text

Design guideline (in topic):

Other colours (non-black and white): used as accent colours to highlight content that needs special attention, such as keywords in classroom teaching, providing the visual cues.

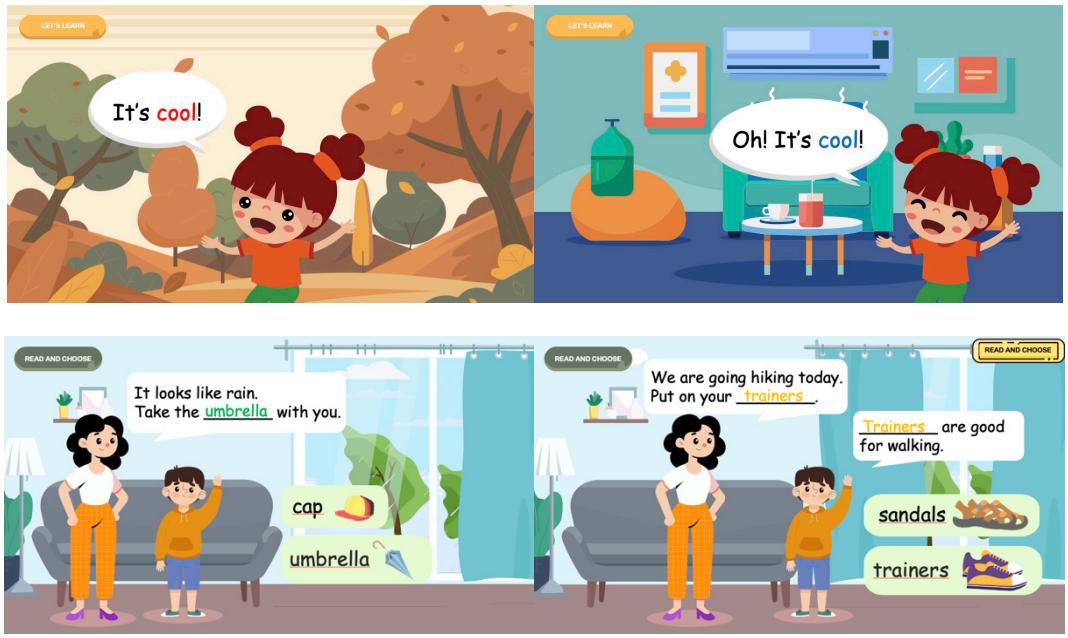
Practical design application:

In PROTOTYPE 1, the highlighting of key content employed red, consistent with the current teaching materials, along with additional contrasting colours.

Testing set up:

To compare and test whether colours other than the generally used red can provide the same content highlighting function.

Different colour highting in PROTOTYPE 1:



Topic 9: Colour

Design insight: No dominant colour scheme or standardised approach to colour usage can be recommended.

Practical design application:

Each lesson adopts a variety of colour schemes with distinct tendencies:

1. Element-based colours: primarily use colours that directly match the elements depicted (e.g., objects, characters), without a dominant colour scheme.
2. Yellow-orange dominant scheme
3. Blue-dominant scheme
4. Green-dominant scheme
5. Red-dominant scheme

Testing set up:

By applying slides with different dominant colour schemes, the test aimed to test whether teachers and students would show clear preferences, comments, or emotional responses toward certain colour style.

Different colour schemes in prototype 1:





Practical design application:

In the functional slides, Lesson Opening, Learning Content, and Learning Objectives, the colour use varies according to the specific colour schemes of each individual lesson, while the layout design remains consistent.

Testing set up:

In contrast to the current teaching materials (the same colour scheme is applied to the functional slides across all lessons), this test attempts to determine whether the continued use of colour within functional slides has any impact on teaching and learning.

Functional slides in prototype 1:



Practical design application:

Remove the decorative borders with colour continuity and instead use non-border decorative elements based on the colour scheme of each lesson, aiming to support scenario expression.

Testing set up:

To test whether removing decorative elements that use the same colour across different lessons, thereby eliminating the colour continuity embedded in these elements, has an impact on teaching effectiveness.

Current teaching material vs PROTOTYPE 1:



7.3 REVIEW INTERVIEWS: comments from teachers on PROTOTYPE 1

7.3.1 Collecting comments from teachers through interviews

Comments collection adopts semi-structured in-depth interviews as the data collection method. The main objectives of REVIEW INTERVIEWS are:

1. **The teacher's role as content reviewer**
   Teachers are invited to serve as content reviewers, focusing on checking whether there are any inappropriate elements among all the visual and auditory design components used in the new design. During the interviews from Phase 1, it is noted that teachers are generally cautious about various elements appearing in motion graphics. Considering that the target audience is lower-grade students, teachers need to ensure that all content aligns with their teaching standards and school regulations to avoid potential negative impacts.

2. **Comparing versions to understand teachers' subjective comments**
   By comparing the old and new versions of the motion graphics, the interviews aim to understand teachers' subjective feelings of the new design. During the interviews, teachers are encouraged to evaluate the new design based on their own teaching styles and specific needs. Since the participants have already taken part in the Phase 1 and are familiar with the research purpose and process, and the new design is created based on their previous comments, teachers can provide targeted opinions and suggestions based on their experience with the old version.

3. **Explaining the reasons behind design adjustments and discussing with teachers**
   Although the design adjustments are made according to teachers' suggestions and needs, the designers are not teaching professionals and have not actually used the PowerPoint slides in classroom settings, so their understanding and judgment may differ from those of teachers. Therefore, when teachers raise objections to the new design, the designer (interviewer) explains the considerations behind the adjustments to promote mutual understanding. Furthermore, the designer and teachers discuss the teachers' actual needs in more depth to jointly seek optimization solutions that better fit real teaching.

The REVIEW INTERVIEWS are also conducted in Cantonese. Anonymous in the same manner, using pseudonym (e.g., Teacher A). The interviews are also conducted in a mixed format, either online or in person, depending on the teachers' availability.

7.3.1.1 Profile of participants

There are 4 participants in total, they all participated in the Phase 1 interview. The following table (Table 3) provides an overview of the direct participants and their corresponding indirect participants of feedback collection:

Date of interview	Direct participant	Format of the interview	Duration of interview	Indirect number of participants	Teaching across subjects	As class supervisor
2 June 2024	Teacher A	Online	01:32:03	85 (2 classes)	No	No
13 June 2024	Teacher D	In person	59:58	78 (2 classes)	No	No
12 June 2024	Teacher E	Online	01:50:40	86 (2 classes)	No	No
8 June 2024	Teacher F	Online	01:54:27	86 (2 classes)	Yes	No

Table 3: Overview of the participants

7.3.1.2 REVIEW INTERVIEWS process design

To ensure a comprehensive and structured evaluation of the new design, the interview process is organized into two main parts:

- **Teachers' overall comments and modification suggestions**
  At the beginning of the interview, teachers are invited to freely share their overall impressions and any specific suggestions regarding the new design. This open-ended part allows teachers to highlight particular aspects they find noteworthy or concerning. Providing a period for unstructured feedback ensures that any spontaneous reactions or strong opinions are captured before moving into discussions.

- **Evaluation based on specific categories of design properties**
  Following the free discussion, the interview proceeds to a more structured evaluation based on different categories of design properties. This approach serves two purposes:

1. It offers a clear framework to elicit teachers' evaluations, helping them reflect systematically on different design properties.
2. It assists teachers who may have had less immediate feedback in the earlier part, or who express their thoughts more effectively with prompts.

Based on the previously defined categories of design properties in motion graphics, teachers are invited to comment on the following aspects:

- **Graphics**: Whether the types of graphics, the colour schemes, and the choice of characters or illustrations are appropriate and avoid potential misunderstandings.
- **Text**: Whether the colour, size, and positioning of text clearly and effectively convey the intended instructional content.
- **Animation**: Whether the placement and duration of animation (video clips) within the PowerPoint sequence appropriately support the teaching flow.
- **Photographs**: Whether the use of photographs aligns with the specific teaching contexts and instructional purposes.
- **Motion Design**: Whether the movement, speed, and timing of visual elements effectively enhance the delivery of teaching activities.
- **Sound**: Whether the application of sound effects appropriately supports and enriches instructional activities.
- **Footages**: Whether the placement, type, and duration of unmodified footages within the PowerPoint sequence effectively contribute to instructional delivery. (As with animations, existing footages are not modified in the new design due to time constraints. Footages, treated as one type of design property within motion graphics, are evaluated based on their timing, type, and the amount of class time they consume within the PowerPoint presentation.)
- **Material from the Textbook**: Whether the use of textbook materials effectively facilitates student understanding and whether they are accurately integrated into teaching content.

Specific questions such as 'Do you think there is anything incorrect about the photographs used in the textbook?', 'In terms of sound effects, do you think they help students understand the content?'

7.3.2 Results of the REVIEW INTERVIEWS

7.3.2.1 General comments from teachers

The following is the result of the REVIEW INTERVIEWS. Comparing it with the outcome of phase 1, this section highlights new insights and discoveries that offer depth (a detailed analysis report can be found in the appendix):

Deepened findings

1. The impact of design properties on student attention and learning outcomes

- **The impact of animation and motion design on students' attention and learning outcomes**: according to teachers, lower-grade students respond more slowly, so it is necessary to slow down motion effects to give them enough time to think and understand. The playback speed of motion effects needs to be properly controlled, 'not too fast and not too slow.' (Teacher F) If the motion effects move too quickly, students may fall behind and fail to effectively review or understand the information. Additionally, teachers also note that the current animation styles appear outdated and need to be refreshed in order to improve visual impact and increase student interest.

- **The promotion of cognition and interest through scenario and context design**: a nuanced finding is that students tend to focus more on the overall scenario in the image rather than on the appearance of individual characters.

- **Application of sound and voice-over in motion graphics**: teachers specified that a main issue with current audio recordings is the speed: 'Sometimes it's so fast that the children can't keep up.' (Teacher A). Regarding the use of voice-overs, teachers believe 'not every sentence needs to be voiced.' (Teacher F) Voice-overs should be selectively applied based on instructional needs. Alternating between different audio sources (e.g., recorded voice and teacher explanation) helps maintain student attention and encourages active listening. Playful sound effects can also boost student engagement and even prompt imitation, increasing classroom interaction: 'For example, with sounds like knocking or explosions, some children want to imitate them.' (Teacher F)

- **Use of multiple design properties to enhance classroom engagement and understanding**: Teachers highlighted the importance of variety in practice activities. Varied formats (such as illustrated questions, multiple-choice items, or dialogue-based tasks) can increase students' focus and participation. However, this variety must be carefully managed. When activities are too repetitive, students may become bored and disengaged. Also, excessive variation may lead to cognitive overload, making it difficult for students to adapt quickly and potentially confusing new knowledge.

2. Student Characteristics and Learning Needs

- **The impact of familiar visual content on students**: teachers elaborated that the effectiveness of familiar characters is time sensitive. Not all cartoon characters (e.g., Doraemon) appeal to the current generation of students. In contrast, contemporary popular characters tend to trigger stronger excitement and engagement. A new warning is also raised: while familiarity can boost attention, it may also lead to distraction. The emotional attachment students feel toward these characters can provoke off-topic conversations or disruptive behaviours, for example, discussing the character's personality, voice actor, or background story, which may affect classroom discipline and interrupt the teaching flow.

New findings

1. Student-preferred (highly responsive) modes of interaction: in this interview, teachers highlighted a new and popular interactive method, allowing students to control the motion graphics themselves. For example, students can tap on images during a picture-word matching activity to trigger motion effect on the screen, which enhances engagement and participation.

2. Teachers' needs for the use and design of motion graphics

- **Continuous auto-display & step-by-step clicking**: teachers expressed a specific, differentiated need for motion effect trigger control. For frequently used content, such as vocabulary or dialogue, they prefer an automatic and continuous display to prevent students from becoming distracted: 'If we click every time, students may lose focus if they can't keep up with the teacher's pace. But if the display rhythm is pre-set, like showing one word

in every few seconds, students will follow along like singing.' (Teacher F) This reduces the teacher's operational burden:

'There are too many clicks. Can it just be set to pop up a word automatically, so I don't have to keep clicking?' (Teacher E)

'The operation becomes smoother. I just click once, and the items appear in sequence.' (Teacher F)

However, when teaching new content, teachers prefer to retain manual click control to better manage the pacing: 'if it's fully automatic, I can't control the speed.' (Teacher F)

- **'Notes' section in PowerPoint**
  Regarding the provision of modification instructions, teachers provided new feedback on their actual usage. Due to heavy workloads and limited time, teachers remain reluctant to edit motion graphics, and modifications are still relatively rare. The most common method is deletion, teachers often simply remove unsuitable content:

'Teachers usually skim through the PowerPoint before class and then teach. Few teachers actually read the lesson plans in detail.' (Teacher F)

3. Specification of the visual design of text

- **Font size**: teachers believe that using font size 32 for dialogue text is generally readable. The minimum recommended font size is 28, especially to ensure clarity for students seated at the back. For prompts or subtitles, smaller fonts may be acceptable: 'font size can be smaller, size 24 is still readable, as long as the screen isn't too cluttered.' (Teacher A)
- **Font colour**: teachers consistently recommend black for white or light backgrounds. White is suitable for use on dark or colourful backgrounds. Green is discouraged, as it tends to be unclear on screens. Red is widely used and preferred to highlight keywords or important information. Students are already accustomed to associating red with key content:

'Red makes important content stand out and grabs attention.' (Teacher A)

'We use red for the main points… It's like underlining with a pen.' (Teacher E)

'Red is already the most visible.' (Teacher F)

7.3.2.2 Specific comments on PROTOTYPE 1

1. Graphics and movement speed

Since the teaching content is related to vocabulary about seasons, the retention of seasonal features elements in scenes and motion effects is acceptable. The main revision (Figure 84) lies in the adjustment of the specific shape of the snowflakes (Figure 85). Teacher A believes that the new design makes the snowflakes more detailed and better conveys the impression of the ‘snowing’, and thus holds a positive attitude toward this change. This also highlights a common issue, as mentioned by the interviewed teacher: when creating such motion graphics, even though teachers have clear teaching goals and aim to create appropriate visual settings, it is often difficult to find ideal visual materials in practice.

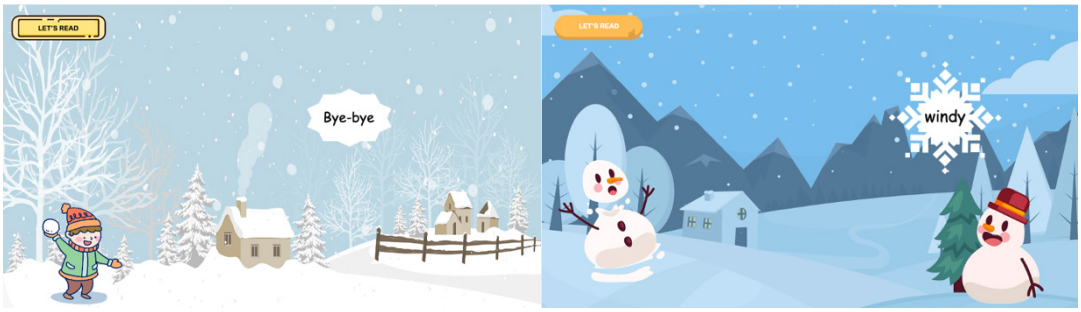


Figure 84: Page in current teaching material (left) and PROTOTYPE 1 (right)



Figure 85: Snowflakes in current teaching material (left) and PROTOTYPE 1 (right)

In addition, Teacher A also mentions the issue of the snowflake's movement speed. Although the PROTOTYPE 1 keeps the same speed as the original, each snowflake takes about three seconds to float across the screen, the teacher still feels that the speed may be too fast for some students. 'If the motion effect goes too fast, students might miss the content they are supposed to read before they even realize it.' (Teacher A) Therefore, the teacher suggests slightly slowing down the animation speed. There is no need to worry about a slower motion effect pace affecting the lesson's progress, since giving students enough time to react and understand is more important.

2. Coherent characters

In the PROTOTYPE 1, the design of the main character (a young girl) undergoes some adjustment (Figure 86). Compared to the current teaching material, where different characters appear in different scenes, using the same character consistently throughout the 'different seasons' scenes add a stronger sense of coherence. This design better aligns with the structure of the teaching script—the teacher guides students to explore the same character's life experiences across different seasons. Therefore, from the perspective of teaching coherence and narrative flow, the teacher prefers using a unified character.

However, using the same character should depend on the specific context, as the teachers mention: 1) if the character appear in the same presentation or classroom session, using a consistent character helps enhance continuity and storytelling, which benefits students' understanding of the content. Teacher D states that when the lesson content contains a storyline, it makes more sense to follow one character throughout; 2) if the content across different presentations or classroom sessions, it is not necessary to insist on character consistency. This is because students may not remember the character from a previous lesson and are unlikely to retain that memory across multiple sessions: 'Within the same presentation, it's better to stay consistent and use one main character, so the children feel a sense of continuity. But if it's across different presentations, that may not be necessary, since students may not remember the person they saw in the last one.' (Teacher A)



Figure 86: Current teaching material (top) and PROTOTYPE 1 (bottom)

3. Local cultural scenarios

In terms of the scenario, the PROTOTYPE 1 features stronger elements of local culture, which is a direction that the teacher consistently emphasises and encourages. Teacher A mentions, 'By doing this, students can more clearly feel the meaning of the word. Actually, the previous design is a bit vague and unclear.' In the current teaching material, some elements make it difficult for students to understand the expressions. For example, when explaining the word 'warm', the current teaching material uses a split image combining a

hotpot meal and a fireplace. Teacher A points out, ‘The slide is a collage, people in the middle are eating hotpot, and there is a fireplace beside them. But for students, they might not understand that this slide is meant to express the idea of “warm”.’ (This is because most students participating in the class live in southern China, where houses typically do not have fireplaces, which may lead to misunderstanding.)

In contrast, the PROTOTYPE 1 replaces the ‘warm’ scenario with a complete ‘dinner’ setting: a family sitting together for a meal, the visuals not only carry more emotional appeal but also align more closely with the students’ real-life experiences. Teacher A comments, ‘This scenario is different…it shows everyone having dinner together, and it is much clearer, with stronger expression.’ The teacher further points out that this kind of design doesn’t just add local cultural elements—it more importantly reflects a real family setting, helping students understand the meaning of the word through familiar life experiences: ‘The previous design doesn’t feel as real. Your current scenario is clearer and better than before, especially in expressing the word “warm”, the change in scenes feels more lifelike.’ (Teacher A) (Figure 87)

Therefore, by choosing scenario that closely reflect students’ daily lives, the PROTOTYPE 1 effectively strengthens the semantic expression of the vocabulary and makes it easier for students to understand and accept. This student-experience-based visual approach receives positive feedback from the teacher.



Figure 87: Current teaching material (top) and PROTOTYPE 1 (bottom)

4. Colour hints and attraction

In the slide about option filler questions (Figure 88), the teachers mainly comment on the change in the colour of the 'season' options. After receiving an explanation, Teacher A supports the PROTOTYPE 1, believing it makes the learning context more straightforward: 'I think the new version (PROTOTYPE 1) is better, because the previous one does may use colour to give a hint, but the new design is clearer and lets students make their own choices. It fits well with how I understand the teaching context.' This shows that the previous design may unintentionally suggest meanings to students through colour, while the new design removes those cues and allows students to make judgments more independently.

From the designer's perspective, it is important to avoid such unconscious colour implications, as colour can carry built-in meanings and influence student choices. However, teachers may not always be aware of these design-related issues, and as a result, they might not notice when students are being misled by visual suggestions.

However, Teacher E values how attractive the design is to students and favours the use of multiple colours in the original version. Teacher E also points out that in the PROTOTYPE 1, the yellow, it is speech bubble becomes more visually dominant than the blue background boxes of the season words, making it harder for students to focus on the key learning content. Therefore, Teacher E believes the current teaching material is more acceptable for teaching purposes.

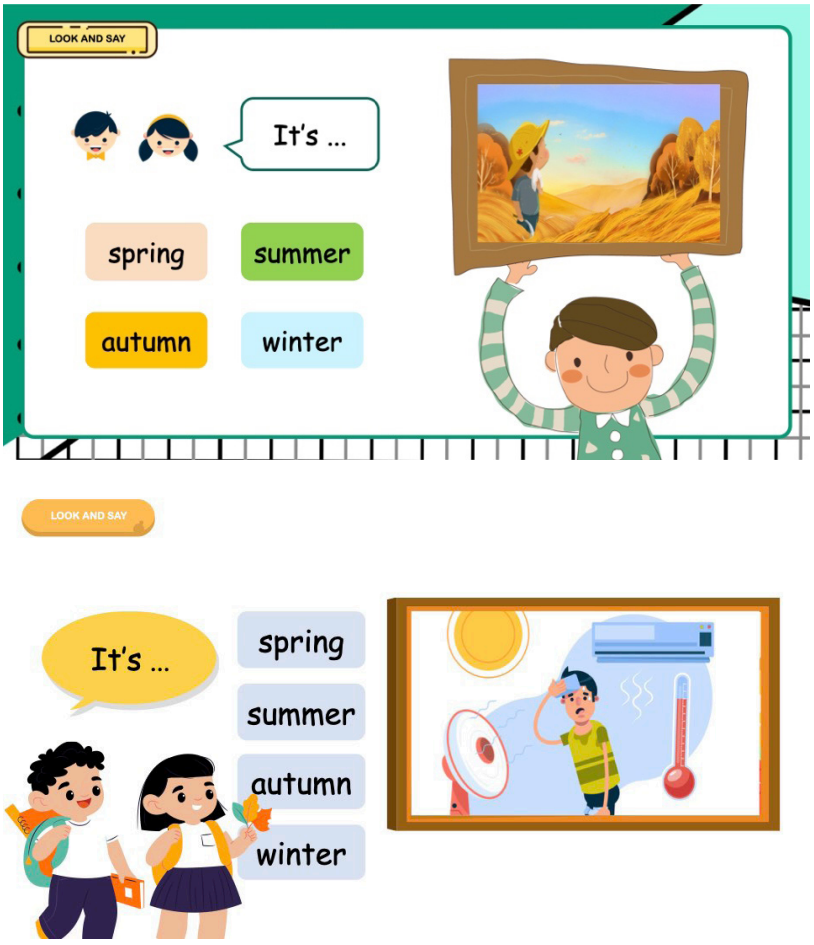


Figure 88: Current teaching material (top) and PROTOTYPE 1 (bottom)

5. Using more types of visual expression

Regarding using different types of visual expressions of the same content (Figure 89) in motion graphics may extend teaching time, teachers believe it is not a major concern. They generally support using more types of expressions to assist student understanding, seeing this approach as helpful in building more comprehensive cognitive frameworks. However, the effectiveness of using visual expressions depends not only on quantity but also on how they are arranged during the lesson.

Teachers point out that visual expressions should be arranged and timed appropriately according to the teaching flow. For example, during the practice sessions, students already have some understanding of the new content and can respond and process information more quickly. At this time, introducing more practice-related visual expressions actually helps deepen understanding and does not significantly extend class time. In contrast, during the teaching of new content, students are exposed to unfamiliar material and need more time to process visual information. If too many different visual expressions appear at this point, or if the scenarios are too complex, it may disrupt the teaching pace and slow down overall progress. Therefore, in instructional design, teachers adjust the number of visual expressions flexibly according to the stage of the lesson and the students' comprehension level. When necessary, they reduce the number of visual expressions to maintain classroom fluency. Designers, on the other hand, can provide multiple visual expressions options and allow teachers to choose what fits best.

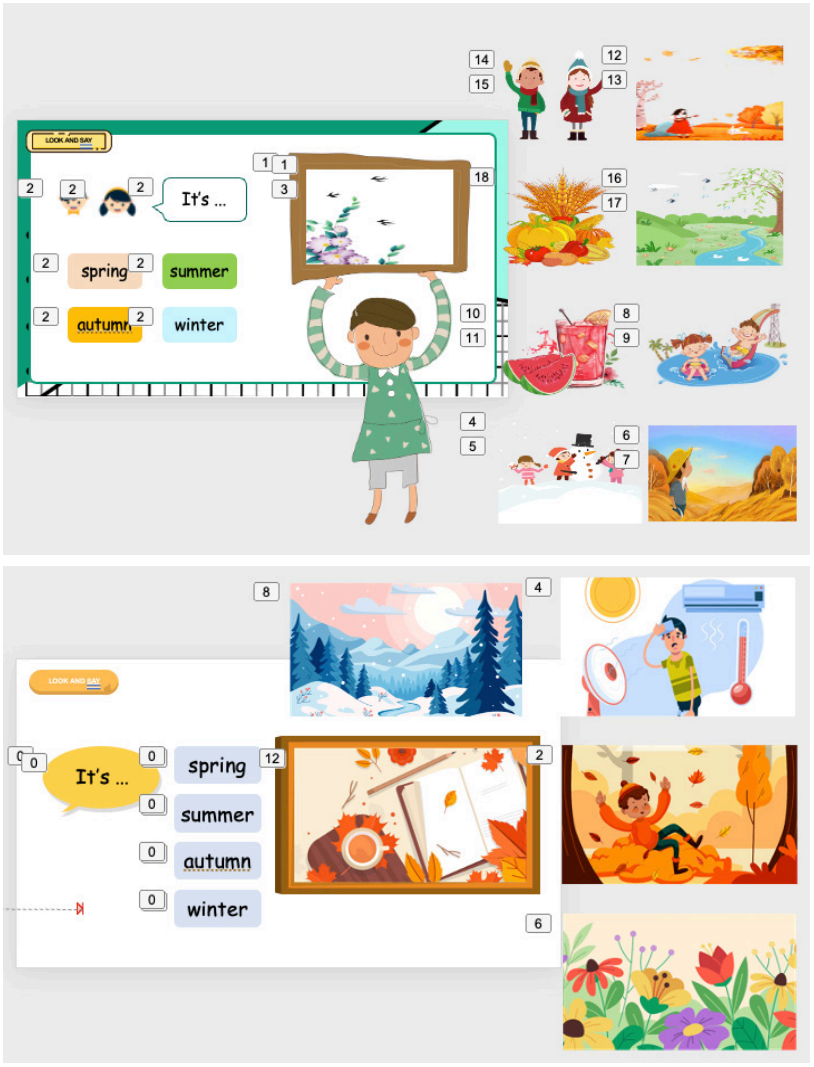


Figure 89: Multi-visual expression in current teaching material (top) and PROTOTYPE 1 (bottom)

6. Motion effect trigger control design

Regarding the motion effect trigger control design of ‘automatic appearance’ versus ‘click-to-appear’ in motion graphics, Teacher A makes a clear distinction and expresses specific preferences. These are mainly based on maintaining the smooth flow of teaching and ensuring flexibility in interaction control.

Teacher A points out that on some slides, when the teaching focus is on allowing students to make their own choices or judgments, such as selecting the correct word, non-essential motion effects should appear automatically. This helps reduce unnecessary steps and prevents confusion for teachers who may be unsure about how many clicks are needed. ‘For example, on this slide, the key is to let students choose the word themselves. The previous motion effects can appear automatically’ (Teacher A)

The teacher emphasises that **clicks** should be reserved for content with guiding or interactive significance: ‘Clicking should be used on important content.’ (Teacher A) This means the use of automatic or click-triggered motion effects should be determined by instructional function, not arranged arbitrarily.

From the perspective of teaching flow, teachers believe that when dialogue boxes for student characters or avatars appear automatically after the slide changes, it makes the classroom experience feel more natural and smoother (Figure 90). It avoids interruptions where the teacher must stop mid-explanation to trigger the motion effect manually: ‘When the students’ dialogue boxes appear, their reactions feel more natural. There’s no need to pause and wait... My personal habit is to let it appear automatically before I explain, and then click to show the students’ response.’ (Teacher A)

Overall, teachers commonly support the following design:

- Automatic appearance works best for process-based motion effects, such as background information, slide transitions, character entries, or non-essential dialogue.
- Click-to-appear should be reserved for key teaching moments, such as when students need to answer questions, or when the teacher leads discussion or explanation, to enhance interaction.

Teachers feel that this motion effect trigger control design better aligns with teaching flow and simplifies operations, improving the overall lesson experience and efficiency.

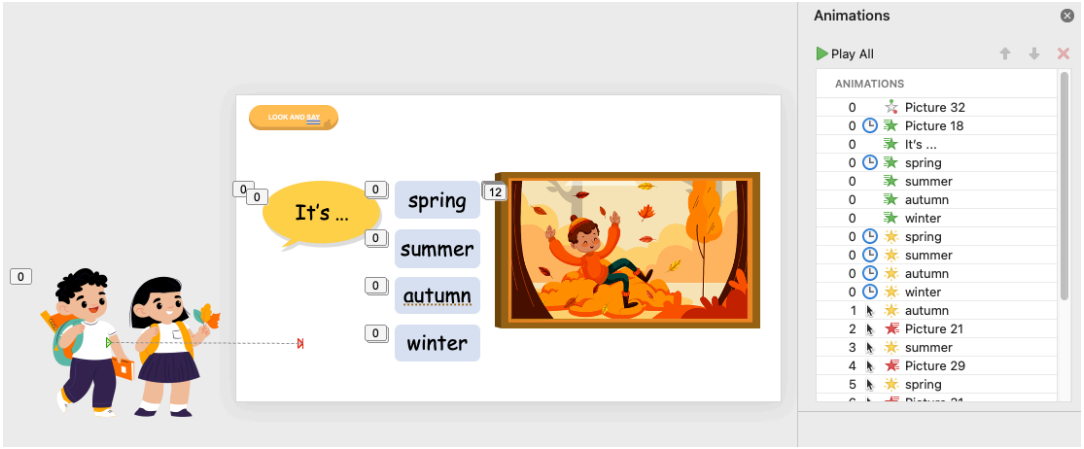


Figure 90: Motion effect trigger control in PROTOTYPE 1

7. Formats of interactive exercises

In the practice section of the teaching material, four different formats of interactive exercises are used to help students recognise ‘season’-related vocabulary (Figure 91). Teachers believe this design is helpful, as it reflects a diversity of content presentation and helps students understand word meanings from different perspectives.

Teachers point out that varying the formats of practice is necessary, as it effectively prevents students from becoming bored due to repetition and increases classroom engagement and participation. ‘If only one type of activity is used, students easily feel bored.’ (Teacher A) Therefore, designers are encouraged to explore richer interactive formats and pair them with motion effects to enhance the classroom experience and learning outcomes.

However, teachers also note that using two to three different interaction formats in one practice session is a reasonable limit. If there are too many changes in format, it may confuse students, especially younger learners, by increasing their cognitive load and reducing learning effectiveness.

Overall, teachers emphasize the importance of balancing ‘variety’ with ‘pacing control’:

- Moderate variation in format helps capture students’ attention and stimulate interest.
- Too much variation may lead to cognitive overload and weaken instructional coherence.
- When repeating a certain interactive format, designers should add fresh elements to avoid student fatigue.



Figure 91: Interactive formats to recognise ‘autumn’ in PROTOTYPE 1

8. Decorative elements and background

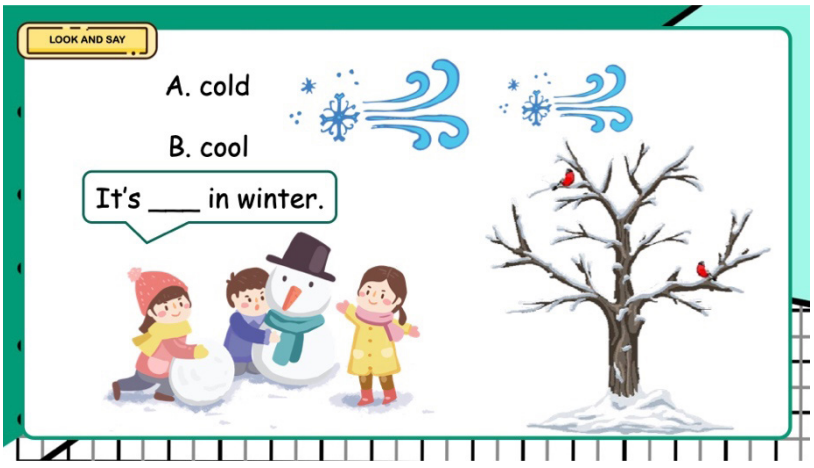
Regarding the use of backgrounds and decorative elements in motion graphics, most teachers are accustomed to using white backgrounds in actual teaching, as they find them easier to adjust and read. However, they also agree that, when used appropriately, decorative elements can enhance visual cues and help distinguish content sections.

Teacher A points out that a well-designed background not only adds aesthetic value but also helps students visually differentiate between different teaching sessions. For example, when switching to a new session or changing the form of an exercise, a background change provides non-verbal cues that add freshness and support the pacing of the lesson.

In practice, teachers suggest using decorative elements flexibly based on the teaching purpose:

1. On a slide with minimal direct instruction and more contextual scenarios, a richer background with more decorative elements can help create an immersive scenario.
2. On pages focused on exercises or questions requiring students to concentrate on reading text, teachers generally prefer reducing decorative elements to avoid distracting students from the task.

For example, Teacher D expresses a preference for the original, simpler design (Figure 92), especially on exercise pages, favouring clean backgrounds to prevent information overload: ‘In the original design, the background behind fill-in-the-blank questions is plain, which makes it clearer… But in the PROTOTYPE 1, I find the screen a bit busy and the content too much.’ Teacher D also offers specific suggestions: ‘Even if backgrounds or decorative elements are used, they can be designed as frames, with a clear space in the middle for questions and answers. For example, placing the questions and options inside a large frame, or having questions on the left and answers on the right… these layouts are clearer.’ It is evident that teachers generally prefer placing decorative elements along the edges of the screen to preserve clarity in the central content area.



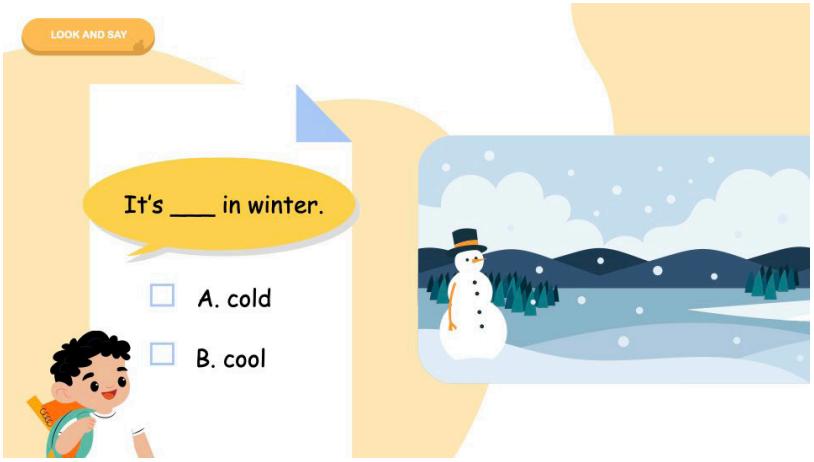


Figure 92: Current teaching material (top) and PROTOTYPE 1 (bottom)

9. The use of cartoon characters

One change between the two versions is the replacement of the character: the current teaching material uses a character from a cartoon, while the PROTOTYPE 1 replaces it with a character of boy (Figure 93). Teachers generally accept this change and even consider it a more appropriate choice.

Teacher A points out that the original cartoon character (Nobita) is not particularly appealing to today's primary school students, since it is not a character, they are currently familiar with or fond of, and the visual style looks slightly outdated. In contrast, a clearly designed and well-drawn ordinary character can be just as attractive to students:

> 'We don't need to use characters they know. As long as the visuals are clear and nice-looking, and they understand what we are teaching, that's good enough.' (Teacher A)
>
> 'Kids nowadays don't especially like Nobita. That's not a popular character for their generation.' (Teacher A)

This shows that teachers care more about whether the content is clear, the visuals are refined, and the teaching goals are achieved, rather than relying on specific cartoon characters to draw attention. Teacher A further suggests that instead of using cartoon characters, it is better to guide students to relate to real-life situations. Letting student understand vocabulary through more realistic scenarios is more helpful in achieving teaching goals: 'It's better to direct their attention to daily life… That may actually work better than using familiar cartoon characters.' (Teacher A)



Figure 93: Current teaching material (top) and PROTOTYPE 1 (bottom)

10. Slides transition effects

Teacher D comments that the slides transition effects can be added to enhance the overall visual coherence and viewing experience: ‘When we design, we add ‘page curl’ effect. You can design this slide with a page curl transition effect between the previous and next slides.’ (Figure 94) This kind of ‘page curl’ transition effect happens to match the ‘book’ pattern shown in the slide. This suggests that the teacher’s recommendation reflects their attention to the coordination between form and content in teaching, and that good visual support can further improve the teaching effect.



Figure 94: ‘Page curl’ effect in PROTOTYPE 1

11. Remove irrelevant characters

Teacher E points out that in the design of one slide (Figure 95), the character image on the side can be removed. Teacher E believes that this character may distract students and lead them to focus on details unrelated to the learning goal, such as ‘What is he doing?’, ‘What kind of clothes is he wearing?’, or even ‘Why does he have so much facial hair?’ These unnecessary points of attention may affect students’ understanding of the core content and reduce their focus.



Figure 95: The slide in PROTOTYPE 1

12. Character hints and visually distinction

In the current teaching material, different characters are used in different sections, which may create contextual ‘hints’. Therefore, in PROTOTYPE 1, different characters are intentionally selected based on the content, hoping to use the characters to reinforce the distinctions between teaching stages (lesson summary with teacher image, post-lesson tasks with student image) (Figure 96)

However, Teacher E points out that although characters can provide hints, their roles must be visually clear: ‘I feel that when both are sitting at a desk, I think they are both students. That girl has a backpack, but it’s still not clear enough.’ This suggests that if character images are used to convey teaching intentions, their roles need to be made visually distinct, through clothing, posture, or placement, otherwise, the cues may become unclear.



Figure 96: Current teaching material (top) and PROTOTYPE 1 (bottom)

13. Simplified motion effects and visual cue

In this lesson activity, students need to do oral expression based on different photos. In the PROTOTYPE 1, each slide first shows a picture, then a student character enters, and finally the dialogue content appears. After reading aloud on that slide, the next slide changes the photo and dialogue, but the overall display order stays the same (Figure 97). Regarding this, Teacher E feels the motion effects are slightly too complicated and suggests reducing them to improve the effectiveness of the lesson.



Figure 97: Visual elements appearing process in PROTOTYPE 1

In addition, Teacher E mentions that, based on the teaching experience, a ‘little finger’ icon (Figure 98) as a visual cue in reading-aloud activities, to guide students to read the text in order: ‘Students today are used to seeing the ‘little finger’ icon and knowing it’s time to read.’ This kind of visual cue has become a clear reading prompt for students. By contrast, in PROTOTYPE 1, only characters and speech bubbles appear, making it hard for students to understand that this activity is meant for reading aloud: ‘If you just pop up some patterns like that, they actually don’t know they are supposed to read it.’ (Teacher E)



Figure 98: The ‘little finger’ icon in current teaching material

14. Correspondence between content and graphics

In one slide of PROTOTYPE 1 (Figure 99), Teacher E believes that when introducing the word ‘snowman’, it is better to show pictures of a snowman, and when introducing the phrase ‘make a snowman’, the picture should then switch to a scene of someone building a snowman. This distinction can highlight the action of ‘make’ more clearly, helping students better understand the meaning of the phrase. The teacher points out that such a visual arrangement allows students to intuitively grasp the action conveyed by the verb ‘make’.



Figure 99: The slide in PROTOTYPE 1

15. Realistic and contextualised scenario

In the slide of interactive activity (Figure 100), Teacher E prefers the design in current teaching material, because it presents a more realistic and contextualised scenario, the socks are scattered on the floor of a room. In contrast, the design in PROTOTYPE 1 places the ‘shoes’ in a blank background, lacking concrete environmental elements. The teacher is concerned that such a presentation may confuse students, making it harder for them to understand the context of the object, and weakening the connection between vocabulary learning and real-life experience.



Figure 100: Current teaching material (top) and PROTOTYPE 1 (bottom)

16. Use of colour tones

Teacher E comments that the colour tone of a set of slides is too dark (Figure: 101), and the blue colour is overly calm, making it less effective in attracting students' attention: 'I think this kind of blue is too heavy, a bit depressing... When the colour is too dull, it doesn't really draw their interest or spark their curiosity.' The teacher emphasizes that the visual impact of colour directly affects students' attention and classroom engagement. Therefore, she suggests that the overall colour scheme should maintain a higher level of brightness to better stimulate students' interest and curiosity.

Regarding colour tone, Teacher D specifically points out that it would be better to maintain a consistent tone and style. However, teacher also mentions that the impact of overall colour tone on student learning outcomes would require long-term observation to assess.

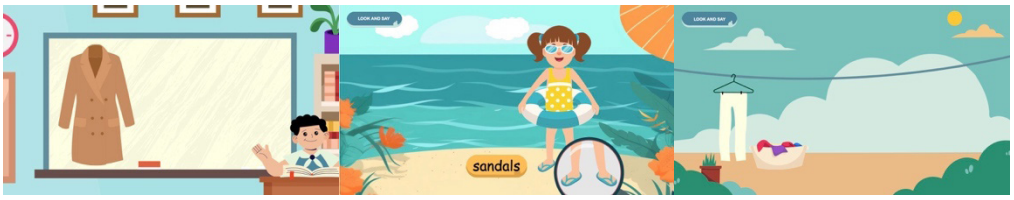


Figure: 101: One set of slides in PROTOTYPE 1

7.3.3 Design insights from REVIEW INTERVIEWS

This set of design insights refines and expands upon the above 6 insights (section 6.3) based on practical feedback from PROTOTYPE 1. The findings are organised to first highlight how existing insights are deepened with specific, actionable rules, followed by entirely new areas of consideration that emerged: (For a detailed description of specific design guidelines corresponding to each 'topic', please refer to the appendix.)

Deepened design insights

1. **From 'aligning with attention' to specific motion parameters (Insight 1 & 2)**
   The general method of matching motion to student attention is now quantified. Teachers specify that for Grade 2 students, motion speed needs to be slowed to give adequate comprehension time: a single motion effect lasting 3–5 seconds is considered a better fit for the information processing pace. (When students need to read words during an animation, the motion speed must be slow enough to ensure sufficient reaction time.)

2. **From 'prioritising clarity' to concrete layout strategies (Insight 2)**
   The abstract goal of reducing cognitive load is translated into specific layout and content rules, particularly for slides teaching new content.
   Backgrounds: it is recommended to use a white background to ensure clarity, but when an immersive scene is needed, more decorative background can be adopted. For practice slides, please place the decorative elements in the edge area to ensure that the central content area is simple and clear.
   Motion Effects: the timing of appearance and disappearance must be controlled to avoid interrupting the teaching rhythm. Effects should be simple and directly tied to conveying content, not just for 'funny'.

3. **From ‘sustaining attention with interaction’ to defined interactive patterns (Insight 1)**
   Detailed interactive activities with specific formats and constraints.
   Variety and quantity: use a variety of practice formats, but limit them to 2–3 types per practice phase to avoid cognitive overload.
   Student preferences: two modes of interaction are identified as highly effective:
   Action-feedback motion effects, where the motion effects respond to a student’s action.
   Voluntary control motion effects, where students are allowed to trigger the effects themselves.

4. **From ‘constructing contexts’ to a multi-layered scenario design (insight 5)**
   Adjusting by teaching phase: use more diverse visual expressions during the practice phase (when students can process faster) and fewer, simpler visuals during the new instruction phase.
   Visual focus: students tend to focus more on the whole scenario rather than on individual characters.
   Cultural relevance: scenarios should specifically include local cultural elements that are familiar to the students’ immediate environment.

5. **From ‘empowering teacher modification’ to understanding teachers’ practical implementation (Insight 6)**
   This provides critical feedback on insight 6. While the goal was to empower teachers, the reality is that their willingness to modify materials remains low due to time constraints, even when instructions are provided. However, clear and concise editing guidelines in the PowerPoint ‘Notes’ section are helpful, confirmed by teachers.

6. **From ‘leveraging consistency’ to specific visual language (Insight 3)**
   Nuanced character uniformity: characters should be uniform within the same lesson to enhance continuity, but consistency is not necessary across different lessons.
   Role differentiation: when characters are used as cues, their roles (e.g., teacher vs. student) must be visually distinct through clothing, posture, or other clear design choices.

7. **From ‘text readability’ to a precise guide (Insight 2)**
   text size: dialogue text should be 32pt, with a minimum of 28pt. Prompts can be smaller (e.g., 24pt) if clarity is maintained.
   Text colour: use black on light backgrounds and white on dark backgrounds. Red is the preferred and expected colour for highlighting key information.

8. **From ‘colour for appeal’ to colour for cognition (Insight 2)**
   Designers must be aware that colours can carry unintentional cues that might mislead a student’s choice, especially when independent thinking is required.
   Colour and contrast directly impact visual hierarchy; non-essential elements should not be more visually dominant than key learning content.

New design insights

These insights introduce design considerations for areas not covered in the above 6 insights.

Supplementary topic 1: motion effects trigger controls
This is a new insight focused on interaction mechanics, addressing a key operational need for teachers. It proposes a clear, function-based strategy for motion effects control:

> Use automatic appearance for procedural content (e.g., character entrances, transitions) to ensure a smooth flow.
> Reserve click-triggered effects for critical instructional moments where teacher control or student response is required (e.g., revealing an answer).

Supplementary topic 2: slide transition effects
This new insight extends the principle of consistency beyond the content of a single slide to the flow between them. Slide transition effects should be added to enhance visual coherence. Ideally, the style of the transition should align with the visual theme of the content (e.g., a “page curl” effect for a book-themed slide).

7.4 PROTOTYPE 2: modification of the PROTOTYPE 1 based on the REVIEW INTERVIEWS

The following examples show the major modifications made to PROTOTYPE 1 based on comments from the REVIEW INTERVIEWS, which subsequently informed the creation of PROTOTYPE 2:

Topic 1: Motion graphics design, lesson flow and attention

Design guideline (in topic):

(3) Visual accuracy and support interactive activities, maintain voluntary attention:

- A duration of motion effects, 3–5 seconds duration better fits lower-grade students' information processing pace

Practical design application:

In the PROTOTYPE 2:
The speed of the 'snowflake-falling' motion effect (3 seconds) in Lesson 1 compared to the 'bubbles' motion effect speed (2 seconds) in Lesson 3. Continuous automatic display trigger of motion effects.
Compared to PROTOTYPE 1, in Lesson 2, the 'leaf-falling' motion effect duration is changed into 4 seconds. The each 'leaf-falling' motion effect are triggered by the teacher

Testing set up:

To form a comparison in the knowledge review section, testing whether motion effects should play continuously or be teacher-controlled, as well as comparing students' response time and the duration of the motion effects (2, 3 or 4 seconds).

Design guideline (in topic):

(4) Reducing florid expressions for new content instruction:

- Place decorative elements around the slide edges to ensure the central content area remains easy to read.

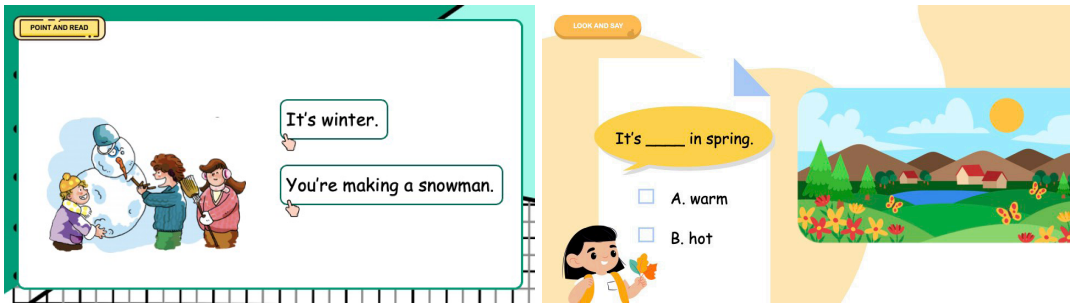
Practical design application:

In Prototype 2, use decorative visual elements that are not placed on the edge of the slide.

Testing set up:

Contrasting tests to see if decorative visual elements have a negative reading impact on important content elements in the center of the slide when they are not placed at the edges.

Current teaching material vs PROTOTYPE 1:



Design guideline (in topic):

(5) Support interactive activities, enhance voluntary attention:
- Action-feedback motion effects.

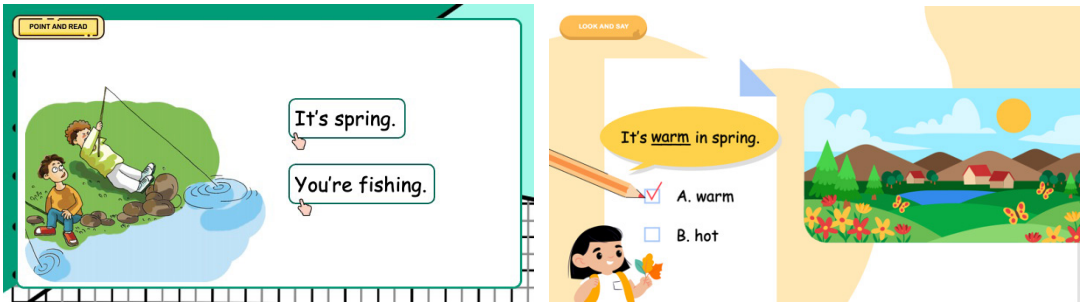
Practical design application:

In Prototype 2, the word choice in the current teaching material is changed to have students hold up their pens to the screen and make 'checking' actions, while a pencil appears on the screen to check off the chosen answer.

Testing set up:

To test comparatively whether interactions in which visual feedback appears on the screen because of student behaviour will receive more student preference than general question-and-answer interactions.

Current teaching material vs PROTOTYPE 1:



Topic 2: Motion graphics and situated learning in the classroom

Design guideline (in topic):

Consistency between content and visuals

Practical design application:

In Prototype 2, add graphics corresponding to the words, so that the word 'snowman' corresponds to a separate 'snowman' graphic, and the action of 'making a snowman' is matched with the scenario graphic of 'children making snowmen'.

PROTOTYPE 1 (up) vs PROTOTYPE 2 (down):



Topic 5: Visual cues and visual consistency

Design guideline (in topic):

When characters serve as cues and convey instructional intent, their roles must be visually recognisable

Practical design application:

In Prototype 2, the difference between the two images is highlighted by zooming in on the character and removing similar features (sitting at the same table).

PROTOTYPE 1 (top row) vs PROTOTYPE 2 (bottom row):





Topic 9: Colour

Design guideline (in topic):

Avoid visual colour cues that may suggest a ‘correct’ or ‘preferred’ choice.

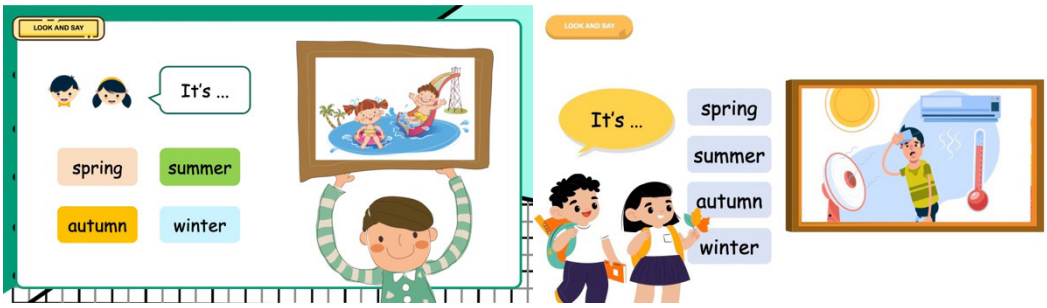
Practical design application:

In the prototype 1, adjust the decorative elements for word options to have no specific colour cues.

Testing set up:

To test whether reducing potential colour cues is supported by teachers and whether this design adjustment promotes students’ independent thinking and reduces unintentional bias.

Current teaching material vs PROTOTYPE 1:



7.5 Iterative contrast tests and interviews

According to the iterative process in EDR, the motion graphics prototype is gradually optimised in terms of instructional relevance and effectiveness through two rounds of contrast testing (FEEDBACK INTERVIEWS 1 and 2), which serve to improve the design guidelines.

Feedback is collected by semi-structured in-depth interviews. The main objectives of FEEDBACK INTERVIEWS are:

1. **Teachers' feedback**
   Teachers are the main operators of motion graphics in classroom, and motion graphics is one of their tools to assist teaching, mainly through the teacher's presentation to achieve the teaching objectives. Therefore, the design of motion graphics must be able to effectively support teachers' teaching activities. In other words, the teacher's teaching style and the use of motion graphics can directly affect the design of motion graphics. In the contrast testing, teachers are further optimised by using the old and new designs separately in a real classroom and providing feedback on their use, thus bringing the potential design guidelines closer to the actual teaching contexts.

2. **Understanding students' reactions to the prototype through teachers**
   Through the teachers' observation, differences in students' classroom responses, such as learning engagement, attention levels, and acceptance of Prototype 1, have been identified. These reactions reflect whether the new design has a positive impact on learning and provide a basis for revising and refining subsequent design guidelines.

3. **Understanding differences in student learning outcomes through teachers**
   Teachers assess differences in students' learning outcomes through classroom observations. By comparing students' responses in the two classes, teachers can evaluate the impact of Prototype 1 in contrast to the current teaching material. This helps determine whether Prototype 1, based on the initial design guidelines, contributes more effectively to improved student learning outcomes.

4. **Further suggestions from teachers**
   Teachers' direct suggestions after using Prototype 1 are key to refining the design guidelines. As primary users of motion graphics in teaching, any inconvenience they experience during implementation leads to concrete evaluations. Since they are already aware of the design changes in Prototype 1 from the prior review interview, their real classroom use allows them to judge whether these changes require further adjustment or have achieved positive effects. These insights contribute to revising the design guidelines.

The feedback collection interviews are also conducted in Cantonese. Anonymous in the same manner, using pseudonym (e.g., Teacher A). The interviews are also conducted in a mixed format, either online or in person, depending on the teachers' availability.

FEEDBACK INTERVIEWS process design

Free expression

At the beginning of the review interviews, teachers are invited to freely share their thoughts and overall impressions after using Prototype 1. This open-ended phase is designed to gather teachers' most direct usage feedback and capture their authentic experiences and personal evaluations.

To support teachers in reflecting on their experiences, the interviewer provides open-ended reference questions, including but not limited to:

> 'Could you share your overall teaching experience after using the new courseware?'
> 'Overall, do you feel that the new courseware is more helpful than the old one during your teaching? Please share your thoughts.'
> 'Which version of the courseware better matches your teaching pace or style?'
> 'Do you have any other thoughts, suggestions, or feelings you would like to share with us?'

During the interview, teachers may express their opinions freely regarding content, structure, visual style, and interactivity. The interviewer mainly plays the role of a listener and only provides light guidance when necessary to encourage deeper reflection.

Discussion

The in-depth interviews are guided by the specific design changes introduced in the prototype. The goal is to gather teachers' authentic feedback and professional judgments regarding the differences between the old and new versions of the motion graphics. During the interviews, the interviewer present selected pages from both versions to demonstrate the design modifications. Teachers are then invited to evaluate the effectiveness of these changes from both teaching and learning perspectives.

The discussion is structured around two dimensions, agreement/positive feedback and doubt/negative feedback, of the design changes.

Agreement/positive feedback

In this section, teachers are asked questions such as:

- Do these changes help facilitate your teaching activities?
- From a student's perspective, how do they respond to the new version? Has learning performance improved?
- Compared to the previous version, what do you think are the reasons behind these positive effects?

Doubt/negative feedback

- This section focuses on possible obstacles or inefficiencies caused by the design changes, such as:
- Do any of the new designs create difficulties or confusion in teaching?
- How do students react to these changes? Are there signs of misunderstanding or reduced learning performance?
- Compared with the old version, what do you believe causes these negative outcomes?

When teachers raise concerns or express negative evaluations of a specific design change, the interviewer explains the original design rationale. This leads to a reflective dialogue, in which teachers are invited to assess the reasonableness of the design intention based on their real teaching experiences and offer improvement suggestions. Example questions include:

‘Do you think the design intention is reasonable from a practical teaching standpoint?’
‘Based on your classroom reality, do you have any suggestions or needs for further revision?’

Through this discussion, the researcher aims to collect in-depth feedback on motion graphics optimisation, including both practical impressions and professional insights. These insights serve as empirical foundations for the next iteration of the prototype and design guidelines.

Free expression on student responses
This section focuses on ‘student responses observation’, which invites teachers to freely share their reflections and judgments on students’ reactions and learning outcomes based on their own teaching experiences. The goal is to enable unstructured, open communication that captures authentic, in-the-moment perceptions and individualised insights from the classroom.

Teachers’ responses generally address two key aspects:

- Immediate reactions in class
  This includes students’ acceptance and engagement with the PROTOTYPE 1 in terms of visual presentation, interaction design, and content organization. Teachers may observe changes such as increased attention, greater willingness to participate, or heightened interest in the content.
- Comparison of learning outcomes
  Based on classroom observation, teachers may compare how students perform in terms of comprehension and knowledge acquisition when using the new versus the old teaching material. Differences in learning effectiveness are emphasized.

Sample open-ended questions include:

‘While using the new and old versions of the courseware, what different reactions or changes did you observe among students?’
‘In terms of student feedback and learning effectiveness, what differences did you notice between the two versions?’

7.5.1 FEEDBACK INTERVIEWS 1: collection and results

In the first iteration, Prototype 1 is based on Unit 6 from the second semester of Grade 2. This unit includes six lessons. Participating teachers conduct a comparative teaching testing in two parallel classes, using the current teaching material in one and Prototype 1 in the other. The focus is on assessing the impact of the prototype's design on the teaching process and student learning outcomes. After completing all lessons, teachers participate in the first round of feedback interviews (FEEDBACK INTERVIEWS 1) to discuss the strengths, weaknesses, and overall student response during the implementation of Prototype 1.

7.5.1.1 Profile of participants

There are 3 participants in total, they all participated in the review interviews. The following table (Table 4) provides an overview of the direct participants and their corresponding indirect participants of the feedback collection:

Date of interview	Direct participant	Format of the interview	Duration of interview	Indirect number of participants	Teaching across subjects	As class supervisor
21 August 2024	Teacher E	Online	01:13:07	42 (prototype 2) 44 (current material)	No	No
5 August 2024	Teacher A	Online	01:29:22	42 (prototype 2) 43 (current material)	No	No
5 August 2024	Teacher F	Online	01:22:25	41 (prototype 2) 45 (current material)	Yes	No

Table 4: Overview of the participants

7.5.1.2 Results of the FEEDBACK INTERVIEWS 1

Specific feedback on PROTOTYPE 2

1. Colour usage and feedback

The intensity of colour directly affects students' visual comfort. All interviewed teachers point out that overly strong colour contrasts should be avoided: 'Students sitting in the front row find images with high colour intensity rather glaring and are resistant to large areas of red' (Teacher A); 'Some fluorescent

colours also appear glaring to students' (Teacher E). When students dislike the colours used in the visuals, they often lose interest in watching the motion graphics.

Students exhibit different emotional responses to different colours. The use of colour can aid students in understanding the visual content. Teachers find that, in versions of motion graphics with varying colour tones, students generally dislike greenish tones, as they are similar to the slightly green colour of blackboards commonly found in Chinese classrooms (Figure 102).



Figure 102: Green colour of blackboards Chinese classrooms and PROTOTYPE 2

This suggests that the colour tone of motion graphics should consider the real teaching environment, especially the background colour surrounding the screen, to avoid excessive similarity in colour, which may cause visual distraction. In addition, students show a stronger preference for cool tones, particularly blue (Teacher A) (Figure 103).



Figure 103: Students' preference for cool tones in PROTOTYPE 2

Overall, colour, imagery, and dynamic effects jointly influence students' attention. The colour design of motion graphics not only relates to visual experience but also directly impacts students' learning interest, attention span, and comprehension of knowledge.

Teachers also point out that students' interest primarily lies in the teaching content and classroom interaction, with relatively little focus on colour. Although colour tone may influence the classroom atmosphere, teachers themselves are less aware of this effect, and the specific impact of colour on learning outcomes is difficult to determine. Furthermore, while teachers do make modifications when using teaching materials, they usually do not adjust the colours. This is particularly true for materials sourced from the internet, as most teachers lack the technical skills and time to optimise colours.

2. Fonts, layout, and visual cues

Teachers reiterate that clear expression is the primary principle in motion graphics design. In terms of font design, although the standardised use of font size and type enhances overall aesthetics, teachers focus more on visual clarity and the directness of information delivery. In terms of stylistic preferences, teachers more commonly adopt a layout style featuring a white background with moderate decorative elements. This not only aligns with existing teaching materials but also offers good visual recognisability, helping students quickly identify and understand the content (Figure 104).

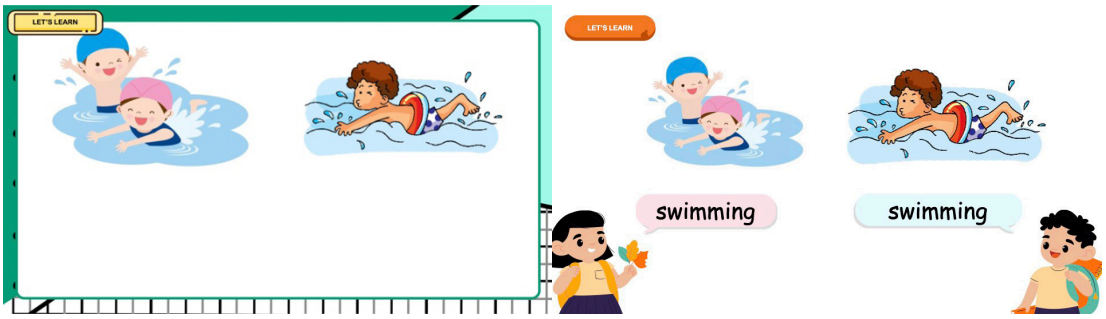


Figure 104: Example of white background with moderate decorative elements

Effective layout supports clear visual segmentation and optimises the sequence of information presentation, preventing students from experiencing confusion when viewing images and text. For example, if the image-text arrangement is not well structured, ‘students may first look at the image and then read the text, or misread from top to bottom, affecting the accuracy of information reception.’ (Teacher A). Teachers note that students need to stay focused to learn effectively, and visual disorder may reduce their classroom engagement.

In classroom interaction, the design of visual cues is also considered a key means of enhancing comprehension efficiency. For example, during role-play reading activities, using different coloured ‘speech bubbles’ to distinguish characters helps students quickly identify their parts for reading. In contrast, older versions of courseware lacking such cues are more likely to lead to confusion during reading (Teacher A) (Figure 105).



Figure 105: ‘Speech bubbles’ in current teaching material (left) and PROROTYPE 2 (right)

Furthermore, the guidance of visual focus also plays a positive role in student cognition. Teachers observe that when a particular element in the motion graphics has dynamic features (such as a character's hair being blown), students are more easily drawn to it and quickly grasp the meaning of keywords (such as 'cool'). This indicates that appropriate visual design not only enhances students' attention but also aids in the perception and understanding of word meanings (Figure 106).

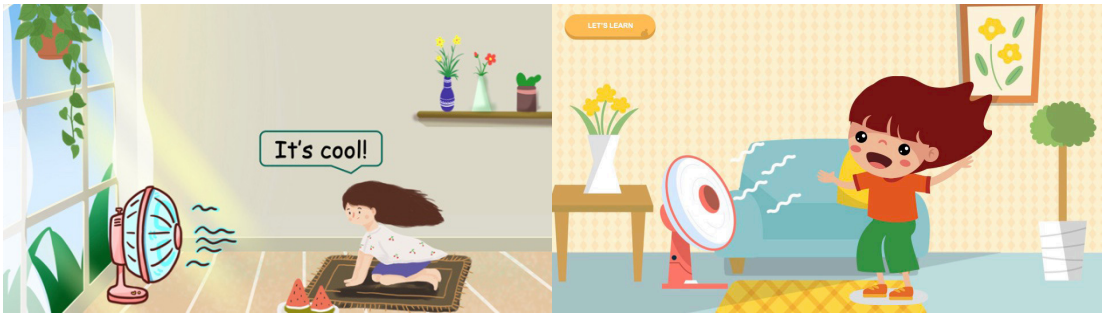


Figure 106: Current teaching material (left) and PROTOTYPE 1 (right)

3. Use of graphics and decorative elements

Interviewed teachers generally believe that graphic design should have a clear focus in order to avoid causing unnecessary confusion or debate among students. For example, in a teaching scenario involving the categorisation of clothing, if the imagery is not sufficiently clear, students may disagree on the classification criteria due to clothes being suitable for multiple seasons, which can disrupt the flow of the lesson (Figure 107).

The choice of graphics and photos should depend on the specific teaching content. Teacher F points out that for more abstract or cognitively demanding content, cartoon-style graphics may increase students' cognitive load. In such cases, using real-life photos can more effectively enhance students' understanding.



Figure 107: 'Spring and autumn' are classified in the same 'basket'

The function and importance of graphics also vary across different stages of teaching. In the case of a read-aloud activity, for example, Teacher A believes that the primary focus is on guiding students to imitate and read sentences aloud, making the role of graphic relatively minor. In contrast, during stages where it is important to establish a learning context, photos and graphics play a crucial role by enhancing students' sense of immersion and interest, thereby supporting the achievement of teaching objectives.

In prototype 1 (Figure 108), teachers observe that although the instructional goal is to direct students' attention to the dialogue content (text), the cartoon character 'Peppa' is highly engaging. As a result, most students focus on the character's appearance and overlook the textual information, which affects the delivery of the lesson's main objective.



Figure 108: 'Peppa pig', the cartoon character in PROTOTYPE 2

4. Image size, composition, and information delivery

Teachers believe that the images and patterns used in teaching must have sufficient clarity and appropriate size to ensure that students can accurately identify and understand the information presented. If images are too small or blurry, students may struggle to extract information, which in turn affects the overall effectiveness of the lesson.

Compared with existing teaching materials, the images in prototype 1 are of higher quality and better clarity, showing a positive effect in enhancing students' learning interest and capturing their attention. Teacher A suggests that key image elements could be enlarged or highlighted through colour-enhanced design to increase their visual prominence. This approach can effectively guide students' attention, improve visual direction, and enhance classroom focus.

5. Presentation order and pacing control

Teachers note that when a large amount of information appears on the screen simultaneously, students, especially those in lower grades, struggle to process it effectively. In response, Teacher A suggests a 'step-by-step presentation' approach: 'If it is shown part by part, their attention will be focused on that part... It will be smoother. With gradual presentation, students are less likely to get confused.' Teacher A highlights that in a lesson about 'shoe categorisation', presenting all content at once makes it difficult for students to identify key details. Students sitting at the back in particular may not see clearly, and due to the high information density, they can easily lose their place during read-aloud tasks, leading to distraction and reduced understanding and task performance. By contrast, PROTOTYPE 1 adopts a progressive presentation method, which not only improves the overall classroom flow but also helps students focus on the current task. This in turn enhances teaching efficiency.

6. Teachers' needs for game and interaction design

Teachers generally prefer to incorporate competitions into their lessons to stimulate student interest. They favour using spinning wheel games as a form of classroom activity (Figure 109). Effective game design should not only be engaging but should also encourage student language output, thereby enhancing their speaking ability. A fast game pace is considered beneficial for boosting student participation. However, teachers also emphasise the importance of controlling the frequency of game use. If similar types of games are used too frequently, students may experience aesthetic fatigue, leading to a loss of novelty and a decline in engagement, which in turn can affect the overall effectiveness of teaching.

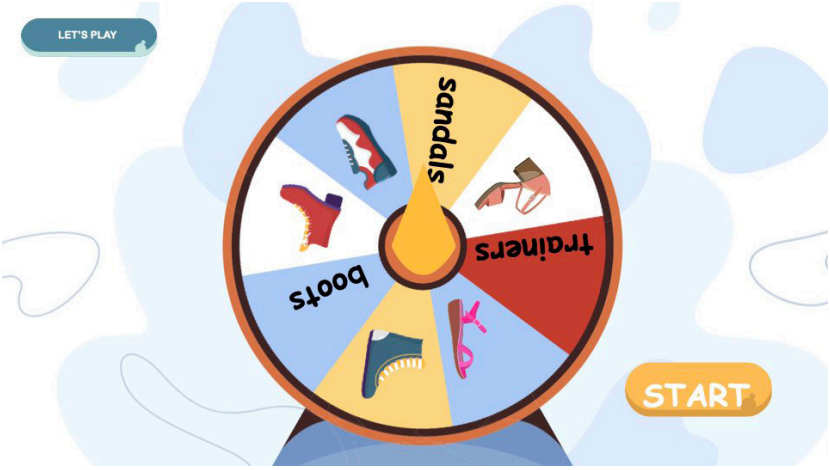


Figure 109: Spinning wheel game in PROTOTYPE 2

When comparing the two versions of motion graphics, teachers point out that the current material lacks sufficient interactivity. In contrast, PROTOTYPE 2 includes richer interactive design elements. In particular, the integration of game mechanisms in PROTOTYPE 2 enhances the overall classroom experience, making it more engaging and encouraging more active student participation.

7. The role of sound effects and audio in attention regulation

Teacher A points out that when students hear the cartoon characters speaking, they are likely to feel as if 'the characters in the story are speaking directly to them,' which enhances the sense of realism and appeal in the lesson. This sense of presence created by sound helps students engage more deeply in the learning context.

From a pedagogical perspective, the addition of audio effectively enriches teaching methods, breaking away from the traditional model centred on the teacher's narration alone. Students can directly obtain linguistic information from the voices of characters in the motion graphics. Especially in the learning of pronunciation and intonation, audio provides vital support for teaching pronunciation and helps improve the quality of students' language input. However, teachers also emphasise the issue of controllability in the use of audio. In particular, during text reading activities, if the audio cannot be paused or controlled, it may disrupt the teacher's management of the classroom pace and even affect the achievement of learning objectives.

Therefore, teachers suggest a clear distinction in instructional design between situational sound effects and content reading functions, and stress that audio playback should have the necessary operational flexibility to support the overall teaching process rather than cause disruption.

8. Visual appeal and highlighting strategies

Regarding students' aesthetic preferences, Teacher A asked the students who had used prototype 1 for their opinions. They generally preferred the new motion graphics design, considering it more visually appealing compared to the teaching materials they had used previously. They found the colours more vivid, the visuals more attractive, and the overall style better aligned with their aesthetic tastes. Teacher A noted that when patterns are small and colours are dark, students often need more time to recognise and understand the information, which slows down the teaching pace. Teacher A further pointed out that when using the current material for scenario presentation, teachers must spend more time explaining to students, whereas with PROTOTYPE 1, students understand the image content more quickly. This reflects that design optimisations in visual contextualisation and information delivery effectively reduce cognitive load.

Teachers provided specific suggestions on visual hierarchy guidance. Teacher A recommended emphasising key information by using a white background, as seen in the current material design. This high-contrast approach not only aids visual focus but also enhances students' ability to identify crucial information. The use of colour and background contrast is considered an effective method to improve the clarity of teaching content.

9. Contextual relevance and alignment with students' real-life experiences

Scenario designs that are specific and relevant to students' lives tend to spark greater curiosity and interest, encouraging more active cognitive engagement and improving comprehension.

Teacher A particularly states the importance of considering local cultural backgrounds and students' lived experiences in design, as expressions that do not align with students' cognitive habits can increase the difficulty of understanding. For example, teacher A states:

> 'Our students are from Guangzhou. When they see certain images, it may take them a while to recognise that it's autumn, because our autumn doesn't have red maple leaves. So, it's hard for them to use words like 'cool' to describe the season.'
>
> 'In our region, autumn definitely doesn't look like that.'
>
> 'Students from other regions might find it easier to understand, but for us, it's not just a matter of curriculum adaptation; it's about whether the scenario connect with students' experiences.'

Therefore, teachers believe that while emphasising the clarity of key content, design should consider the students' local contexts to enhance both the relatability and comprehensibility of teaching materials.

10. Lesson plan usage

In teaching practice, the challenges of integrating lesson plans with instructional materials directly affect the frequency of material usage by teachers. On one hand, teachers think that lesson plans are often complex and overly theoretical, making them difficult to translate into practical classroom applications. On the other hand, some teachers report that effectively incorporating lesson plan content into PowerPoint presentations can help reduce repetitive operations and improve teaching efficiency.

7.5.1.3 Design insight of FEEDBACK INTERVIEWS 1

This set of design insights is based on practical feedback from PROTOTYPE 2: (for a detailed description of specific design guidelines corresponding to each 'topic', please refer to the appendix.)

Deepened design insights

1. **From 'appeal' to 'visual comfort' in colour usage (Insight 2)**
   The primary goal of colour design shifts from simply attracting attention to ensuring visual comfort and reducing cognitive load. Actively avoid visually harsh colours, including high-saturation contrasts, large areas of bright red, and fluorescent tones that can be glaring and cause discomfort for students.
2. **A new functional requirement for audio: controllability (Insight 1)**
   Audio elements must include specific technical features to support the overall lesson flow and attention management: all instructional audio, especially for read-aloud activities, must be controllable by the teacher (e.g., include a pause function) to prevent it from disrupting the lesson pace.
3. **A concrete strategy for information pacing: step-by-step presentation (Insight 1 & 2)**
   The abstract principle of managing attention and reducing cognitive load is translated into a specific, actionable presentation technique: when presenting dense information, use a 'step-by-step presentation' approach to reveal content sequentially. This guides student focus and prevents the cognitive overload that occurs when all information appears at once.

New design insights

1. **Coordination of the physics teaching environment**
   Design choices within the digital interface must consider the external, physical classroom environment to prevent visual interference and fatigue: avoid colour schemes that are overly similar to dominant colours in the classroom, such as the greenish tint of a traditional blackboard, as this can reduce visual clarity.
2. **Geographic and cultural adaptability in scenarios (evolves from Insight 5)**

Scenarios should reflect the local cultural, geographical, and climatic realities of the students. Generic or mismatched representations (e.g., autumn maple leaves for students in a tropical climate) must be avoided as they create cognitive dissonance.

3. **A practical solution for teacher modification tools (new solution for Insight 6)**
   Instead of separate lesson plans, embed all modification instructions and teaching tips directly into the 'notes' section of the PowerPoint slides. This aligns with teachers' existing habits and dramatically lowers the barrier to use.

7.5.2 PROTOTYPE 3: modification based on the FEEDBACK INTERVIEWS 1

According to the school's teaching plan, the content used in PROTOTYPE 3 is taken from Unit 5 in the first semester of Grade 2.

Topic 1: Motion graphics design, lesson flow and attention

Design guideline (in topic):
(4) Reducing florid expressions for new content instruction • Contrast between colours in content and the background is an effective strategy for optimizing the visual hierarchy and directing students' attention to important elements.
Practical design application:
In PROTOTYPE 3, different background colours are applied, while ensuring that a high contrast is maintained between the background and the content to create clear information presentation.
Testing set up:
To test whether the use of a white background is indispensable for presenting new lesson content with clarity, or whether achieving sufficient contrast between background and content would serve the same purpose.
Different background colours used in PROTOTYPE 3:



Design guideline (in topic):

(5) Support interactive activities, enhance voluntary attention

- Incorporating competition-based activities into the classroom can effectively boost student engagement and interest.

Practical design application:

In PROTOTYPE 3, a competitive word-guessing game is added to the simple Q&A activity originally included in the current teaching material.

Testing set up:

To test whether competitive, guessing games can enhance student interest more effectively than simple Q&A activities.

Competitive, guessing game in PROTOTYPE 3:



Topic 3: Graphics and photos in visual expression

Design guideline (in topic):

Combination of graphics, photos and text, language input support

- Excessive and frequent use of photos or decorative graphics can diminish the prominence of the textual content as a key pedagogical element.

Practical design application:

In PROTOTYPE 3, the use of decorative elements is reduced.

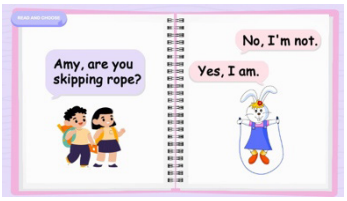
Testing set up:

In the same teaching stage, compared with Prototype 2, Prototype 3 simplifies decorative elements. A further contrast test with the current teaching material that try to find out what extent decorative elements can both enrich the visual presentation and keep students' attention focused on the core instructional content.

Current teaching material vs PROTOTYPE 2 vs PROTOTYPE 3:







Topic 9: Colour

Design guideline (in topic):

- Students tend to prefer 'cool' tones (especially blue).
- Greenish tones are generally less favoured by students because they are too similar to the slight green tint of traditional classroom blackboards.

Practical design application:

In Prototype 3:

1. Two types of blue with different brightness levels are applied.
2. Within the 'cool' colour scheme, two variations are applied: blue bias and purple bias.
3. Yellow–orange colours are applied to create a strong contrast with the surrounding blackboard background.

Testing set up:

1. To conduct a comparative test to identify students' general preferences regarding different brightness levels of colours.
2. To compare students' preferences for 'cool' tones with different colour tendencies (e.g., blue vs. purple).
3. To explore whether a colour that is not a 'cool' tone but has strong contrast with the blackboard background can also achieve better visibility and display effectiveness.

1) Different brightness levels of blue





2) Different colour tendencies within cool tones (blue vs. purple)





3) Use of yellow–orange colours with strong contrast against the surrounding.



7.5.3 FEEDBACK INTERVIEWS 2: collection and results

In the second round of testing, due to the school's semester teaching schedule, the teaching content used in Prototype 2 is Unit 5 from the first semester of Grade 2. A different group of second-grade students participates in this round. Due to adjustments in teaching assignments, some of the participating teachers differ from those in the first round. This round of testing and interviews focuses on the same aspects as Feedback Interviews 1, continuing to collect feedback from teachers and students on the use of Prototype 2 in real classroom settings.

7.5.3.1 Profile of participants

There are 2 participants in total. The following table (Table 5) provides an overview of the direct participants and their corresponding indirect participants of the feedback collection:

Date of interview	Direct participant	Format of the interview	Duration of interview	Indirect number of participants	Teaching across subjects	As class supervisor
17 January 2025	Teacher E	Online	01:34:46	40 (prototype 3) 41 (current material)	No	No
2 March 2025	Teacher A	Online	01:49:28	39 (prototype 3) 41 (current material)	No	No

Table 5: Overview of the participants

7.5.3.2 Results of the FEEDBACK INTERVIEWS 2

General feedback from teachers

1. Attention regulation, visual and sound

Teacher E further notes a growing disinterest in static content due to students' familiarity with animated media, increasing reliance on motion elements to maintain classroom engagement. However, following the implementation of motion graphics in Prototype 3, designed to address attention distribution issues, teachers find that the motion graphics at the end of lessons offer limited benefit. They conclude that visual design should serve the content itself, rather than attempting to grab students' attention at the end of the lesson.

Teacher E points out that the use of colour in Prototype 3 still requires optimisation, particularly to avoid imposing a visual burden on students. The teacher suggests reducing colour saturation and avoiding overly bright or glaring tones such as yellow and red, especially in large visual fields, to ease visual strain. Furthermore, the teacher emphasises that text colour should not be too light, and that sufficient contrast between text and background must be ensured. Overly decorative or vivid text colours should be avoided, as they may compromise the clarity of information delivery. The design should prioritise legibility and information clarity as core principles.

Teachers observe that when videos (including animations and footage) include both audio and visuals, students tend to be more drawn to the visuals than the audio. Teacher E notes that recordings using children's voices are more engaging for students than those using adult voices. A possible explanation is that students find adult voices, particularly those similar to their teachers', too familiar and monotonous, whereas peer-like voices are more novel and appealing to them.

2. Font design and curriculum setting

In most cases, the fonts used in motion graphics differ from those in the textbook. Teacher A finds this problematic, especially for Year 2 pupils who are still learning to write words. The mismatch between motion graphics and textbook fonts may cause confusion when students review the textbook at home. Teacher A suggests that using the same font as the textbook helps establish cognitive links and supports alignment between classroom visuals and printed materials. Both interviewed teachers note that since textbooks are frequently updated, they do not have a fixed preference for fonts, nor do they perceive a clear impact of font choice on student learning.

For the interviewed teachers, the continued use of the 'Bat Font' in Prototype 3 is seen as appropriate. This typeface is visually clear and aids students in recognising and understanding written words. Teacher E highlights its effectiveness in supporting information delivery, while Teacher A notes that students' familiarity with a font directly influences their speed in recognising letters and words. Early exposure to a consistent typeface helps students respond more quickly to new vocabulary, whereas frequent changes may slow their reading due to the need for visual adjustment. Teachers agree that the 'Bat Font' supports handwriting development. Teacher A even suggests that textbooks should adopt the same font to strengthen students' letter

recognition and writing. Teachers agree that font choices should align with the teaching content, particularly with handwriting instruction. Teacher E notes that the relevance of font depends on whether handwriting is being taught, and speculates that textbooks may adopt printed fonts to ensure continuity with secondary-level materials. Teacher A suggests that the designers of the current material may have intentionally chosen the ‘Bat Font’ to resemble students’ handwriting, thereby supporting writing development.

However, teachers commonly express uncertainty regarding the rationale and criteria behind font decisions in teaching materials. The rationale for font changes, including whether these are pedagogically driven or administratively mandated, remains unclear. Given the regional and institutional differences in curriculum, such as whether handwriting is introduced in Grade 2, teachers believe that font use should be context-specific and may not be suitable for standardisation.

3. Interactive design in motion graphics

Teacher E further distinguishes two forms of coordination between motion graphics and game-based activities. The first involves motion graphics directly leading students into interactive games, such as a spinning wheel, where visual feedback is provided in real time to enable human-computer interaction. The second uses motion graphics to explain game rules, supporting teacher-student or peer interaction. In familiar games, simple visual prompts suffice, while unfamiliar games require a clearer demonstration of procedures. Teacher E also emphasises that, beyond entertaining effects, interactive elements should encourage student initiative and practical engagement. Teachers believe that if the interaction aligns closely with learning objectives, experienced educators can effectively manage the pace without it distracting students. As a result, teachers continue to support the interactive enhancements in Prototype 2, viewing them as helpful for increasing motivation and participation.

4. Usage of graphics and photos

Regarding the choice between photos and graphics, Teacher E believes the most important factor is aligning with the context of the teaching content. Current teaching material mainly uses graphics, and sudden switches from graphics to photos within the same lesson may affect student understanding. The choice of photos or graphics depends on the content needs. For example, when the lesson involves field learning after class, using real photos of the location better conveys the information accurately. Additionally, Teacher E

mentions that in lower-grade teaching, using student photos or video materials can enhance classroom intimacy, but portrait rights must be considered, so using photos of people is generally limited.

Specific feedback on PROTOTYPE 3

1. Text colour usage

For non-key text content (such as titles), high-contrast and clear colours can be selected based on the background colour, usually using white or black fonts (Figure 110). Teachers and students are accustomed to using black as the main font colour, occasionally white, and other colours are rarely used. Teachers believe that red is more appropriate for highlighting key content. It works best to mark the key content in red within black text, as students are already accustomed to this colour scheme (Figure 111). The teacher indicated that although other colours can be used, blue and green are usually avoided because ‘they are not clear on electronic screens and students have difficulty recognising them’ (Teacher E).



Figure 110: High-contrast and clear colours



Figure 111: Key content in red within black text

2. Visual segmentation and use of 'boxes/frame'

Regarding clear expression, Teacher E prefers the design in Prototype 3, which uses patterns to 'box' different content, making the page structure clearer (Figure 112). This framed layout helps visually segment content and improves comprehension.

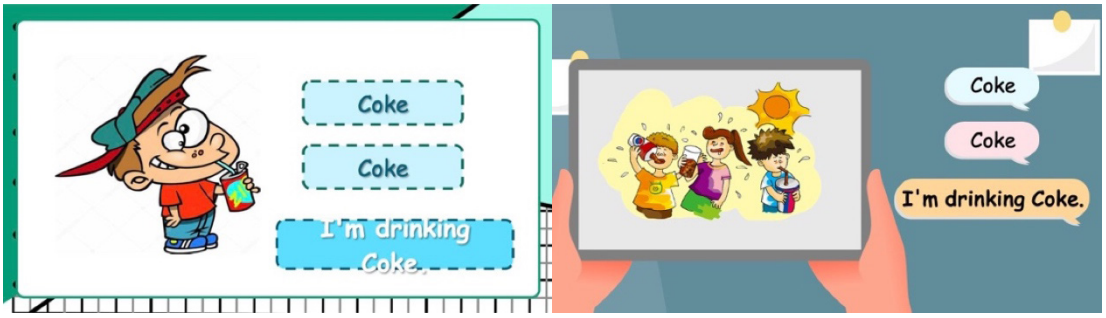


Figure 112: Current teaching material vs PROTOTYPE 3

3. Usage of cartoon characters and motion effects

Regarding the use of cartoon characters in motion graphics, although characters like Peppa Pig remain popular with students (Figure 113), some cartoon characters have become 'outdated' for them due to exposure to diverse media outside class. Therefore, these characters may not effectively engage students and do not meet teachers' expectations. Additionally, as students become more familiar with multimedia teaching, teachers find that static graphics fail to meet their expectations for 'engaging classroom expression', making motion presentations a common demand.



Figure 113: Peppa Pig in PROTOTYPE 3

Teacher E states that motion effects that affect students' attention are mainly character with actions and activities (Figure 114). General motion effects, such as bouncing titles, may attract attention briefly but do not arouse student discussion (Figure 115).



Figure 114: Motion effects in character with actions and activities



Figure 115: Bouncing titles in PROTOTYPE 3

7.5.3.3 Design insight of FEEDBACK INTERVIEWS 2

This set of design insights is based on practical feedback from PROTOTYPE 3: (for a detailed description of specific design guidelines corresponding to each 'topic', please refer to the appendix.)

Deepened design insights

1. **A systematic framework for integrating motion graphics and games (Insight 1)**
   Motion graphics as a direct entry point: using motion effects (e.g., a spinning wheel) to initiate interaction, with real-time visual feedback.
   Motion graphics for game introduction: using graphics to explain game rules, thereby supporting and structuring teacher-student or peer-to-peer interactions.
2. **A comprehensive framework for text design in a pedagogical context (Insight 3 & 2)**
   The complex issue of font selection is consolidated into a multifaceted principle that balances consistency, pedagogy, and practical constraints.
   Cross-media consistency is crucial: the font used in digital materials should be consistent with the printed textbook, especially for grades learning to write, to avoid cognitive confusion.
   Pedagogical alignment: font choice should support pedagogical goals, such as using a font that resembles student handwriting (e.g., 'Bat font') during handwriting instruction stages.
   Acknowledge practical constraints: a single, standardised font is impractical due to frequent textbook updates and regional differences in curriculum (e.g., when handwriting is taught). Design must therefore be context aware.
3. **A refined understanding of audio engagement (Insight 1)**
   Audio recorded with children's voices is more engaging for students than adult voices. The peer-like quality offers a novel and appealing listening experience, whereas adult voices (especially those similar to the teacher's) can feel monotonous.

New design insights

Ethical and legal constraints in visual expression

While using photos or videos of students can enhance classroom intimacy, designers and teachers must be mindful of portrait rights. Due to these privacy and legal concerns, the use of identifiable photos of people should be generally avoided or handled with extreme care.

7.5.4 Summary

The above sections have detailed two rounds of iterative contrast tests and interviews. Analysis of the final round of teacher feedback reveals the repetition of previous insights, with no new themes emerging. This indicates that a state of thematic saturation has been reached, thus marking the conclusion of the iterative data collection phase. The research will now transition into a comprehensive synthesis. In the following chapters, findings from across the research will be integrated to construct the final motion graphics design guidelines.

Chapter 8 | Phase 3 data collection and analysis

8.1 Introduction

Chapter 8 presents the final, critical stages of this research: the development, expert validation, and subsequent refinement of the design guideline. First, the chapter presents the initial set of design guidelines, systematically developed by building on findings from the preceding phases. This set, structured into ‘topics’ (section 6.2.3), formed the basis for evaluation. Secondly, it reports on the VERIFICATION INTERVIEWS with professional designers. The analysis of this focuses on validating the guideline’s clarity, practicality, and applicability. It also serves to assess the novelty of the principles and gather recommendations for their optimal presentation and structure. Finally, the chapter demonstrates how, based on the insights from VERIFICATION INTERVIEWS, the guidelines are updated. This refinement process makes the final framework provide tangible and actionable value for design practice.

8.2 The initial set of design guidelines

8.2.1 Topic 1: Motion graphics design, lesson flow and attention

Lesson	Design guidelines
0-5 mins	**(1) Trigger students' involuntary attention** Quickly attract students' attention and trigger ***involuntary attention***, guiding them into learning. **Effective attentional anchor** • Use video clips/animations as opening section. *Videos stimulate students' interest through continuous images and motion.* **Theoretical support** • **Design principle**: Motion-based visual elements attract attention more effectively than static elements (Faraday, 2000). • **Educational psychology**: Motion and visual change are key factors in triggering involuntary attention. **Visual design strategies for attention-attracting** **Strong contrast between stimuli** • Size contrast (e.g., large vs. small objects) enhances visual impact. **Stimulus intensity** • Images and graphics are more effective than text. • Colour contrast is more effective than text features (e.g., font style) in visual appeal. **Novelty and uniqueness** • Novel or unfamiliar visual elements trigger students' curiosity. • Repetitive content or format reduces interest. **Notes:** Novel elements may cause cognitive load; overly unfamiliar content may be hard to understand, while novelty stimulates curiosity and engagement. Design should balance attention capture with avoiding cognitive overload.

5-20 mins	**2) Clear expression, transformation to voluntary attention** Clearly presenting learning objectives helps students build expectations of learning outcomes and motivates them to complete tasks. It supports the development of ***voluntary attention***. **Design strategies**: • To ensure clear communication, information should be presented concisely and logically, avoiding redundant or irrelevant visual elements. • Combine the screen text with a simple, relevant graphics and ensure the teacher verbally articulates the objective. **Avoid distraction**: Over-decoration or off-topic graphics may distract students, reducing their focus and cognitive efficiency.
	(3) Visual accuracy and support interactive activities, maintain voluntary attention Activate students' prior knowledge or life experiences as a foundation for introducing new content, often through interactive activities to maintain ***voluntary attention***. **Design strategies**: • Graphic content should closely align with interactive activities to enhance teaching effectiveness and logical coherence, helping students understand the task purpose and engage actively. • Visual design should ensure visual accuracy and cognitive compatibility. Visual elements must match students' cognitive experiences to avoid misunderstanding and align with their existing visual impressions. For example, a 'bus' should look like the kind of bus students see in their city. • Motion effects should serve clear teaching purposes; there is no need to apply motion to purely decorative elements.

The speed of motion effects

The speed of motion effects should match students' reading and response speed to ensure they can clearly identify information and respond in time, maintaining attention and engagement. Lower-grade students need more time to react, so the motion speed should be slower to allow enough time for understanding. Effects that are too fast may cause students to fail to review and understand effectively.

Design strategies:

- Motion effects should match students' reading and response pace to ensure accurate visual recognition.
- For lower-grade students, motion effects should move more slowly, allowing sufficient time to process information and engage effectively in interactive activities.
- A single motion effect lasting about 3 seconds is acceptable, but further slowing down is possible, 3–5 seconds better fits lower-grade students' information processing pace.

(4) Reducing florid expressions for new content instruction

Simplify motion graphics during the presentation of new knowledge.

Design strategies:

- During this phase, students' attention is highly focused, so teaching content must be presented clearly and accurately.
- Employ minimalist layouts with high contrast and clear typography.
- The visual design should be receded, ensuring that the new content is the most salient element on the screen.
- Limit motion effects to foundational types like 'Appear', 'Fade', or subtle positional shifts that logically guide the reading. Avoid complex motion paths, decorative motion effects.

Static visual elements:

- White (colour) background is recommended:
  It improves readability and clarity by creating strong visual contrast with displayed content, which helps students focus and quickly identify key information.
  It allows teachers to adjust content easily, as it minimizes interference between background and content elements.

Using contrast between content and background colours is an effective strategy to optimise visual hierarchy and guide students' attention to key elements.

Motion effects:

- Use 'stillness' as a tool. After a motion sequence, allow for moments of visual calm to give students time to process information.
- Favor foundational motion types: Use simple effects like 'Appear', 'Fade', 'Wipe', or subtle motion paths that directly support the information's logic.
- Match effect speed to content familiarity. For new or complex information, use slightly slower, more deliberate motion. For reviews or familiar content, faster transitions are acceptable.
- Align triggers with key instructional moments. Set critical motion effects to trigger 'On-Click' rather than automatically. This gives the teacher control to present information precisely when it's needed.

Notes:

- Keep the decorative elements:
  For scenario-building: Use richer backgrounds and thematic elements to create an immersive atmosphere.
  For task completion: Minimize decoration or place it in peripheral areas to ensure content clarity and reduce cognitive load. Decorative elements can be placed at the page edges.
- Use distinct colour schemes for different sections as

	a visual cue to help students track the lesson flow and maintain rhythm. • Apply motion only to highlight key content, illustrate processes, or provide feedback. Avoid motioning decorative elements to keep the focus on the learning objective. **Student characteristics:** • **Attention is driven by visual prominence** Grade 2 students' attention is primarily captured by the most perceptually salient elements. Their interpretation of content and subsequent responses is strongly dictated by what stands out visually, such as the largest object, the brightest colour, or a moving element. • **High cognitive load from visual search** If key information is not made visually prominent, students must expend significant cognitive effort to locate and process it. This visual search task directly increases their cognitive load, which can lead to reduced learning efficiency, misunderstanding, and difficulty in completing tasks.
20-30 mins	**(5) Support interactive activities, enhance voluntary attention** Students enter the 'attention decline phase', showing signs of fatigue and distraction. ***Voluntary attention*** is reinforced through various interactive activities. **Design strategies:** **Direct interest guidance** Use students' direct interests to enhance learning motivation by designing elements that match their preferences.

1. Use of popular cartoon characters

- Using popular cartoon characters can effectively capture students' interest and attention. However, this carries a significant risk: highly salient characters can draw focus away from the core instructional content. When using popular characters, designers should place them in supporting roles or peripheral positions during moments that require high cognitive focus on text or new vocabulary.
- Designers should conduct prior research on current trends of cartoon characters to ensure the intended effect. As students' media exposure becomes more diverse, trends in popular characters change quickly.

2. Use familiar real-life contexts

Selecting cultural elements that align with students' real-life experiences can further enhance their engagement. When presenting such contexts, designers should consider regional cultural diversity and representative local environments (e.g., climate and landscape) in a concrete way to increase students' situational resonance and learning involvement.

Indirect interest guidance

For learning tasks that may be less inherently appealing (e.g., drills, repetition), stimulate engagement by designing for indirect interest. The motivation here comes not from the content, but from the successful completion of the task. Integrate gamified elements such as competitions, points collections. Opportunities to 'win; a game or receive positive reinforcement can effectively motivate students to persist through challenging or repetitive learning activities.

Competitive elements further enhance students' learning motivation, mainly due to their competitive nature and desire for teacher recognition and a sense of honour. Leveraging this characteristic significantly increases student engagement and interest in learning.

Interactive design strategies

In the mid-to-late stages of the lesson, new knowledge practice adopts diversified interactive activities.

- For one lesson, select a limited of 2-3 interaction forms (e.g., ‘Matching game’, ‘Q&A’, etc.) to establish a core interactive design framework.
- Introduce variation within the framework: vary thematic properties: maintain the core mechanics of an interaction but change its visual expression. Use different characters, backgrounds, or sound effects across different lessons to prevent monotony.

Effective interactive design: Interactive elements should not only be entertaining but also encourage active student participation and hands-on engagement. As long as the interaction closely aligns with learning objectives, experienced teachers can manage the pace well and prevent students from getting distracted.

Students’ preferences for Interaction

- **Immediate and unambiguous action feedback**: students respond positively to motion effects that provide immediate feedback on their actions, significantly enhancing attention and engagement.

  For example, a successful match could trigger a celebratory sparkle or a gentle pulse, while an incorrect attempt could result in a slight shake of visual elements. This closes the action-perception loop and immediately clarifies the outcome of the student’s action.

- **Voluntary control of motion effects**: Structure interactive tasks so that key events are triggered by the student’s own voluntary actions (e.g., clicking a button to reveal an answer, dragging a word to its picture) rather than being part of an automated display.

  The design can afford and encourage physical interaction. By allowing students to come to the smartboard to personally click, drag, or trigger an effect, the design facilitates a deeper level of classroom participation and ownership over the learning activity.

Design strategy for games (as a common form of interaction):

- Games are highly recommended for the middle-to-late stages of the lesson (i.e., the internalization and output stages). This placement ensures that the attention boost provided by the game serves the function of knowledge review and practice, rather than interfering with the concentration required for new knowledge instruction.
- Avoid placing games too early in the lesson, especially directly preceding or during the presentation of new knowledge. The excitement and distraction associated with gameplay are counterproductive to focused learning.
- The quality and function of games matter more than quantity; one game per teaching stage is recommended.
- Design games to specifically promote the application of newly learned knowledge. Games are particularly effective tools for enhancing language output, especially encouraging spontaneous oral communication and practice.
- Game pace can be relatively fast, as fast-paced activities help liven up the classroom, during mid-to-late lesson periods when students' attention may wane.
- It is important to regulate the frequency of similar games. Overusing the same type of game may cause novelty fatigue, reduce student enthusiasm and impact overall teaching effectiveness.

Integration of motion graphics and games

- For unfamiliar games: use clear, step-by-step motion graphics to visually demonstrate the rules and objectives before the game begins.
- For well-known games: a simple, iconic motion graphic (e.g., a spinning wheel icon that starts to spin) may be all that is needed to act as a brief visual

cue, activating the students' existing knowledge of the game.

- Use motion graphics as the direct entry point and central interactive element of the game. For example, the spinning wheel that the teacher or student can click to activate.
- The design should facilitate direct, human-computer interaction, allowing students or the teacher to trigger motion effects and see the immediate consequences.

Video use design strategy

- Place video clips in the middle of the lesson to help maintain student attention, ensuring the timing aligns with teaching objectives and the teacher's lesson plan.

Visual content in videos is more engaging than audio alone and can capture students' attention more effectively.

Notes:

- Students are easily distracted by irrelevant visual elements, occasionally leading to off-topic discussions.
- Although motion graphics effectively capture attention, excessive or repetitive use may divert students' focus.
- Currently, students show lower interest in static content and rely more on motion elements to maintain classroom engagement.
- Blurred images, incorrect information, or chaotic visual hierarchy weaken teaching effectiveness.
- Design must ensure decorative or illustrative elements do not obscure key information and avoid overly prominent visuals that interfere with information processing and comprehension.

	Summary Regardless of the strategy used to attract students' attention, designers must first clearly identify the key information on each slide. Effective visual design should consciously guide students to focus on the core instructional content rather than merely relying on attention-capturing elements. If students' attention remains fixed on appealing visual features without naturally transitioning to the learning material, the design fails to achieve effective attention guidance.
30-40 mins	**(6) Maintaining two facets of attention** Output and assessment occur simultaneously. Students enter the 'fluctuation and recovery phase' of attention, requiring alternating use of ***voluntary and involuntary attention***. **Design strategies:** • Motion graphics serve as tools for task guidance and attention elicitation. • Visual design should be more varied and flexible, task-oriented rather than decorative. • Interactive design should be varied and engaging to attract student participation to support both output and assessment phases. In the latter part of the lesson, video (clips or animations) can be reused to reengage students' attention (e.g., reviewing knowledge in a 'Let's Watch Together' stage). • In late lesson stages, combine collective viewing or storytelling with video to enliven the classroom. • Recommended video length is at least 20 seconds to help sustain student attention.

8.2.2 Topic 2: Motion graphics and situated learning in the classroom

Design focus:

1 Construct contextually meaningful simulated scenarios

- Motion graphics should not only aim for sensory appeal but also serve the construction of contextual scenarios.
- cenarios should be specific, coherent, and connected to real-life experiences to aid students' understanding of word meanings.

2 Contextual coherence

- The entire vocabulary teaching process requires a coherent contextual presentation (scenario).
- Coherent contexts help students understand and remember vocabulary, enhancing language fluency.

3 Thematic relevance and contextual consistency

- Each lesson has a theme, and scenario design must closely align with this theme.
- Every attribute of the motion graphics design should contribute to the construction of the specific contextual scenario.

4 Design according to the contextual requirements in lesson plans and interactive activities

- Interactive activities include specific contextual requirements for motion effects.
- Motion graphics should accurately present scenarios based on these lesson plans to ensure cognitive consistency.
- Avoid adding design attributes unrelated to the theme to prevent cognitive interference and contextual inconsistency.

Design considerations under situated learning:

Diversity of scenarios and characters

- Changing scenarios and characters help students understand vocabulary from multiple perspectives and reinforce core concept mastery.

The necessity of authentic contexts

- A design that lacks contextual cues can easily cause students to become confused about the location and use of the objects represented by the learned vocabulary, which may affect their correct understanding of word meanings. This confusion can weaken the connection between vocabulary learning and students' real-life experiences, reducing learning effectiveness.

Regional cultural backgrounds and cognitive patterns.

- Contexts inconsistent with life experience reduce comprehensibility.
- If the expression or context in motion graphics does not align with students' cognitive habits and life experience, students need more time to recognise and understand, which may reduce information processing efficiency.

Design strategies for contextual scenario:

- Ensure strong overall visual coherence of the context.
- Reducing the level of abstraction in contextual representation makes learning more effective.

Visual Focus: Students should pay more attention to the entire scene rather than a single character.

- Including local cultural elements reflects students' familiar living environment, making vocabulary meanings more practical.
- Choosing contexts closely related to students' daily lives helps them better understand the vocabulary.
- In situated learning, incorporating local cultural elements is a widely recognised and encouraged design approach by teachers.
- Designing scenarios that reflect students' daily life experiences more easily stimulates their curiosity and interest, promotes active cognitive engagement, and enhances comprehension.
- Contexts closely related to students' lives help them make associations more quickly and strengthen their sense of immersion.
- Localised design of teaching contexts.

Notes:

- Instead of relying on cartoon characters, guiding students to connect with real-life contexts helps them understand vocabulary more effectively and achieve learning objectives.
- Incomplete contexts can weaken the link between vocabulary learning and students' real-life experiences.

Application of diverse visual expressions

- Using various visual expressions (e.g., different scenarios under one theme) for the same content builds a more comprehensive cognitive framework.

The effectiveness of visual expression depends not only on quantity but also on its placement and timing within the lesson flow:

Adjust visual expression according to teaching stage

- Knowledge Practice stage: Students have a basic understanding and process information faster, allowing for more diverse visual expressions with less impact on teaching time apportionment.
- New instruction stage: Students encounter new content for the first time and need more time to process visual information; excessive or complex visuals may disrupt teaching pace and lesson flow.

Design considerations:

- Adjust the amount of visual expression flexibly according to lesson context and students' comprehension abilities; reduce visual effects when necessary to ensure teaching effectiveness.
- Designers should prepare multiple visual options for teachers to choose from to better adapt to different teaching goals.

8.2.3 Topic 3: Graphics and photos in visual expression

Design strategies:

- **Functions of photos:**
  - Suitable for presenting concrete, perceptible objects (e.g., apples, cars).
  - Appropriate for depicting real-life scenes and conveying information-rich content.
  - Can enhance semantic recognition and memory retention.
  - High realism supports the development of practical understanding.
  - When accurate information transmission is needed (e.g., for post-lesson field studies), using photographs is preferable.

- **Functions of graphics:**
  - Useful for illustrating human actions, background development, and abstract concepts (e.g., ideas).
  - Aesthetically appealing to young learners, helping reduce cognitive load and maintain attention.
  - High entertainment value effectively attracts and sustains students' attention.

- Prioritise graphics and use photographs as a supplement.
- Switch flexibly between expression types according to different instructional goals.
- Use photographs to emphasise the authenticity of the context and support the recognition of specific objects.
- Use graphics to illustrate instructional tasks and interactive behaviours, effectively capturing and maintaining students' attention.

Graphics, photos, and text combination

- Combining graphics, photos, and text is a direct and effective method for vocabulary input. Whether integrated with motion effects or not, this combination has broad applicability and positive effects in instruction.
- Excessive and frequent use of photos or decorative graphics can weaken the prominence of text as a key instructional element. This may impair the performance of the knowledge output chain and hinder language skill development.

- Select graphics or photos that are highly relevant and appropriate to the instructional goals, avoiding visual elements that overly disperse students' attention.
- Maintaining a close connection between graphics, photos, and text helps students better understand and remember vocabulary, enhancing the coherence of language input and output.

Notes:

- Most textbooks primarily use graphics as intuitive visual representations; therefore, it is not recommended to abruptly replace a large number of graphics with photographs, as this may disrupt students' continuity of understanding.
- In lower grades, using students' own photos or videos can increase classroom engagement but requires careful consideration of privacy rights; thus, personal photos are generally avoided.
- Students' divergent thinking may lead to off-topic discussions triggered by graphics or photos
- Control the complexity of visual content in both graphics and photos; overly complex visuals can confuse or distract students.
- Graphic design must clearly emphasize key content to prevent unnecessary discussion or confusion.
- Recognise functional differences across instructional stages: for example, in reading aloud activities, the main goal is to guide students to imitate sentences, making graphics and photos less critical. In stages that require context building, photos and decorative graphics can enhance immersion and interest, supporting instructional goals.

8.2.4 Topic 4: Instructions for modifying motion graphics

Design strategies:

- Embed clear and concise, action-specific revision instructions directly in the 'Notes' section of each slide to help teachers prepare efficiently.
- The instructions should be easy to understand and minimise extra workload or cognitive load during lesson preparation.

Design Considerations

- The design should consider for teachers' need to adjust motion graphics according to specific classroom situations.
- The design should reserve 'modifiable and operable space' to allow teachers to adjust as needed, supporting their professional judgment and classroom flexibility.
- Avoid designing motion graphics as fixed tools.
- Modification guidance should be simple, clear, and easily accessible, integrated into teachers' existing workflows to avoid adding extra burden.

8.2.5 Topic 5: Visual cues and visual consistency

Design strategy for visual cues:

- Use different character figures across lesson sections to serve as visual cues and context markers, helping students distinguish between sections and supporting contextual understanding.
- When character figures are used, their features must be visually distinct. Elements like clothing, posture, and expressions should be clear and recognisable to prevent contextual ambiguity.
- Incorporate familiar icons, such as a 'pointing finger' symbol, during reading activities to guide students to read content in sequence. This provides a clear and recognisable cue for reading tasks; without it, students may not fully understand the reading sequence when only characters and speech bubbles are present.

The use of materials from the textbook helps students connect their classroom learning to the textbook and reduces confusion due to unfamiliarity with the textbook.

Design strategies for applying material from textbook:

- Actively integrate textbook visual elements into key content, new concept explanations, and repeated practice phases to help students connect classroom learning with the textbook.
- In vocabulary instruction, use a variety of expression methods, with textbook visuals as an important resource to support comprehension.
- Ensure the novelty of instructional content by not relying solely on textbook material to maintain student interest.

- Maintain consistency in the depiction of textbook-specific characters that students recognise from primary English learning materials. This helps bridge classroom activities with the textbook, strengthening learning continuity.

Design strategies for visual consistency:

- Maintain consistent visual cues
  Use similar designs for functionally identical elements in motion graphics (e.g., dialogue boxes, buttons, prompt icons) to help students quickly recognize their purpose, reduce explanation time, lower cognitive load, and improve teaching efficiency.
- Enhance consistency through repetition
  As noted by Williams (2015), repetition is an effective way to achieve visual consistency. Repeating colours, shapes, fonts, or layouts connects separate components organically, strengthening overall design unity and coherence.
- Uniformity of characters
  - Use consistent character images within the same lesson to enhance content continuity and facilitate student comprehension.
  - Consistency across different lessons is not essential, as students may have limited memory of characters from previous lessons. Maintaining uniformity within a lesson is more beneficial, while flexibility is allowed across lessons.

Consistent visual cues help establish stable learning expectations, guide student actions and comprehension, effectively motivate learning behaviours, and minimise distractions or misunderstandings caused by visual inconsistency.

8.2.6 Topic 6: Intuitiveness of visual expression

Primary school context

Grade 2 students rely heavily on direct and intuitive visual input to process information. For example, an image of the ‘sun’ instantly helps students associate it with ‘hot weather’. In the absence of such visuals, many students may struggle to understand or respond to text alone.

Visual design for this age group should be simple, clear, and explicit, aligning with their cognitive development stage.

Design strategies for intuitive understanding:

- Clarity and accuracy: all design properties should directly and accurately convey the intended information, minimizing cognitive load and enhancing comprehension and engagement.
- Avoid ambiguity: animation and graphics should avoid complex or ambiguous visual metaphors unless a specific instructional goal requires guided reasoning or inference.
- Limit visual complexity: overly complex or vague visuals increase the difficulty of understanding and may reduce students’ motivation or interest.
- Reduce excessive association: visual details that easily trigger unrelated associations should be avoided to help students stay focused on the learning content.

Clear content-to-visual correspondence

The clearer the link between content and its visual representation, the more easily students can understand word meanings and usage intuitively.

8.2.7 Topic 7: The impact of familiarity

Differences in student response to content familiarity:

Familiar content:

- When content is familiar, students build on existing knowledge, which often leads to more active and confident participation.
- Repeated exposure to familiar content can strengthen students’ sense of achievement and engagement.

- Familiar visual elements (such as well-known characters, icons, or established visual cues) are more likely to capture students' attention and sustain interest.
- Familiar elements can create a conditioned response, students begin to associate specific visuals with certain tasks or activities.
- Excessive repetition of familiar content can reduce interest, leading to a monotonous learning experience.
- Designers should control the frequency of familiar elements to avoid rote learning and maintain variety.

Unfamiliar content:

- Students typically need more time to process and internalise unfamiliar information.
- Encountering new content can make some students reluctant to participate, especially if they fear making mistakes.
- Novel visual designs can bring a sense of freshness to lessons, stimulating students' curiosity and willingness to explore new knowledge.

Design strategies:

Functional consistency:

All visual design that serve navigational, functional, or procedural purposes should maintain a high level of consistency and repetition. This consistency helps establish stable learner expectations and facilitates the automation of cognitive processing, the creation of effective visual cues.

Contextual novelty for core content:

When presenting core teaching content, such as vocabulary, novelty can be introduced through variations in scenario settings, cartoon characters, or formats of interaction. This sense of novelty effectively should captures attention and sustains learning motivation.

Design strategy of combining new and old:

The simultaneous presentation of new teaching content alongside unfamiliar interactive format should be avoided. When introducing a difficult and new vocabulary, it is advisable to use the interaction format that students are already most familiar with. Conversely, when deploying a new, potentially cognitively demanding interactive format, it should be paired with content that students have already mastered.

8.2.8 Topic 8: Text

Text size design strategies:

- Use 32pt for main body text and key content.
- The minimum recommended text size is 28pt to ensure readability for students sitting at the back of the classroom.

- Text size can be adjusted slightly depending on screen resolution and display size.
- Use larger text for keywords and titles to enhance visual emphasis.
- Use smaller text (24pt) for prompts or subtitles, but ensure they remain clear and do not overcrowd the slide layout.

Suggested sizes for functional text:

Course title: 36pt
Unit or chapter title: 40pt
Section labels (for teachers only, who is close to the screen): 12pt

Text colour design strategies:

- Black is the default for text on white backgrounds. The strong contrast supports high readability.
- White is suitable for text on dark or colourful backgrounds.
- Avoid green text, as it appears blurry on screens.
- Use red to highlight keywords or important points. Red stands out well visually and is familiar to students as a marker for key information. Other high contrast highlight colours can also be used, but red is commonly preferred for its clarity and association with emphasis.

Note: Avoid overly bright colours in text. Always ensure sufficient contrast between text and background to maintain legibility.

Font (typeface) selection:

- Using a font that matches the textbook helps maintain cognitive consistency, especially for students who are still learning handwriting.
- Inconsistency in font use between motion graphics and textbooks may confuse and reduce learning efficiency.
- Font familiarity enhances recognition and reading speed, while new or unfamiliar fonts require visual adjustment, potentially slowing the reading

process.

- Handwritten-style fonts (COMIC SANS MS) are acceptable, as they are clear and support word recognition for students.

Note:

- Font selection should consider whether handwriting learning is part of the curriculum.
- Teaching and learning practices vary between regions and schools, so font choices should be flexible and responsive to local needs rather than rigidly standardised.

8.2.9 Topic 9: Colour

Design strategies:

- Using highly saturated colour schemes tends to be more preferred by students.
- Use vivid colours to attract attention, enhance engagement, and increase content appeal.
- Use varied colours to boost visual engagement; strict colour consistency isn't required.
- Use bright colours (high value) instead of darkness, as preferred by teachers.
- 'Cool' tones, with a blue leaning, are recommended.

- Avoid large areas of pure red, which can be overwhelming.
- Avoid greenish tones as they resemble blackboard colours (Chinese classroom settings) and can cause visual fatigue.
- Use fluorescent colours sparingly to avoid eye strain
- Avoid using similar colours for different information presentation, as it weakens visual hierarchy.

Design consideration:

- Highly saturated colours may cause visual discomfort for students sitting close to the screen. A balance must be considered between colour richness and visual clarity.
- Colour use should consider the teaching environment, especially whether motion graphics colours are too similar to surrounding colours (such as

blackboards or projection screens).

- Be mindful of colour connotations to avoid misleading students or causing interpretive bias, particularly in tasks requiring critical thinking.
- Maintain a clear visual hierarchy through contrast; ensure key content is visually prominent while secondary elements are subdued.
- Students understand colours intuitively and perceptually. The purposeful use of colours can help students to understand visual content; on the contrary, negative preferential associations with colours may reduce students' engagement with the motion graphics.

8.2.10 Topic 10: Sound

Design strategies:

- Use character voiceovers and ambient sound effects (e.g., natural sounds, conversational voices) to enhance students' sense of immersion and realism.
- Employ voiceovers to support vocabulary input and pronunciation modelling, especially in speaking-focused lessons.
- Utilise voice recordings from children to enhance appeal and capitalise on peer effects.
- Incorporate context-relevant sound effects (e.g., knocking, explosions) to promote engagement among students.
- Ensure audio aligns closely with visuals, for example, use 'dripping' sounds for rain scenes and 'whooshing' sounds for wind.

- Add sound effects to games to enhance enjoyment. Limit the frequency of use, one to two sound cues per game are recommended. Control the volume, where possible, to prevent overly loud sounds and startling students.
- Integrate audio strategically during the 'input section' to capture attention, and reduce its use during the practice and review sections.

- Provide audio controls such as play, pause, and replay, particularly for reading aloud and pronunciation practice.

Combining visual and auditory input enhances memory retention and comprehension, improving cognitive processing efficiency.

Sound functions as a stimulus to capture students' attention, especially when contextually aligned with the visual content.
Personified voices and child voiceovers increase emotional engagement and psychological proximity, facilitating language internalisation.
Realistic background audio and interactive sound effects enhance authenticity and help students connect learning content with real-world contexts.

Notes:

- Computer-generated voiceovers may lack natural intonation and emotional expression, which can hinder pronunciation modelling and comprehension.
- Poor audio quality, overly fast speech, or unclear articulation increases cognitive load and impedes language input.
- If audio playback is not controllable (e.g., no pause or skip function), it may disrupt the teacher's control of classroom pacing.
- The reading speed of human voiceovers must be regulated; excessive speed can prevent students from keeping up.

8.2.11 Supplementary topics

8.2.11.1 Motion effects trigger controls

Design strategies:

Differentiate effects Triggers Based on Instructional Function

- Use automatic appearance for procedural or contextual content such as background information, slide transitions, character entrances, or non-essential dialogue. This supports smoother classroom flow and minimizes teacher workload.
- Reserve click-triggered effects for critical instructional moments, e.g., student answers, teacher explanations, or key interaction prompts, to enhance engagement and control.

Avoid Unnecessary Clicking to Simplify Teaching Operations

Motion effects that do not serve a direct instructional function should not with the click-trigger, so as not to increase the complexity of the teacher's operation and interrupt the rhythm of the classroom.

Align motion effects Flow with Teacher's Instructional Rhythm

The sequencing of effects should match the speech and teaching rhythm.

For example, display background context automatically, then reveal student responses or key content via clicks to maintain coherence and clarity.

Clicks for Instructional Emphasis
Click-trigger should mostly be used when teacher intervention, focus, or explanation is needed. This reinforces the pedagogical hierarchy and prioritizes essential content.

8.2.11.2 Slide transition effects

Design strategies:

- Adding slide transition effects enhances overall visual coherence and viewing experience.
- Transitions that align with content changes strengthen the unity between content and display format.

8.3 VERIFICATION INTERVIEWS: insight from designers on initial design guidelines

8.3.1 Collecting comments from teachers through interviews

The semi-structured in-depth interviews are still used as the data collection method of VERIFICATION INTERVIEWS. The main objectives are:

1. **To identify the novelty and contribution of the guideline principles**
   Assess the scope to which the core principles offer professional designers novel perspectives or a systematised body of knowledge that transcends established practices and intuitive approaches. This involves evaluating the degree of novelty and inspirational value across different topics within the guidelines for designers, thereby guiding the reorganisation and prioritisation of research findings.

2. **Assessing practical applicability**
   Evaluate whether the principles within the guidelines are deemed feasible, operational, and genuinely beneficial in design practice.

3. **Identifying gaps, limitations and avenues for improvement**
   This aims to uncover potential weaknesses, overlooked considerations or areas of conflict within the guidelines. This includes soliciting

constructive criticism and suggestions for enhancement to strengthen the comprehensiveness.

4. **Gather feedback on the guidelines as a design outcome**
   Assess the clarity, structure, and overall usability of the guideline documentation itself. This objective focuses on understanding how information should be presented to maximise utility for a professional design audience (designers) and ensure ease of use.

5. **Understanding existing mindsets and workflows**
   Gain deep insights into the current approaches, intuitive processes, and challenges faced by designers. This establishes a baseline for measuring the contribution value of the new guidelines.

The VERIFICATION INTERVIEWS are conducted in Mandarin. Anonymous in the same manner, using pseudonym (e.g., Designer 1). The interviews are also conducted in a mixed format, either online or in person.

8.3.2 Profile of participants

There are 5 participants in total, they all professional practice designers. The following table (Table 6) provides an overview of the participants and their professional fields:

Date of interview	Participant	Format of the interview	Duration of interview	Professional fields
19 September 2025	Designer 1	Online	01:23:05	Motion graphics designer and researcher
19 September 2025	Designer 2	Online	01:38:21	Graphic designer
19 September 2025	Designer 3	Online	01:15:12	Animation creator
20 September 2025	Designer 4	Online	01:08:27	Graphic designer
20 September 2025	Designer 5	Online	00:49:31	Senior graphic designer

Table 6: Overview of the participants

8.3.3 VERIFICATION INTERVIEWS scope

The main purpose of the interview is to enable the designers to make a detailed evaluation of the new framework based on their existing knowledge. The interview process is divided into 3 stages:

Scenario setting: to capture the participants' professional intuition, the interview first sets a realistic design scenario (designing instructional motion graphics for grade 2 primary school students). Then, the participants are asked about their initial, unprompted approaches to the task.

Thematic inquiry: the core part of the interview systematically introduces the key topics of the design guidelines. After presenting each topic, the researcher pauses to invite the participants to provide detailed feedback.

Synthesis and critical reflection: at the end of the interview, the discussion shifts from specific details back to an overall perspective. The participants are invited to share their general impressions of the guidelines, to identify any perceived gaps or limitations, and they are also invited to share any 'disruptive' or fundamentally different ideas. This final stage aims to encourage synthesis and a critical evaluation of the guidelines.

The design of the questioning strategy does not aim to test knowledge but serves as a series of prompts for professional reflection. The questions are classified as follows:

- **Foundational questions**: these are broad, open-ended questions linked to the design scenario (for example, 'what would be your first step?'). The purpose is to elicit the participants' default workflows and professional 'design sense' without any external influence from the guidelines.

- **Thematic questions**: for each topic of the guidelines introduced, the interview uses a consistent set of questions to evaluate three key aspects:
    - Alignment with practice: 'Does this align with your own approach?'
    - Novelty and originality: 'Is there any guidelines mentioned that make you feel particularly new, or conversely, simply confirm what you already do?'
    - Practical utility: 'Do this guidelines provide a useful perspective for your work?'

    - This consistency in probing ensures that comparable data is collected from all participants for each topic.

- **Summative and critical questions**: the final set of questions aims to encourage participants to move beyond reactions to individual themes and instead evaluate the guidelines as a whole. Questions such as ‘what do you think is missing from the guidelines?’ and ‘are there any principles you would disagree with?’ aim to identify the limitations of the research and reveal potential directions for future study.

8.3.4 Results of the VALIDATION INTERVIEWS

Based on the purpose of the interviews, the findings are presented in three sections:

1. The ‘inspiring and novel’ design guidelines

This section presents the insights of 5 designers regarding the design guidelines they consider ‘inspiring and novel’. Across the interviews, it becomes clear that the guidelines that resonate most strongly with the designers and are regarded as valuable are not isolated aesthetic or technical suggestions, but rather interdisciplinary strategies that deeply integrate design practice with educational goals, cognitive science, and real classroom scenarios. These guidelines successfully provide designers with the ‘macro perspective’ and ‘theoretical grounding’ that they may overlook in daily work, elevating their thinking from ‘how to do’ to ‘why to do’ at a strategic level.

1. Integration of interdisciplinary theories provides scientific grounding for design decisions

The designers generally agree that integrating theories from pedagogy and cognitive psychology into design principles is the most innovative and inspiring part. This approach offers a deeper foundation for design decisions beyond aesthetics or personal experience, making them more strategic and persuasive. They consistently note that guidelines which explain the 'why' behind design choices, connecting students' cognitive patterns (such as attention shifts, cognitive load, and familiarity principle) with specific design strategies, provide new dimensions of thinking. For example, Designer 3 explicitly points out that using students' 'familiarity' with content to guide teaching was a knowledge blind spot: 'but the degree of familiarity, and its impact on them, is something I really never thought of before.'

2. Establishing cross-media visual consistency

A repeatedly mentioned and 'unexpected' key insight is the emphasis on maintaining visual consistency between instructional motion graphics and the physical textbook. This requires designers to adopt a broader 'learning ecosystem' perspective. Designers report that the guidelines make them realise that ensuring visual continuity across in-class and out-of-class learning materials reduces cognitive dissonance and consolidates learning outcomes. For instance, Designer 2 sees this as a 'macro perspective' beyond daily practice: 'the connection between these visual elements and the textbook… This is something I normally would not pay attention to in my design.'

3. Matching teaching flow and student attention

The inspiring guidelines are not static, universal rules, but strategies closely tied to the dynamic flow of classroom teaching. The designers show strong agreement with the idea of dividing a lesson into stages and dynamically adjusting design intensity based on students' attention curves. They agree that design should serve teaching rhythm. Designer 3 admits, without such guidance, their design thinking would not reach this level of detail: 'But I would not be so specific, like designing according to different lesson stages.'

4. Making tacit knowledge explicit

Finally, the designers agree that the value of good design guidelines lies not only in providing new knowledge but in transforming fragmented, intuition-based insights into a systematic, comprehensive, and articulable framework. Such structuring enhances the clarity and completeness of their design awareness. The guidelines turn vague design intuitions into clear principles, making designers' thinking more organised and warning them against blindly applying general design habits to educational contexts. As Designer 5 concisely summarises: 'it feels more systematic (…) Without saying it, maybe I wouldn't think so comprehensively.' Without explicit reminders, designers risk making mistakes: 'designers may naturally use fonts they usually apply, but these may not be suitable for elementary students.'

Summary

For the designers, the inspiring and novel elements of the initial guidelines include:

- Theoretical depth (integration of cognitive psychology and pedagogy)
- Macro perspective (linking cross-media learning experiences)
- Dynamic thinking (aligning with real teaching processes)
- Systematic framework (making tacit knowledge explicit)

2. Design guidelines considered 'common sense and intuitive'

This section focuses on content that all designers regard as 'professional common sense' or 'design intuition'. Analysing these consensus points helps clarify the starting baseline of the guidelines, showing which areas belong to the designers' 'known domain', and highlighting the added value of the 'novel and inspiring' content in the first section. While these foundational principles may be common sense for experienced designers, explicitly including them in guidelines is essential for standardisation, ensuring baseline quality, and guiding novice designers.

1. Basic principles of visual communication: clarity, simplicity, functionality

The most frequently mentioned 'common sense' domain concerns the fundamentals of visual communication. The designers agree that in any context, especially in education, design must serve the clear transmission of information, and visual elements must not overshadow content. As

Designer 3 instinctively responds when asked about core instructional design: ‘I think the most important part is definitely to keep it simple and highlight the key points, not make it overly fancy.’ Regarding colour use, Designer 1 sees avoiding inappropriate colours as a design nature: ‘I think this part relies more on the designer’s intuition.’

2. Synchronisation with source materials

The designers see maintaining consistency with given source materials (such as textbooks) as a basic requirement. They report that their workflow begins with reviewing existing materials and extracting relevant visual elements. Designer 3 states: ’I would definitely start by looking at the textbook content, then extract elements from it.’

Notably, the principle of ‘visual consistency between motion graphics and textbooks’ shows dual characteristics. On an operational level (‘need to maintain visual consistency’), many designers consider it professional common sense. However, when the guidelines reveal the deeper pedagogical rationale, avoiding students’ ‘cognitive dissonance’, this is seen as an inspiring insight. For this reason, this analysis result classifies it under ‘inspiring and novel’ content, as it adds theoretical depth and strategic value to design practice.

3. Editability of teaching material

Providing clients (teachers, in this research’s context) with flexible and modifiable is considered common sense. Designers expect that end users will need to make adjustments, so ‘leaving room for modification’ is seen as intuitive. Importantly, Designer 4 adds that while ‘editability’ is common sense, the true challenge lies in making edits easy for non-professionals (teachers), which goes beyond intuition and requires innovation.

4. General professional processes and intuitive judgments

This includes standard workflows and quick, experience-based judgments that designers have internalised. Examples include establishing a baseline style for children as the target audience, ensuring narrative coherence, and making functional choices between visuals such as graphics and photos. For instance, Designer 1 emphasises narrative coherence as a basic requirement: ‘ensuring contextual consistency. That should be known.’

Summary

The content designers regard as ‘common sense’ revolves around universal principles of visual design, fidelity to source materials, flexibility of deliverables, and standard workflows. These form the ‘operating system’ of their professional knowledge. A comprehensive design guideline must build upon this consensus while also providing deeper, field-specific insights that go beyond.

3. Suggestions and needs regarding the presentation of design guidelines

The analysis reveals a clear and consistent set of needs among the designers. For the guidelines to be effective and actionable, they must go beyond abstract theoretical statements and become a tangible, operational, explanatory, and empowering tool. Designers do not need an academic monograph; they need a ‘super brief’ that can be directly translated into productivity.

1. Emphasising actionability

Designers need a bridge between abstract principles and concrete design actions. They expect the guidelines to be illustrated through concrete forms such as cases, templates, visual examples, and quantitative standards:

> Designer 1 points out the problem of theoretical abstraction: ‘But just from this guideline, I feel it may be a bit… Abstract, very abstract.’ They suggest using a single continuous case to demonstrate all principles.
>
> Designer 5 directly states a preference for examples: ‘If you explain with practical examples, I will understand better than with abstract text.’
>
> Designer 2 hopes for clearer visual contrasts and quantitative standards to grasp design ‘degree’: ‘I think if there is a kind of standard like this, it would be more helpful.’

2. Explaining the ‘why’

Designers need not a checklist of mechanical orders, but logical explanations that they can believe in and apply creatively. Understanding the ‘why’ behind each guideline is key to internalizing guidelines into their design thinking. Designers request that every recommendation be paired with its rationale or theoretical basis, explaining why it matters:

> Designer 4 stresses this most strongly: ‘you need to give me a reason… You need to tell me the logic behind it.’

Designer 2 also emphasizes that without deep logic, surface rules feel confusing: ‘I don’t know if these suggestions have a deeper logic… Yes, a theoretical basis would highlight their importance to designers.’

3. User-oriented structure and presentation

Designers expect the guidelines themselves to be well-designed, with a clear structure that distinguishes different user needs (designers vs. teachers) and provides differentiated content:

Structural optimization: Designer 1 suggests reorganizing the current somewhat chaotic logic, using tools such as tables or flowcharts: ‘I think you could segment by teaching stages, and then mark the key points for each.’

Audience distinction: Designer 4 notes that the guidelines serve two groups, and presentation must differ. For teachers especially, editing guidelines must be simplified: ‘this part is not for designers, this part is for teachers. Teachers are not designers.’

Layered reading: Designer 1 suggests providing both ‘detailed theory’ and a ‘quick reference manual,’ to suit deep learning and fast project use.

4. Becoming an empowering brief, not a creative constraint

Designers agree that clear guidelines do not limit creativity but instead provide a stable framework for more confident and efficient work. The guidelines should empower rather than constrain, by setting boundaries and providing ‘negative lists’ (what to avoid) rather than strict prescriptions. Designer 4 proposes: ‘it should say avoid doing this, rather than telling you must do this… Because there are too many possibilities.’

Summary

For guidelines to be effectively used by designers, their success lies in presentation. They must be designed as a product themselves, with core features including:

- Concrete presentation with cases and templates
- Explanatory core that clarifies the ‘why’

- User-centred structure with layered and visualized formats
- Empowering orientation that frames them as enablers rather than constraints

8.4 Guidelines updating

The VERIFICATION INTERVIEWS aim to evaluate the clarity, relevance and practical applicability of the content from the perspective of the designers of the design guidance. Comments from designers revealed a crucial insight: **in the effective design guidelines, the manner of presentation and organisational structure are equally important to the content itself.** Designers confirmed the value of the interdisciplinary, evidence-based principles identified in this research, yet explicitly stated they require a format that is more actionable, explanatory and user-oriented than a simple list of recommendations. Therefore, based on the insight from designers, the design guidelines have been revised by the following approach:

1. **Transition from a 'topic list' to a 'strategic framework'**: the existing linear structure organised by 'topics' should be redesigned. The revised framework should first present novel macro-strategic principles (e.g., design must match the attention curve; establish cross-media consistency) to provide a macro perspective. It will then elaborate on guidelines specific to particular design domains (e.g., colour, font, interaction).
2. **Prioritising 'operability' and 'interpretability'**: Each design guideline should be restructured to follow a consistent 'strategy + principle + example' format. The 'principle' section should clearly explain the rationale behind each recommendation, linking it to findings from cognitive psychology or pedagogy research. The 'Examples' section should translate abstract principles into concrete directives through visual illustrations, quantifiable benchmarks (e.g., '3–5 seconds'), and 'negative lists' (what to avoid).
3. **Adopting a user-centred hierarchical structure**: recognising that design guidelines serve diverse needs, the final deliverable should be designed for layered reading. It will comprise a 'designer quick reference checklist' for designers to consult swiftly during projects, alongside a separate, simplified 'teacher revision guide' focused on fundamental editing tasks.

Through this iterative process of gathering user feedback and redesigning deliverables, the final design guidelines are assured to be not merely an academic research outcome, but a practical, empowering tool that designers can effectively integrate into their professional workflows.

Chapter 9 | Synthesis

9.1 Introduction

To achieve the core objective of this study, which is to provide targeted design guidelines on the use of motion graphics as a teaching tool in English vocabulary instruction in Chinese primary schools, this research follows the methodological pathway of Educational Design Research (EDR), going through key stages including needs and context analysis, design, development, and contrast and iterative testing. In consideration of the particularity of the research context, a semi-summative evaluation is adopted in the design validation process to enhance continuous feedback and design optimisation.

As the final integrative chapter that consolidates this research, this chapter systematically reviews and connects the theoretical foundation, research design, and empirical findings presented in the previous chapters:

- Chapters 2, 3, and 4 provide the literature review, theoretical support, and contextual framework of this research, defining the basic identification of motion graphics and its educational application context.
- Chapters 6 and 7 present the process of data collection and analysis, including interim findings such as teachers' and students' usage feedback, behavioural motivations, and design preferences in the real teaching context.
- Chapter 8 presents the validation and updating of design guidelines. By collecting comments from professional designers regarding the guidelines, insights are gained into how to create design guidelines that are both inspiring and practically effective. Based on these insights, the design is subsequently updated.

This chapter further elaborates the interrelations and logical integration among the above, highlighting the core findings of this research regarding each design guidelines topic. The final design guidelines are presented in the following Chapter 10.

9.2 Responding to the research objectives

The generation of the design guideline is informed by different components of this research in response to each design question and its corresponding objectives raised in Chapter 1. The following revisits these design questions and explains how the research process addresses them.

1. What is the definition of motion graphics in this research?

In response to this research question, it is necessary to clarify that the definition of 'motion graphics' in this research is contextualised for a specific research setting, English vocabulary learning in Chinese primary school classrooms. Therefore, relying solely on the general definitions of 'motion graphics' found in academic literature is insufficient. This study emphasises the combination of existing academic concepts with the understanding and usage experiences of teachers and students in real teaching contexts, in order to obtain more targeted design needs and to provide designers with more precise design guidelines.

In Chapter 2, a discussion matrix is created to map out the fundamental discussions of the concept of motion graphics found in existing research. However, most of these discussions consist of rather broad and loosely defined concepts, lacking reference to specific educational contexts, that is, the particular usage of motion graphics in this research. Therefore, Chapter 6 further develops the concept from the teachers' perspective, integrating how motion graphics are presented in real classrooms, particularly in the format of PowerPoint presentations, to extract the specific connotations of 'motion graphics' in this research. The process is based on the categories of design properties of motion graphics summarised in the discussion matrix in Chapter 2 (Section 2.6), and filtered through the findings of Chapter 6 to select those design properties that are highly relevant to the instructional setting of this study, thus constituting the context-specific definition of 'motion graphics' in this research. This definition not only answers the research question 'What is motion

graphics in this study?' but also specifies the categories of motion graphics design properties that are the focus of this research.

2. How do teachers and students interact with motion graphics in the classroom as an educational tool?

In response to this research question, the data collection and analysis focus on how teachers and students use and interact with motion graphics in teaching contexts. Through 3 rounds of teacher interviews described in Chapters 6 and 7, specific cases are collected regarding how teachers use motion graphics during teaching. These uses include both motion graphics already present in their original teaching materials and new designs introduced through the prototype teaching material tested during the research process. Each interview deepens the understanding of teachers' usage behaviours and further reveals how the design of motion graphics is influenced by instructional needs and teachers' experiences.

In addition, as outlined in Chapter 5, students' interaction with motion graphics is primarily obtained indirectly through classroom observations by the teachers. Teachers report on students' changes in attention, behavioural responses, and levels of engagement with learning during lessons, thereby understanding the potential impact of motion graphics on instructional interaction.

3. What do students and teachers assess about current educational tools which incorporate motion graphics?

Inferring teachers' potential design needs only from their observed usage behaviours is insufficient. Teachers' specific ways of using motion graphics in the classroom not only reflect their instructional purposes and habits but also contain underlying motivations and thinking patterns. Information about motivation can offer designers more diverse design possibilities, not merely responding to observed behaviours, but enabling designers to understand the teachers' needs. The specific design suggestions and improvement proposals actively put forward by teachers during the interviews constitute highly valuable 'subjective design needs' in this research. These suggestions are practical, targeted, and feasible, providing clear directions for further optimisation of motion graphics in instructional contexts.

Students' feedback mainly derives from the prototype teaching test described in Chapter 7. After understanding the design intentions behind the motion graphics in the prototypes, teachers describe, based on classroom observations, how students respond to different design adjustments. These responses make it possible to judge whether particular design changes produce positive effects in teaching, and whether the corresponding design insights can be considered effective for instruction and thus established as design guidelines.

4. What design guidelines can inform the design of motion graphics to support the English classroom education?

The final research question aims to synthesise all preceding research findings in order to construct practical design guidelines for motion graphics, intended to support English language learning in Chinese primary school classrooms. This question not only concerns the theoretical possibilities of design but also emphasises the implement ability and effectiveness of the guidelines within real teaching environments.

The response to the first research question clarifies the definition of 'motion graphics' within the context of this research and delineates its scope of application, thereby identifying the categories of design properties that need focus. This foundation ensures that the development of the design guideline is directed towards clearly defined content and users. The exploration of the second and third research questions further informs and advances the development of the design guidelines. Throughout the research, responses to the second and third questions are iteratively generated through data collection and analysis, jointly contributing to a deeper understanding of the use of motion graphics in real classroom contexts. These data not only reveal the strengths and limitations of current educational tools but also offer entry points for optimisation from a design perspective.

By addressing the above research questions, the research is able to progressively construct a set of data-driven design guidelines for motion graphics that are closely aligned with the practical realities of classroom instruction.

9.3 Multi-dimensional framework for instructional motion graphics

The following synthesises this research's core findings into a multi-dimensional framework. This framework provides a more holistic design guide for motion graphics, addressing the complexities identified in this research concerning primary classroom teaching in China.

9.3.1 The reconciliation paradox: a dynamic regulatory model for integrating cognitive efficiency and learning motivation

This research reveals a core paradox inherent in the use of motion graphics as a teaching tool, a paradox that can and should be reconciled through design. This tension manifests as a difficult choice for designers between two competing demands: the pursuit of **cognitive efficiency** and the **learning motivation**.[1]

Within the framework of this research, cognitive efficiency is defined as the minimisation of unnecessary extraneous cognitive load on the learner (Sweller, 2011, Mayer and Moreno, 2003). Learning motivation refers to the arousal and maintenance of students' situational interest and persistent effort (Hidi and Renninger, 2006, Ryan and Deci, 2000). The former requires that the design should be simple, consistent and predictable to reduce the burden of cognitive processing. The latter relies on novelty, engagement, and diverse elements to attract and maintain students' attention. This research suggests that designers should understand this contradictory relationship and strategically utilise it to avoid the twin pitfalls of design that is 'too repetitive and thus boring' or 'too novel and thus distracting'.

Therefore, this research proposes a **dynamic and layered regulatory model**. This model posits that cognitive efficiency and learning motivation are not mutually exclusive choices. Instead, designers can achieve their synergistic effect by implementing more precise, differentiated regulation at both the macro level of the teaching process and the micro level of design properties:

1 See EVANS, P., VANSTEENKISTE, M., PARKER, P., KINGSFORD-SMITH, A. & ZHOU, S. 2024. Cognitive load theory and its relationships with motivation: A self-determination theory perspective. Educational Psychology Review, 36, 7.et al. This study discusses how instructional strategies that reduce extraneous cognitive load can affect student motivation and engagement, highlighting a potential tension between maintaining cognitive efficiency and supporting motivation.

1 The principle of ‘non-aligned attention regulation’ based on teaching processes

At the macro level, this research introduces the principle of ‘non-aligned attention regulation’. The core tenet of this principle is that the intensity of visual stimulation in motion graphics should not have a simple positive correlation with the importance of the teaching phases. Rather, it should be dynamic and, at times, inversely related, depending on the students’ cognitive state and the pedagogical goals of each phase.

Core knowledge instruction stage (e.g., Phase 4): prioritising cognitive efficiency

During the core phase of teaching new knowledge, students’ intrinsic cognitive load is at its highest as they must allocate significant cognitive resources to understanding and constructing new information. According to Cognitive Load Theory, for novice learners, such as the primary school students in this research, any visual information extraneous to the core learning task risks imposing extraneous cognitive load (Sweller, 2011). This is corroborated by participating teachers who emphasised that all visual content in motion graphics during this stage must be intuitive and essential. Direct evidence from this research’s classroom tests showed that introducing overly ornate or complex motion graphics at this phase led to ‘attention misfocus’, where students’ attention shifted from the instructional content to the visual effects themselves. Consequently, the proposed design strategy, from this research, is a ‘strategic visual simplification’ and reduction of visual stimuli to prioritise cognitive efficiency.

Attention decline and knowledge consolidation stage (e.g., Phase 5): prioritising learning motivation

When the teaching into a phase where students’ attention wanes and interactive activities are needed to consolidate new knowledge, the role of motion graphics shifts from aiding comprehension to motivating participation. Practical teachers confirmed that using interactive designs with high-appeal visual stimuli during this stage is effective in re-engaging students and drawing their attention back to the learning task. However, the use of visual stimulation is not without restraint. This research finds that there is a ‘boundary’ for the application of colours. Teachers have reported that although high saturation and high brightness colours can enhance students’ concentration, once they exceed a certain limit, they will

instead make students feel ‘dazzled’, turning what is originally a beneficial stimulus into an interference that increases the external cognitive load.

The comparison between the above two stages confirms that there is a ‘non-aligned relationship’ among the design of motion graphics design, the teaching flow and students’ attention, which also constitutes a feasible basis for the principle of ‘non-aligned attention regulation’ principle.

2 The differentiated familiarity strategy

Having established the macro-level principle, this research further proposes a second regulatory mechanism at the micro-level of the design: the ‘Differentiated Familiarity Strategy’. This strategy, informed by Norman (2007)’s theory of Emotional Design, addresses the ‘familiarity paradox’ by proposing how motion graphics can simultaneously achieve low cognitive load and maintain high learning motivation.

The behavioural level: leveraging familiarity for cognitive efficiency

For functional design properties within motion graphics, such as Section indicator, a high consistency and predictability are paramount. When students are familiar with these visual cues, it fosters automatic recognition, allowing them to process information without expending additional cognitive resources. This ensures classroom efficiency. For instance, teachers confirmed that consistent and repetitive visual cues effectively reduced the time needed for explanations. Similarly, the use of red to mark key text had become an established ‘visual convention’, which teachers noted is most effective because students are ‘already used to it’. This demonstrates the value of familiarity in ensuring efficiency.

The visceral and reflective levels: leveraging novelty for learning motivation

For design properties related to sensory appeal and engagement, such as cartoon characters and interactive activities, novelty and variation are key to sustaining student motivation. Teachers who interviewed explicitly stated that monotonous and repetitive activities quickly led to student boredom, making the learning experience feel mechanical and defeating the primary purpose of using motion graphics. Therefore, strategically introducing variation and novelty at these levels is a necessary means to maintain students’ interest in learning.

Summary

This research proposes an integrated, dual-dimension regulatory model to help designers understand and strategically leverage the core paradox of motion graphics in education. When designing, designers need to make decisions across two dimensions simultaneously:

> **The timing (macro-regulation)**: based on the current phase of teaching, determine whether the primary design goal is to ensure cognitive efficiency or to stimulate learning motivation.
> **The design (micro-regulation)**: after establishing the macro-level goal, determine whether to apply a strategy emphasising **familiarity** or one emphasising **novelty**, according to the design (i.e., functional/behavioural vs. emotional/visceral/reflective).

This model rejects a simplistic 'simple vs. engaging' dichotomy. Instead, it offers designers a more nuanced and dynamic framework aimed at achieving a synergistic balance between cognitive efficiency and learning motivation.

9.3.2 Representational matching and cultural appropriateness: constructing effective instructional visual expression

A fundamental challenge in language teaching stems from the tension between the **abstract nature** of linguistic symbols and the **concrete nature** of learners' cognitive experiences.[2] This perspective is deeply rooted in cognitive and educational psychology, particularly in Bruner (1974)'s theory, which emphasises that learners require effective scaffolding to achieve the cognitive leap from reliance on concrete images (iconic representations) to mastery of abstract symbols (symbolic representations). Therefore, how to design teaching tools that effectively build this bridge from abstract symbols to concrete contexts becomes one of the core issues that this research focuses on.

To this challenge, this research proposes that when motion graphics are used as a teaching tool, designers should address two layers of consideration: first, the choice of **Representational Mode**, which involves strategically switching between 'abstract' and 'concrete' modes; and second, the selection

2 This challenge draws on three theoretical perspectives: VYGOTSKY, L. 1934. (1962). Thought and language (E. Hanfmann & G. Vakar, Trans.). Cambridge, MA: MIT Press., emphasized the developmental tension between abstract, language-mediated scientific concepts and concrete everyday concepts; BRUNER, J. S. 1974. Toward a theory of instruction, Harvard university press., highlighted the instructional transition from enactive and iconic representations to symbolic forms; and GEE, J. P. 2012. Situated language and learning: A critique of traditional schooling, routledge., argued that linguistic meaning is situated in embodied social practice. Together, these perspectives support understanding the tension between abstract symbols and learners' concrete experiences in language teaching.

of **Contextual Content**, which involves ensuring that the presented context is comprehensible and relevant to the learner. This discussion shall first propose a 'representational mode matching' model designed to address formal considerations and subsequently demonstrate that this model can function effectively when constrained by 'cultural appropriateness' at the content level.

This research draws upon semiotic theory (Peirce, 1998) to propose a **'Representational Mode-Matching' model**. The core principle of this model is: **effective instructional design requires matching the representational mode of the visual medium to the cognitive demands of the specific learning task**.[3] In this research, graphics and photographs represent two key modes of representation:

> **Symbolic mode (graphics)**: as a symbolic representation, the core cognitive function of a graphic is abstraction. By stripping away irrelevant details to highlight a concept's core features, it helps students build a foundational and generalizable understanding of vocabulary.
>
> **Indexical mode (photographs)**: as an indexical representation, a photograph has a direct physical connection to the real world (Peirce, 1998). Its core cognitive function is contextualization. By conveying authenticity, it helps students connect abstract linguistic concepts with real-life experiences.

Based on this, the model delineates two key cognitive pathways to guide the strategic switching between modes:

> **From indexical mode to symbolic mode**: this pathway is suitable for introducing concrete nouns with direct real-world referents (e.g., an animal, an object, a place). The strategy is to first establish a firm, authentic referent through a photograph, and then use a graphic for abstraction to help students grasp the concept's essential features.
>
> **From symbolic mode to indexical mode**: this pathway is more effective for teaching functional, procedural, or social concepts (e.g., an action, a command, a dialogue). The strategy is first to present a clear behavioural

3 MAYER, R. E. 2002. Multimedia learning. Psychology of learning and motivation. Elsevier., highlights how graphics and pictures serve different cognitive functions depending on task demands; SCHNOTZ, W. & BANNERT, M. 2003. Construction and interference in learning from multiple representation. Learning and instruction, 13, 141-156., show that learning from multiple representations requires careful alignment to avoid interference; AINSWORTH, S. 2006. DeFT: A conceptual framework for considering learning with multiple representations. Ibid.16, 183-198., emphasizes designing representational modes to match the cognitive requirements of specific tasks.

script or rule using a simple graphic, and then situate it within a complex, real-world context via a photograph to promote knowledge application and transfer.

However, mere formal matching proves insufficient. This research reveals that even when representational forms are correctly selected, should the contextual content they convey conflict with students' cultural backgrounds, it will increase students' external cognitive load (Sweller, 2011), due to unfamiliarity, thereby diminishing teaching effectiveness.

The case of the 'fireplace' in this research serves as compelling evidence (topic 2). The root of the issue lies not in whether the fireplace is presented as a graphic (symbolic mode) or a photograph (indexical mode), but in the contextual element of the 'fireplace' itself. For students from chosen regions lacking relevant life experience, it constitutes an **ineffective cultural signifier**. Far from evoking the cultural associations of a 'warm, cozy home' as intended, but its unfamiliarity may have also acted as a cognitive distraction.

This finding aligns with sociocultural theories of learning, which posit that meaningful knowledge construction is mediated by a learner's cultural tools and social context (Vygotsky, 1978). Therefore, '**cultural appropriateness**' constitutes the fundamental constraint upon which the successful application of the 'representational mode-matching' model depends. Regardless of the mode employed, content selection must be centred upon the students' experiential world:

> When using the **indexical mode** (photographs) to display authentic situations, designers must verify that the scenario, objects, and behaviours are familiar and understandable to the students.

> When using the **symbolic mode** (graphics) to construct abstract scenarios, the depicted scenario must also align with the students' cultural prototypes for that concept, rather than the designer's own cultural assumptions.

Summary

This discussion argues that the design of an effective instructional motion graphic requires synergistic decision-making across two dimensions: 'mode matching' and 'content relevance':

Visual expression, designers should use the 'representational mode-matching' model to strategically switch between abstraction (symbolic mode) and concreteness (indexical mode) according to pedagogical goals, thereby guiding the student's cognitive pathway.

Content presentation, designers should ensure that all design properties, regardless of their representational mode, are relevant to the students' cultural and lived experiences. This guarantees the context's validity and comprehensibility, preventing the introduction of unnecessary cognitive load.

9.3.3 The cueing construction: a cross-media visual grammar for reducing cognitive load

An accepted tenet in motion graphics is that they must convey information clearly and unambiguously. This is often framed as an on-screen design challenge, guided by principles like Mayer (2002)'s Signalling Principle, which advocates using cues to direct learners' attention to salient information.

However, according to classroom tests, this research argues for a more expansive understanding of design for clarity. The core argument is that the structural role of an effective instructional motion graphic is not merely to present information clearly on a single page, but to construct a stable, predictable '**visual grammar**' that functions seamlessly across the entire learning process. The core function of this grammar is to systematically reduce the external cognitive load (Sweller, 2011) that learners experience while navigating the learning process. Within the motion graphic interface, the visual grammar is a direct application and extension of the Signalling Principle. The goal is to build a consistent system of visual cues that guides attention and minimises interpretive effort. Key methods identified in this research include:

Establishing information priority through typography: systematically applying visual hierarchy, using contrasts in text size and spatial position, to signal the relative importance of on-screen information.

Delineating figure-ground through colour contrast: strong colour contrast is found to be crucial for creating a clear figure-ground distinction.

This establishes an intuitive ‘reading path’, guiding the students’ focus directly to core instructional content.

Automating function recognition through consistent designs: when a uniform visual cue is consistently used to signify a specific function, it evolves from a symbol requiring interpretation into a signal that triggers automatic recognition. This directly achieves the teachers’ goal of ‘reducing explanation time’, thus enhancing instructional efficiency.

The original contribution of this research lies in revealing that this visual grammar must transcend the boundaries of digital to maintain its continuity within broader learning environments.[4] This cross-media dimension represents a crucial aspect of Mayer (2002)’s Coherence Principle, which aims to minimise cognitive processing caused by irrelevant information yet is often overlooked in generic design guidelines focused solely on screen-based interfaces. The research identifies two key domains of cross-media coherence:

Coherence with the physical environment: the perceived clarity of a motion graphic is directly impacted by its physical context. The ‘green background’ case (topic 9) from this research revealed that strong contrast colours chosen for screen-only viewing became visually jarring and ineffective when projected in a brightly lit classroom. This demonstrates that the physical classroom must be treated as an extension of the design canvas. Motion graphics design should not focus solely on ‘on-screen’ design but must also consider how the overall presentation environment impacts its design.

Coherence with other learning materials: for students, learning is a unified experience that spans different media (screens, textbooks, worksheets). A fracture in the visual grammar between these media introduces unnecessary cognitive load. Teachers in this study emphasised the need to use illustrations and fonts in the motion graphics that matched those in the physical textbooks. This common practice is hereby given a theoretical explanation: it builds a crucial visual bridge between digital and traditional materials. This cross-media consistency prevents the

4 MAYER, R. E. 2002. Multimedia learning. Psychology of learning and motivation. Elsevier., regarding the coherence principle, which this research extends to mitigate extraneous load caused by stylistic gaps between different media; KIRSCHNER, P., SWELLER, J. & CLARK, R. E. 2006. Why unguided learning does not work: An analysis of the failure of discovery learning, problem-based learning, experiential learning and inquiry-based learning. Educational psychologist, 41, 75-86., on the necessity of accounting for the whole instructional context to ensure that physical environments do not undermine learning guidance.

cognitive confusion caused by shifting visual styles and reinforces the understanding that the content on the screen, and the content in the book are part of the same lesson.

Summary

This study expands the principle of ‘clarity’ in instructional motion graphics from a static, on-screen issue of information design to a dynamic, cross-media, structural issue concerning the fluency of the entire learning experience. The proposed concept of a ‘visual grammar’ directs the designer’s goal beyond merely creating a clear interface, toward establishing a clear, predictable, and coherent learning path. By meticulously constructing a stable system of visual cues at both the micro (on-screen) and macro (cross-media) levels, designers can significantly reduce the extraneous cognitive load inherent in navigating the complexities of learning.

9.4 Synthesis: summary

This chapter demonstrates how the research systematically responds to its core research questions through the various findings. It delves into the dialectical relationships revealed within the multi-dimensional frameworks. By analysing the findings from the theoretical discussion, teacher feedback and prototype testing, the design insights and practical challenges of motion graphics in English language teaching and learning are revealed, and more precise design strategies and considerations are ultimately extracted.

Chapter 10 | Design guidelines

The following presents the final design guidelines. The complete guidelines are presented in booklet format (only the core content is displayed in this chapter; please refer to the appendix for the full guidelines):

Chapter: 1

CORE STRATEGIC PRINCIPLES

In this part, we first establish a macro-level design mindset. These principles are the cornerstones of all specific design decisions, intended to help you think from the strategic level of "why we do it."

Topic 1

Matching the Rhythm of Teaching: **DYNAMICALLY REGULATING COGNITIVE EFFICIENCY AND LEARNING MOTIVATION**

Core Strategy

Design must serve and dynamically match the flow of classroom teaching. The core lies in finding a dynamic balance between two seemingly contradictory goals: "cognitive efficiency" and "learning motivation."

"The Core Paradox of Design"

Cognitive Efficiency

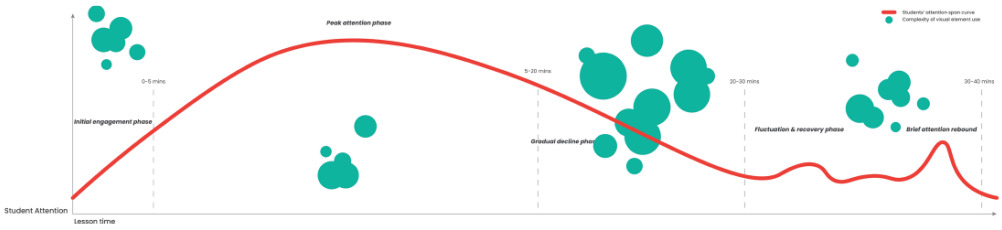
Minimizing the learner's unnecessary extraneous cognitive load. It requires the design to be simple, consistent, and predictable to reduce the burden of information processing.

Learning Motivation

Arousing and sustaining students' situational interest and persistent effort. It relies on novelty, engagement, and diverse elements to attract and maintain attention.

Dynamic Regulation Model

An excellent design does not choose one over the other. Instead, it strategically focuses on one goal depending on the teaching stage to achieve a synergistic effect. Our designs should not fall into the dilemma of being "too repetitive and thus boring" or "too novel and thus distracting."



The relationship between changes in students' attention and the complexity of visual element usage

Stage 1

Lesson Introduction (0-5 mins)

TRIGGERING AND GUIDING

Strategy

Trigger involuntary attention

Quickly capture students' attention at the beginning of the lesson to guide them into a learning state.

Design Methods & Application

Effective attentional anchor
Use video clips or animations as the opening section. Videos stimulate students' interest through continuous images and motion.

Visual design strategies for attracting attention

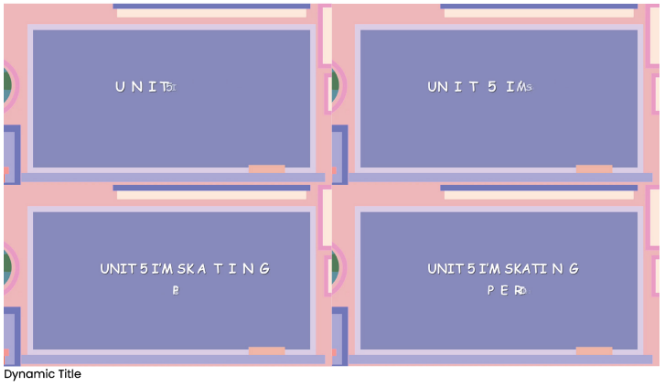
Strong contrast between stimuli
Size contrast (e.g., large vs. small objects) enhances visual impact.

Stimulus intensity
Images and graphics are more effective than text. Color contrast is more visually appealing than text features (e.g., font style).

Novelty and uniqueness
Novel or unfamiliar visual elements trigger students' curiosity. Repetitive content or format reduces interest.



Static Title


Dynamic Title

Simple suggestion:
Add simple motion effects to static titles.

Why

Young students' self-regulation abilities are still developing, making their attention more easily captured by external stimuli, this is "involuntary attention".

Among all visual elements, **moving objects** have the highest priority in capturing the human visual system.

What to avoid

Note: While novelty stimulates curiosity, overly unfamiliar content may be hard to understand and cause cognitive load. Design should balance capturing attention with avoiding cognitive overload.

Stage 2

New Content Preparation (5-20 mins)

CLEAR EXPRESSION, TRANSFORMATION TO VOLUNTARY ATTENTION

Strategy

Clearly present objectives to shift to voluntary attention

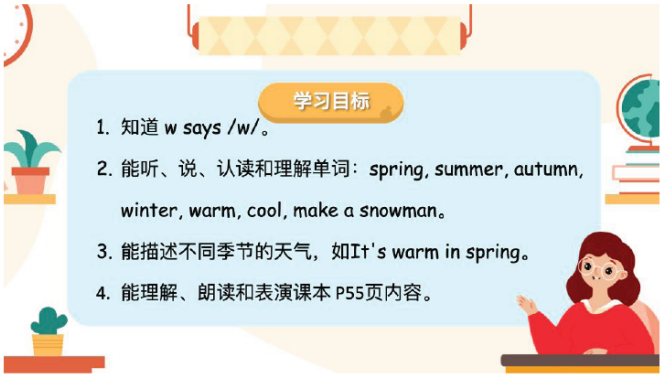
Clearly presenting learning objectives helps students build expectations of learning outcomes and motivates them to complete tasks, supporting the development of voluntary attention.

Design Methods & Application

To ensure clear communication, present information concisely and logically, avoiding redundant or irrelevant visual elements.

Combine the on-screen text with a simple, relevant graphic, and ensure the teacher verbally articulates the objective.

Avoid distraction
Over-decoration or off-topic graphics may distract students, reducing their focus and cognitive efficiency.



Simple suggestion:
State learning objectives in a list format.

Why

After initially capturing students' involuntary attention, it is crucial to transition it to "voluntary attention", which requires conscious effort.

Clearly stating the "what" and "why" of the lesson provides students with a purpose, which is a key factor in developing and sustaining this more focused, self-directed form of attention.

Stage 3

New Content Preparation (5-20 mins)

VISUAL ACCURACY TO SUPPORT INTERACTION

Strategy

Use accurate visuals and appropriate motion to support initial interactive activities

Activate students' prior knowledge or life experiences, often through interactive activities, to maintain voluntary attention.

Design Methods & Application

Graphic content should closely align with interactive activities to enhance teaching effectiveness and logical coherence.

Visual design must ensure visual accuracy and cognitive compatibility
Visual elements must match students' cognitive experiences to avoid misunderstanding.

For example, a "bus" should look like the kind of bus students see in their city.

Motion effects should serve clear teaching purposes; avoid applying motion to purely decorative elements.

The speed of motion effects
The speed should match students' reading and response pace. For lower-grade students, motion speed should be slower. Effects that are too fast may prevent effective review. A single motion effect lasting ***3–5 seconds*** better fits lower-grade students' information processing pace.

Highlight suggestion:
Single motion effect lasting 3–5 seconds



Why

Activating prior knowledge is more effective when the visuals are cognitively compatible.

An inaccurate or unfamiliar visual representation (e.g., a bus that looks nothing like the local buses) creates cognitive dissonance, forcing students to spend effort reconciling the image with their existing knowledge, which increases cognitive load.

Stage 4

New Content Instruction (5-20 mins)

SIMPLIFYING EXPRESSION TO FOCUS ON CONTENT

Strategy

Reduce florid expressions for new content instruction

Simplify motion graphics during the presentation of new knowledge to ensure the content itself is the sole focus.

Design Methods & Application

Employ minimalist layouts with high contrast and clear typography.

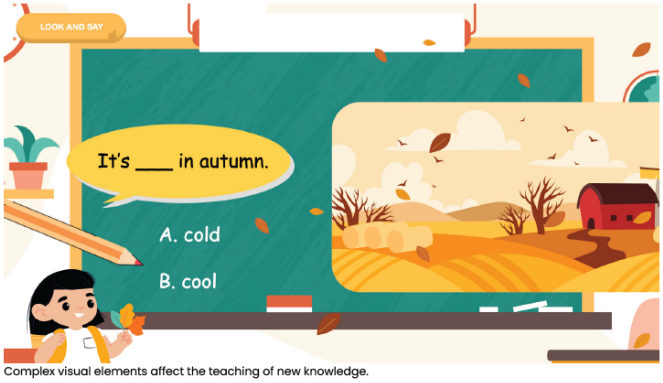
The visual design should be receded, ensuring that the new content is the most salient element on the screen.

Use "stillness" as a tool. After a motion sequence, allow for moments of visual calm for information processing.

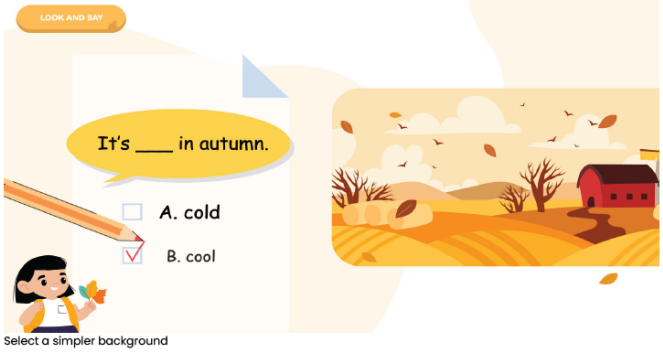
Set critical motion effects to trigger "On-Click" rather than automatically, giving the teacher control.

Static visual elements
A white background is recommended as it improves readability and creates strong contrast.

Motion effects
Limit effects to foundational types like "Appear," "Fade," or subtle positional shifts. Avoid complex or decorative motion.



Complex visual elements affect the teaching of new knowledge.



Select a simpler background

Simple suggestion:
Simplify the entire visual presentation during the new knowledge teaching phase.

Why

This is the peak attention phase for new content instruction. Students' "brain's RAM" is fully engaged in processing new information (intrinsic cognitive load).

According to **Cognitive Load Theory**, any flashy visual elements unrelated to the core content act like extra background programs, consuming valuable "RAM" (imposing extraneous cognitive load) and causing the main task (learning) to slow down or even freeze.

Stage 5

Practice and Interaction (20-30 mins)

ENHANCING INTERACTION TO MAINTAIN ATTENTION

Strategy

Support interactive activities to enhance voluntary attention

During the phase when students' attention naturally declines, use diverse, highly engaging interactive activities to sustain and reinforce their voluntary attention.

Design Methods & Application

Direct interest guidance
Use popular cartoon characters or familiar real-life contexts.
Note: characters should play a supporting role.

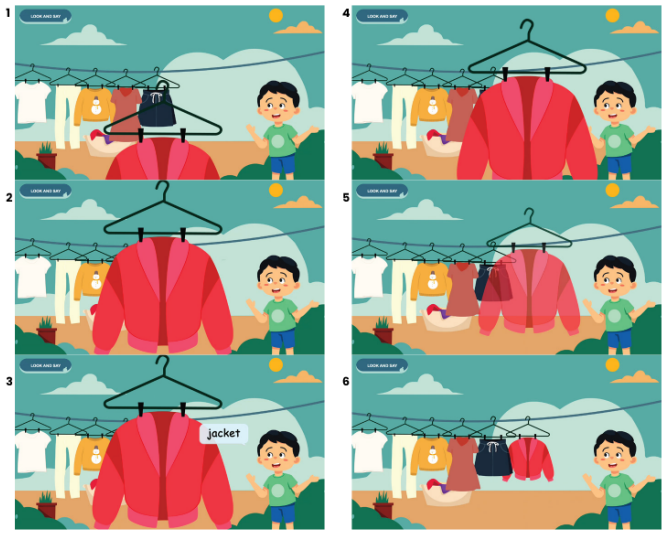
Indirect interest guidance
Integrate gamified elements such as competitions or points collection.

Interactive design
Select a limited number of 2-3 interaction forms per lesson, but vary their visual themes across different lessons to prevent monotony.

Provide immediate and unambiguous action feedback (e.g., a sparkle on a correct match).

Structure tasks to allow for voluntary control of motion effects, such as clicking a button to reveal an answer. Encourage students to physically interact with the smartboard.

Game design
Games are highly recommended for this stage. Their pace can be relatively fast to liven up the classroom.



Motion effects respond to student behaviour (1-6): When clothing appears, students identify the clothing item. After the student speaks the name, a motion effect appears: "The clothing is hung on a rope."

Why

Students' attention spans naturally begin to decline after 20 minutes. At this point, the teaching focus shifts from "imparting new knowledge" to "maintaining engagement."

We need to combat fatigue by stimulating students' "interest," which comes in two forms:

Direct interest: Interest in the activity itself (e.g., favorite cartoon characters, fun games).

Indirect interest: Interest in the outcome of the activity (e.g., winning a competition, receiving praise from the teacher).

Effective interactive activities "reignite" students' motivation to learn by tapping into these two types of interest.

Stage 6

Output and Assessment (30-40 mins)

ALTERNATING FLEXIBLY FOR CONSOLIDATION AND RECOVERY

Strategy

Maintain two facets of attention

In the final phase of the lesson, when students' attention fluctuates, flexibly alternate between strategies of task guidance (voluntary attention) and sensory stimulation (involuntary attention) to support output and assessment.

Design Methods & Application

Motion graphics serve as tools for task guidance and attention elicitation.

Visual design should be more varied and flexible, task-oriented rather than decorative.

Interactive design should be varied and engaging to attract student participation.

Video clips or animations can be reused to re-engage students' attention (e.g., reviewing knowledge in a "Let's Watch Together" stage).
Recommended video length is at least **20 seconds** to help sustain attention.

Why

Towards the end of the lesson, students' "voluntary attention" resources are largely depleted.

However, a brief "attention rebound" often occurs just before the class ends. At this time, experienced teachers alternate strategies: they recapture involuntary attention with novel interactions or videos, and quickly guide this attention back to the task of consolidating knowledge, achieving an effective re-engagement.

Topic 2

Building a Learning Ecosystem:
CROSS-MEDIA VISUAL CONSISTENCY

Core Strategy

Ensure the visual language of the motion graphics is consistent with the physical textbook.

"Building a Cross-Media "Visual Grammar"

Students' learning is a unified experience that spans various media (screens, books, worksheets). When these media "speak the same visual language," it effectively reduces the cognitive confusion caused by shifting styles.

Coherence Principle

Consistent visual elements (characters, fonts, icons) build a crucial visual bridge between media. They convey an important message to students: "The content on the screen and the content in the book are part of the same lesson," thereby systematically reducing extraneous cognitive load.

Examples & Application

Character consistency, element extraction, innovation with inheritance.



Hardcover textbook



Motion graphics

Simple suggestion:
The illustrations provided in the textbook can be used directly to enhance visual consistency.

What to avoid

Designing a visual system that is completely detached from the textbook.

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Topic 3

Situated Learning:
REPRESENTATIONAL MATCHING AND CULTURAL APPROPRIATENESS

Core Strategy

Construct specific, coherent simulated scenarios that are relevant to students' real-life experiences.

How to make abstract words "come alive"?

Situated Learning

Knowledge is better understood and mastered when it is closely linked to the context in which it is applied. An isolated word is an abstract symbol, but placing it in a specific life scene (e.g., learning "apple" in a "supermarket") should enhances its meaning and usability.

Cultural Appropriateness

Even if a scene is beautifully designed, its effectiveness diminishes if its content conflicts with students' life experiences. The unfamiliarity itself creates a cognitive distraction. An effective context should be one that students can understand and resonate with.

Examples & Application

Contextual coherence, authenticity, and localization.



A more comprehensive scenario presentation



Abstract, unrealistic scenario presentation

What to avoid

Providing incomplete contexts or scenes that are disconnected from students' lives.

Chapter: 2

SPECIFIC DESIGN DOMAIN GUIDELINES

In this part, we delve into the guiding principles for specific design elements. Each principle follows the

Strategy + Principle + Example

structure to ensure its actionability and interpretability.

Topic 4

Motion Effects Design:
PURPOSE AND CONTROL

Core Strategy

Motion effects must serve a teaching purpose, not be purely decorative; their speed must match the students' cognitive pace.

Why

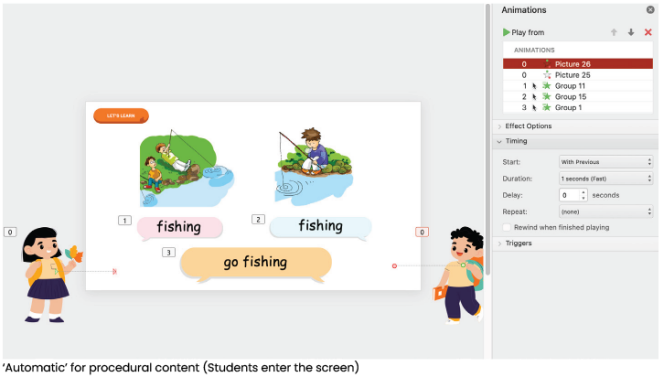
Unnecessary motion effects distract attention, whereas designed effects should guide the eye, explain processes, and provide feedback.

Students process information more slowly, and effects that are too fast can prevent them from seeing and understanding, leading to frustration.

Suggested application

Use cases for motion
Highlighting key content, showing processes, providing feedback.

Trigger controls
Use "Automatic" for procedural content and "On-Click" for key instructional moments.



'Automatic' for procedural content (Students enter the screen)



'On-Click' for key instructional moments (when the dialogue box containing the word appears)

What to avoid

Animating purely decorative elements; setting all effects to play automatically

Topic 5

Visual Expression :
GRAPHICS, PHOTOS, AND INTUITIVENESS

Core Strategy

Use graphics primarily and photos supplementarily, switching strategically to ensure all visual expressions are clear, intuitive, and accurate.

Intuitiveness Principle

Students rely on intuitive thinking.

Visual design needs to convey information directly and clearly. Complex visual metaphors increase the difficulty of understanding.

Intuitiveness requirements
Ensure clear correspondence and avoid ambiguity

Representational Mode-Matching" Model

Graphics (Abstraction)
Suitable for actions and abstract concepts. They help students grasp the core features of something by simplifying details.

Photos (Contextualization)
Suitable for concrete objects and real scenes. They help students connect knowledge with real life through a direct link to the real world.

'To graphic' or 'To Photograph'?

What to avoid

Disrupting cognitive continuity by overusing photos; using blurry or inaccurate images.

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Suggested strategy

(1) Establish a real reference with a photo, then use a graphic for abstraction.



(2) Explain a rule with a graphic, then show its real-world application with a photo.



Topic 6

Text Design :
READABILITY AND CONSISTENCY

Core Strategy

Ensure text is clearly readable from anywhere in the classroom and systematically establish information priority through typography.

The "Signalling Principle" in Visual Grammar

Text design is not just about aesthetics; it is core to building a clear "reading path." By systematically applying contrasts in font size, colour, and spatial position, we send clear signals to students about "what is important" and "what to read first".

This guides their attention and reduces the cognitive resources wasted on searching for information.

Suggested application

Text Color
Use black on white backgrounds; use red for highlighting.

Font Selection
Prioritize fonts that match the textbook.

Text Size

Main body text: 32pt

Minimum size: 24pt

Suggested sizes for functional text:

Course title 36pt

Unit or

Chapter title 40pt

Section labels (for teachers only, who is close to the screen) 12pt

What to avoid
Using green text on screens; using inconsistent fonts

Topic 7

Colour Usage:
APPEAL AND CLARITY

Core Strategy

Use bright, highly saturated colours to attract students while maintaining a clear visual hierarchy through colour contrast.

Cross-Media Visual Grammar

'Coordination with the Physical Environment'

The perceived clarity of on-screen colours is directly affected by the physical environment.

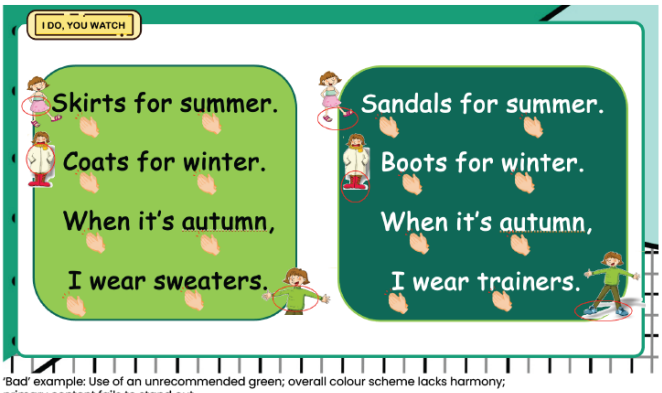
For example, in a brightly lit classroom, some colours that appear high-contrast on a monitor (like a green background) may become blurry and harsh when projected.

Therefore, colour selection must not only consider "on-screen design" but also treat the physical classroom as an extension of the design canvas to ensure the clarity and comfort of the final projected image.

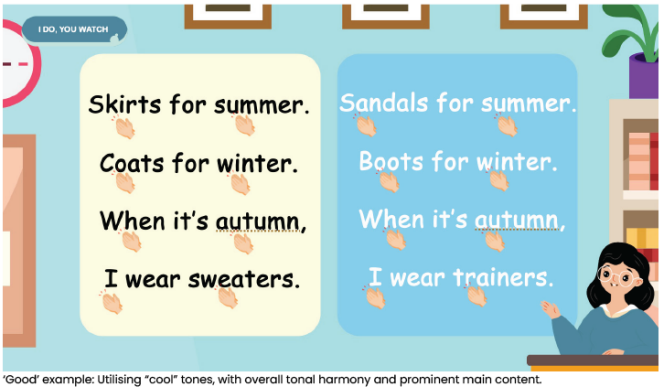
Suggested application

Colour preference
Lean towards high-saturation, high-value colours; cool tones (e.g., blues) are recommended.

Visual hierarchy
Use contrast to make key content stand out.



'Bad' example: Use of an unrecommended green; overall colour scheme lacks harmony; primary content fails to stand out.



'Good' example: Utilising "cool" tones, with overall tonal harmony and prominent main content.

What to avoid

Large areas of pure red;
greenish tones that blend with blackboards;
using similar colours for different information.

Topic 8

Sound Design:
IMMERSION AND SUPPORT

Core Strategy

Strategically use sound to enhance immersion, support pronunciation input, and provide interactive feedback.

Why

The combination of auditory and visual input significantly enhances memory and comprehension. Personified voices (especially children's voices) increase emotional connection, while context-matching sound effects improve realism and engagement.

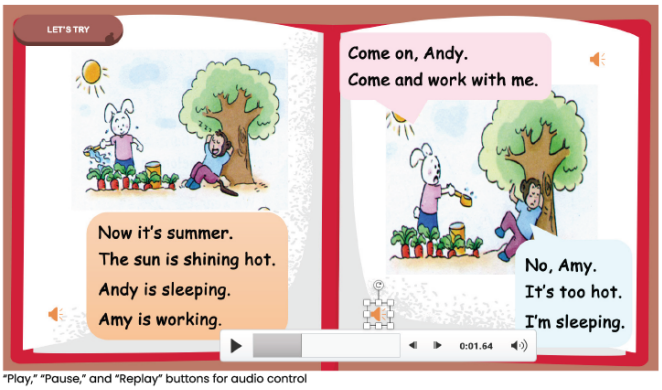
Suggested application

Voice-overs
Use real human voices (especially children's) for pronunciation.

Contextual sound effects
Add matching sound effects (e.g., "drip" for rain).

Interactive sounds
Add short sound cues for key actions in games.

Audio controls
Must provide "Play," "Pause," and "Replay" buttons.



"Play," "Pause," and "Replay" buttons for audio control

What to avoid
Unclear computer-generated voices; sound that cannot be controlled by the teacher.

Topic 9

Familiarity and Novelty:
BALANCING COGNITIVE LOAD AND LEARNING INTEREST

Core Strategy

Combine novel teaching content with familiar interactive formats, or pair novel interactive formats with mastered content, to dynamically balance students' cognitive load and learning interest.

'Stability for Function, Novelty for Content.'

Differentiated Familiarity Strategy

Leverage "Familiarity" for efficiency
For functional, operational design elements (like buttons and icons), high consistency and repetition are crucial. This allows students to develop "muscle memory," enabling them to operate without thinking and thus saving cognitive resources.

Leverage "Novelty" for motivation
For content-based, experiential design elements (like storylines and game mechanics), variation and novelty are key to maintaining student interest. Monotony quickly leads to boredom.

New Knowledge + Familiar Game

Mastered Knowledge + Novel Game

New Knowledge + Novel Game

What to avoid
Introducing a new knowledge point and a new game mechanic at the same time.

Chapter: 3

DELIVERY AND COLLABORATION

Topic 10

Designing for Teachers:
ENSURING FLEXIBILITY AND MODIFIABILITY

Core Strategy

Reserve "modifiable and operable space" during design and provide clear, concise modification instructions to empower teachers to make adjustments based on actual classroom situations.

Why

Teachers are the final implementers of instruction; they know their students' needs best. However, they are not design experts, and complex design tools can be a barrier. A design that cannot be easily adjusted by a teacher has diminished practical value.

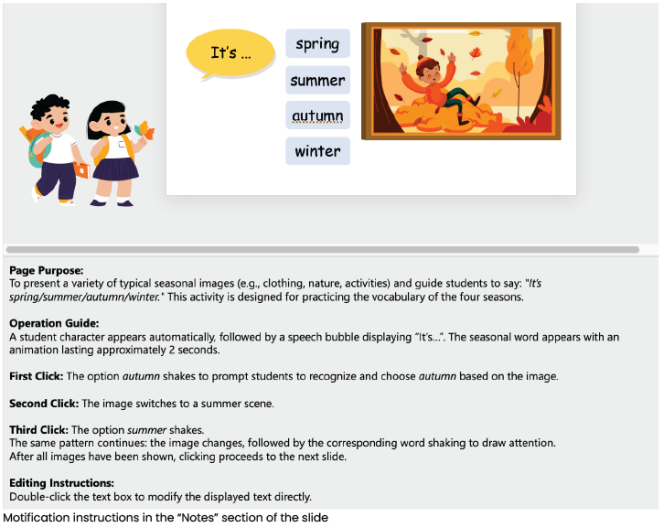
Therefore, providing simple modification guides and flexible design templates is not an added service but a core requirement to ensure the design can "survive" and achieve its better potential in a real classroom.

Suggested application

Modifiable space
Make elements like text boxes and images easy to replace.

Clear annotations
Embed specific instructions in the "Notes" section of the slide.

Simplified operations
Use non-technical language in instructions.



Motification instructions in the "Notes" section of the slide

What to avoid

Locking all elements; providing overly complex modification instructions.

Chapter 11 | Conclusion

11.1 Introduction

Chapter 11 serves as the conclusion of this thesis. The content is structured as follows: Section 11.2 revisits the research objectives, clearly describes how the full research process has addressed them. Section 11.3 presents the original contributions this research has made to the related field. Section 11.4 discusses the limitations of the research, while Section 11.5 outlines potential directions for future research. Finally, Section 11.6 provides the overall closing summary.

11.2 Revisiting the research objectives

To articulate how the overall research process and outcomes address the research objects, emphasise this in Chapter 1, Section 1.6, and now revisit each research object and explain how the research has fulfilled it.

> From Research Question 1:
> To identify the specific definition of motion graphics in this research by combining the academic definitions/concepts with the teacher's understanding.

This research narrows down from a broad to a specific scope to arrive at an operational definition of motion graphics that is tailored to the research context and offers clear, actionable guidance. This process ensures that the research focus is precisely aligned with real teaching practice rather than remaining at a broad theoretical level, thereby adhering to the study's pragmatic philosophical foundation. Through a literature review (Chapter 2), a broad theoretical framework is established and then situated within the core context of this research, the Chinese primary school English vocabulary classroom teaching.

Based on teacher interviews (Section 6.2.1), the definition of motion graphics is narrowed from a broad integration of design to a classroom tool with a clearly defined instructional function. Building on this, the research further incorporates teachers' perspectives to consider the technological platforms through which the instructional functions of motion graphics are realised. It finds that PowerPoint is not only the primary platform for presenting these motion graphics but also the sole tool teachers use for content modification (Section 6.2.3). This leads to a further narrowing of the definition by this critical technological limitation. This yields the following definition of motion graphics' operability: motion visual content, created and presented within the PowerPoint platform, that can be directly modified by teachers and is intended to support primary school English vocabulary teaching. Its design properties (as listed in Section 6.2.2) are constrained by the technical capabilities of PowerPoint, while its pedagogical functions are driven by the actual needs of teachers. It clearly delineates the design scope of this research: the focus is not on motion graphics in general, but specifically on those created within PowerPoint for classroom use, motion graphics that designers can produce and teachers can competently use and modify, with genuine pedagogical value.

From Research Question 2 and 3:
To investigate the interaction between motion graphics and the class participants in the classroom education setting.
To investigate the motivation behind the method/behaviour of teachers using motion graphics in the classroom.
To inquiry subjective design requirements/ideas from the teachers for the motion graphics.
To investigate students' reactions for different motion graphics.

In response to the research objectives derived from Research Questions 2 and 3, this research integrates them into an iterative design investigation and advancement process. Starting from an understanding of teaching practice, in-depth interviews with teachers allow for a detailed depiction of the specific roles and interaction patterns of motion graphics within real classroom teaching setting. Furthermore, the study goes beyond merely describing these 'usage behaviours' by delving deeply into the teachers' motivations behind their practices. Understanding 'why' teachers use motion graphics in certain ways reveals the underlying teaching theories and practical objectives driving their choices. On this basis, the research also focuses on teachers' subjective design

requirements and ideas, as these are the most direct factors influencing the establishment of design guidelines. However, the research does not passively accept every specific design suggestion made by the teachers; rather, it seeks to uncover the implicit instructional needs underlying these explicit expressions. By integrating and analysing the results obtained above, the research encounters fragmented and even contradictory suggestions. Through further discussion and refinement, these are consolidated into a set of preliminary design insights that possess internal coherence and practical applicability. Finally, there is a test for these design insights, placed in a real classroom to get feedback from students. Throughout the iterative testing, student responses, both their engagement and the comparison of student outcomes observed by the teacher, became a criteria for checking whether the design insights can be transformed into guidelines. It is also one of the judgmental factors in whether or not to move forward with the iteration to proceed.

As a result, this study has tried the above iterations to achieve the above research objectives, ensuring that the final outputs are derived from an understanding of teachers' usage and motivation, transformed into professional design insights by translating teachers' subjective needs, and ultimately validated and refined by real classroom responses from students.

> From Research Question 4:
> To construct possible design guidelines and evaluate corresponding design prototypes.
> To establish design guidelines with practical utility.

This research's achievement of the above objectives begins with the iterative research process detailed in Chapters 6 and 7. In each iteration, possible design guidelines (design insights) are actively developed, manifested as prototypes during testing, and subsequently evaluated. The process of restructuring the final motion graphics design guidelines through professional designer validation is demonstrated in Chapter 8. Upon completion of this process, the discussions and specific design guidelines presented in Chapters 9 and 10 realize the establishment of practical and effective design guidelines.

11.3 Contributions

11.3.1 Refining educational theory with cognitive science

The first core contribution of this research lies in its application of cognitive science to refine macro-educational theory for the micro-level context of instructional media design, thereby bridging a critical gap between theory and practice.

Introducing cognitive load as a constraint on experientialism

John Dewey's philosophy of experientialism posits that learning originates from rich, direct experience (Dewey, 1938). If uncritically applied to instructional media design, this philosophy can easily lead to a 'sensory maximisation' fallacy, the erroneous assumption that the most realistic and detailed digital experience is inherently the most effective for learning, resulting in visual presentations with excessive detail and information overload. This research introduces a critical constraint from the micro-cognitive level to this macro-philosophy: Cognitive Load Theory (Sweller, 2011). The research clearly demonstrates that in instructional motion graphics, excessive visual detail transforms into detrimental extraneous cognitive load, thereby impeding learning. The novelty of this finding lies in its challenge to a simplistic understanding of 'digital experience'. It demonstrates that an effective instructional experience is not a mere replication of reality, but rather a deliberately filtered and cognitively optimised guided experience.

Transforming 'discovery learning' into a dynamic regulatory design model

The 'dynamic regulation' model offers a necessary refinement and contextualization of the constructivist concept of 'discovery learning' (Bruner, 1961). While discovery learning emphasises active exploration, its direct application to novice learners (such as primary school students) in foundational knowledge instruction has been severely challenged by Cognitive Load Theory. The repeated emphasis by teachers in this research on clear visual cues and intuitive instructions confirms that unguided or minimally guided approaches can be detrimental for students with limited working memory.

This research's unique contribution is that it moves beyond the binary opposition of 'guided' versus 'discovery' learning to propose a procedural model that dynamically adjusts the level of guidance according to the instructional phase. The research finds that during the core knowledge-construction phase (Phase 4), design should provide strong guidance to ensure cognitive efficiency; conversely, during the knowledge consolidation and motivation-arousal phase (Phase 5), it can afford appropriate openness to encourage exploration. The innovative value of this research, therefore, lies in its transformation of a macro-pedagogical concept into an operational, dynamically shifting design strategy at the micro-interface level. It argues that the degree of guidance is not static but must be strategically modulated based on the learner's immediate cognitive needs.

11.3.2 Reframing design unity from an aesthetic to a cognitive-functional principle

This second core contribution lies in its challenge and re-contextualization of a classic principle in motion graphic design, 'Unity', providing a new theoretical framework for its application in the domain of instruction.

Challenging the aesthetics-centric principle of 'unity'

In the classic guidelines on motion graphic design, such as Krasner (2013)'s, 'unity' is treated as a paramount aesthetic principle. It posits that a work should maintain consistency in visual style, colour, and composition to create a harmonious and coherent aesthetic experience. From this aesthetics-centric perspective, mixing disparate styles like graphics and photographs may be considered a design flaw that violates unity. However, this research argues that this very practice of mixing media is common in contemporary instructional materials. This research uncovers the pedagogical logic behind this contradiction, proposing that in the instructional domain, the guiding principle should not be superficial aesthetic unity, but rather deep cognitive-functional unity. This research argues that strategically and purposefully 'breaking' expressional unity is precisely what is required to achieve a higher-order coherence that serves learning objectives.

Proposing the ‘representational mode-matching’ model

To articulate this new principle, the research introduces the ‘representational mode-matching’ model. The innovative value of this model is its elevation of the choice between graphics and photographs from a purely stylistic decision to a strategic one that serves distinct cognitive functions. The model demonstrates that:

- Graphics correspond to a symbolic mode that serves abstraction.
- Photographs correspond to an indexical mode that serves contextualization.

This implies that when the cognitive demands of a teaching task require a shift from abstraction to contextualization, designers who refuse to switch representational modes in order to maintain superficial stylistic consistency will instead create harmful functional inconsistencies in their designs.

Redefining ‘harmful disruption’

Crucially, this model does not advocate for disorderly stylistic blending. On the contrary, another contribution of this study lies in its more precise distinction between ‘strategic inconsistency’ and ‘harmful confusion’.

- Strategic inconsistency: visual expression switching driven by clear cognitive pathways.
- Harmful confusion: visual expression shifts resulting from a lack of pedagogical logic, merely piecing together materials. As interviewed teachers noted, such frequent and unjustified style alternations compel students to expend extra cognitive resources understanding the changes, thereby increasing external cognitive load (Sweller, 2011).

Therefore, this research does not refute Krasner (2013)’s principle of ‘unity’ but rather deepens it. It confirms that the underlying cognitive psychology of the principle, that chaos increases cognitive load, is valid. However, the key insight is to demonstrate that, in an instructional context, the source of cognitive disruption is not the stylistic shift itself, but the absence of a coherent and comprehensible pedagogical logic driving that shift.

11.3.3 Establishing a strategic connection between educational theory and design practice

The third core contribution is revealed by the validation interviews:

Bringing the theoretical basis of 'why-driven' to design practice

The VERIFICATION INTERVIEW confirms that this research links abstract educational and cognitive theories with practical design, generating design guidelines directly applicable to practitioners. It challenges the field's reliance on individual experience and aesthetic intuition by introducing cognitive load and the principle of familiarity. This provides designers with a theoretical framework explaining 'why' certain designs work, filling knowledge gaps and elevating their work from technical execution ('how') to strategic decision-making ('why'). Consequently, design decisions become more persuasive and educationally effective.

From static products to dynamic learning ecosystems

This research guides designers to shift their unit of analysis from an isolated focus on a single 'product' (e.g., a motion graphic) to a holistic consideration of a more comprehensive, dynamic 'learning ecosystem'. This contribution is evident in this research's explicit assertion that motion graphics design must account for temporal alignment with the flow of teaching. Designers expressed strong agreement with the 'dynamic and layered regulatory model' proposed in this research, acknowledging that without such guidance, their thinking would not have reached such a level of refinement.

Shape research findings into actionable tools that assist designers

This research offers an effective paradigm for the generation of design guidelines, systematising designers' fragmented tacit knowledge while transforming academic knowledge into actionable tools. It emphasises that practical design guidelines must embody the following characteristics: concreteness (case templates), explicitness (clarifying rationale), user-orientation (clear structure), and empowerment (providing frameworks rather than constraints).

11.4 Limitations

The first limitation is that the perspective for collecting data on the use of motion graphics relied predominantly on teachers. This limitation is due to practical constraints and ethical considerations: the participating schools, prioritising student protection, do not permit the researcher to have direct contact with students. Therefore, this research indirectly obtained insights about student learning through teachers' professional teaching experience, feedback from interviews. Although this approach may lack the direct subjective experience of students, the validity and reliability of teachers' descriptions of classroom education, as experienced educators, provide a solid foundation for this research. The findings of this research are cautious in interpreting the states of students' intrinsic motivation, cognitive load, and the clarity of statements are based on the professional inferences of the teachers or the conveyance of the direct statements of the students.

The second limitation comes from the generalizability of the findings. This is due to the sample being selected to focus on a limited number of practising teachers in a specific geographical as well as cultural context. This resulted in this research being able to achieve highly contextualised and in-depth qualitative insights. Although the number of interview participants is limited, from the perspective of qualitative research credibility, the data obtained from the interviews indicate that thematic saturation has been reached. Data analysis shows that by the later stages, new data no longer brought new attributes or dimensions to the core themes, suggesting that the existing sample can support the core findings. Although the findings cannot be easily generalised to all teaching and learning contexts, it has transferability to contexts with similar cultural and educational backgrounds.

The third limitation lies in the inability to precisely control a single variable during testing. The philosophical core of this research emphasises achieving high practical applicability, therefore, it is necessary for the research process and outcomes to maximally reflect and be applicable to the real classroom setting rather than the artificial and experimental setting. As a result, the research necessarily compromises the reliability of inferences about simple linear relationships, i.e., that a single variable leads to a specific outcome. Real classrooms contain numerous uncontrollable confounding variables, and the controllable variables selected in this research cannot be isolated into a single test. Therefore, the findings should be interpreted as evidence of the overall

effectiveness of an intervention in complex, real-world contexts, rather than as a demonstration of a purely linear relationship for a single design variable. This represents an inherent and necessary methodological trade-off in applied, context-specific research.

The fourth limitation concerns the mapping between the proposed design guidelines and their corresponding concrete design instances. While a design guideline can be embodied through multi specific designs, this research is limited by the curriculum plan of a real classroom and is only able to test each guidelines through one or a few design instances, and is not able to implement a test structure that tested the same principle with many different design instances because this would have introduced strong order effects and learning effect, thus increasing uncontrollable variables.

The fifth limitation comes from the accuracy of analysing animation as a design property in motion graphics. The analysis of the current teaching material is one of the most important influences, and animation as a whole constitutes a design property whose internal design cannot be disassembled or manipulated independently, so this does not support providing the teacher with the design space to modify motion graphics by themselves. This research thus analyses its macro-level effects (its role in the teaching process, as present within motion graphics) rather than its individual contribution to more peripheral-level design variables (e.g., the style of illustration within the animation).

The sixth limitation comes from the colour design guidelines. This research focuses more on the presentation of heuristic guidance rather than highly prescriptive design regulations. The current set of guidelines does not explore into the detailed application of colour psychology, cultural colour semiotics, or fully operationalised colour-matching schemes. The challenge for this research is the difficulty of isolating and accurately measuring the complex effects of variables such as colour on learners' emotions and cognition in a real classroom setting.

11.5 Future work

Based on the above limitations, the following future work can be considered.

Integration of student perspectives in the research of instructional interactions. Where possible, the direct perspective of students is introduced to build a more comprehensive framework for understanding the teaching interaction process by collecting subjective feedback from students on their interest in learning, cognitive load and content understanding, which complemented and contrasted with the teacher perspective-based data.

In-depth research of the independent effects of specific design properties. In-depth exploration of the independent effects of specific design variables in a more controlled test setting. This helps to accurately reveal the more specific levels of design decisions that have the most direct causal effect on student learning outcomes.

Improving the cross-contextual generalisability of design guidelines. Applying the design guidelines proposed in this research to different cultural contexts, pedagogical subjects, or age groups of students will help to determine their scope of applicability and explore the adaptations that may be needed in different educational ecologies.

Development and validation of specific colour design systems. The development of a more specific colour design guideline system can be considered, combining colour psychology and cultural semiotics to construct a colour scheme for classroom teaching tools, providing designers with more direct and operational design guideline support.

11.6 Conclusion

This research aims to answer the question: How motion graphics as an educational tool can be designed to support English vocabulary learning for Chinese primary school children in a classroom setting? (Chapter 1). To this end, this research pioneered the linkage between design and education, exploring the dynamic interactions between the four dimensions of design theory and practice, pedagogical theory and practice. The core contribution of this research is the construction of an evidence-rooted, context-driven set of design guidelines for motion graphics in educational usage. Specifically, this set of design guidelines is not a collection of universal recommendations, but is deeply rooted in the specific cultural, pedagogical, and technological context of Chinese primary school classrooms. It translates abstract teaching needs into design strategies that are understandable and actionable for designers. It seeks to empower designers and educational technology developers to create more pedagogically effective motion graphics that truly support the target student learning.

Appendices

INSIGHT INTERVIEWS

Question guides

INTERVIEW QUESTION GUIDES

For Motion graphics as an educational tool that supports learning English vocabulary by Chinese students

In-depth semi-structured interviews in phase 1

Greeting

1. Introduce myself as the interviewer.

2. Explain to the participant about what we are going to do in this interview:

> *"We will be an approximately 1-hour interview that you will be invited to share your teaching experiencer in classroom."*

3. Confirm with the participant that they do understand the information sheet and willing to give his/her consent on this interview.

> *"All the detailed information have been written on the information sheet that I sent you before. Please allow me to emphasize again, the results of this interview will be anonymised, written up and submitted as a part of supporting data in the PhD thesis and may be used in publication. With your consent, the interview will be video-recorded. Once the recording has been transcribed and verified, the video-recording will be destroyed."*

4. Answering any questions form the participant.

> *"Before you sign this consent form, do you have any questions about this interview? If we all clear about the detail, could you please sign on the consent form for me, then we can start our interview."*

INTERVIEW QUESTION GUIDES

For Motion graphics as an educational tool that supports learning English vocabulary by Chinese students

Warm up

- How are you doing today?
- Have you heard about the term "motion graphics"? what have you know?
- What do you think about motion graphics? what motion graphics means to you?
- According to your understanding of motion graphics, what do you consider to be motion graphics in your teaching tools/materials?
- What are the motion graphics means to you when you are using it in teaching? (Main tools/Auxiliary tool etc.)

Teaching behaviour

"Based on the teaching materials you have provided me with, I have been able to gain some insight about your teaching method in the classroom. I would now like to invite you to share your teaching methods in the classroom in general, in the use of teaching material/motion graphics, so that I can have a more comprehensive understanding of your teaching approach and how it relates to the motion graphics."

**Please show us how you usually uses it* (the current teaching material, one unit) *in the classroom and how you teach with it?*

The model of the problem is generally as follows:

- ***Based on the teaching materials you have provided me with, how do you usually teach in the ... session?***
- ***How do you usually use this teaching material in the ... session?***
- ***What would be special about the way this session is taught, in analogy to other sessions?***
- ***When using motion graphics, how do you usually present them?***

Use the model questions above and the classroom notes provided by the teachers to gain an understanding of the teacher's teaching approach

INTERVIEW QUESTION GUIDES

For Motion graphics as an educational tool that supports learning English vocabulary by Chinese students

About the corresponding student response

Teachers use motion graphics in different ways in different sections of the lesson and how do the students respond?

• Based on your statement above about the teaching approach you used in this session, please share with me what kind of response you get from the students when you use this teaching approach?

Examples of student responses

Students respond passively because the teacher asks them questions using motion graphics.

Student-initiated responses

Student-initiated questioning

Students have high interest and motivation in the learning activity with motion graphics, which enhances student involvement in learning tasks.

Motion graphics encourage students to actively participate in learning and be more focused on the tasks, e.g., actively questioning or adding to the teacher's or classmates' comments.

Student's peer cooperation. Students cooperate in tasks. They could support with each other and contribute their own skills, e.g., comment on classmates' presentations, identify mistakes when classmates respond to the content in the motion graphics, and help in finding correct answers.

"Did you notice any special reactions from students other than the above student behaviours and responses?"

"Can you share with me some situations where you think motion graphics are relevant to student learning behaviour?"

"Do you have any inferences about the reasons for this based on the students' reactions or behaviour to motion graphics and the teaching methods you use?"

INTERVIEW QUESTION GUIDES

For Motion graphics as an educational tool that supports learning English vocabulary by Chinese students

Motivation

> *"Based on this approach to teaching, can you share with me the reasons for using teaching materials/motion graphics in this way?."*

Based on the teachers' descriptions of their own teaching methods, I would like to know why they use motion graphics in that way. The general topic would be:

> Why do you use motion graphics to ..... (It depends on different teaching behaviours)
> when you teach in the classroom?

For the specify teaching method, the questions set would be:

> ***• Reviewing in the...section, we can notice that you are using motion graphics to... could you like to share with me why you are using motion graphics in that way?***
>
> For example: reviewing your teaching method with motion graphics, you were asking the student questions about the content of motion graphics?
>
> ***• Do you prefer to do so? Just it related to your teaching style?***
> ***• Any technical reasons you would like to share?***
>
> ***• Do you think this is more helpful comparing to the other ways of teaching and learning?***
> If you do, could you please explain the reasons?
> If you are not sure, could you please share your idea about making this action?
>
> ***• Any teaching experience you would like to share, related to the similar use?***
>
> ***• Do you think that teaching experience/method is successful, or being useful for helping the student to learn?***
>
> ***• Based on your own analysis, can you share with me what you think the reasons are?***

INTERVIEW QUESTION GUIDES

For Motion graphics as an educational tool that supports learning English vocabulary by Chinese students

Evaluating his/her teaching methods

- ***How would you evaluate the lessons we talked about?***

- ***Are you satisfied with the effectiveness of the lessons?***

- ***Is there any part of the lesson that you felt helped the students effectively?***

(Questions can be based on the teacher's classroom record sheet)

- ***Is there any part of the lesson where you thought the students would need more help?***

- ***Is there any teaching method you would like to improve? what you would do differently next time? why?***

- ***What are the core skills/methods that you will like use in vocabulary teaching/classroom education?***

- ***What are the core skills/methods that you will like use related to motion graphics?***

- ***Would you like to share a case you have improved teaching (with the use of motion graphics) and you think that was successful?***
Based on your analysis, what do you think caused it to be a success?

- ***Would you like to share a teaching action you have used to help engage an individual learner or group? (Any action incorporated with motion graphics?)***

- ***Would you like to share a case of when the students refused to cooperate/not respond when you teach in classroom?***

- ***What do you think is the reason?***
What did you do?
How did your actions affect the situation?
What would you differently next time?

- ***If this act of teaching is related to the design of motion graphics: What do you think is the reason?***

INTERVIEW QUESTION GUIDES

For Motion graphics as an educational tool that supports learning English vocabulary by Chinese students

Design needs/ideas

- ***What do you think is the most important requirement in teaching vocabulary in the classroom settings? (Related to the use of motion graphics)***

- ***What are the obstacles you have when you try to use motion graphics for teaching?***
(You can share any concern/difficulty while you are using motion graphics.)

Technical issue (display devices, etc.)
Content issue/your preference: supporting explanation; rhythm/content leading.
Design issue: fragmented engagement; continuous story/content narration, etc.

As for the motion graphics you are using:

- ***What do you not like?***
Technical issue
Content issue
Design issue

- ***What parts of the design you think are useful/effective in supporting your teaching methods? (You'll want to be kept in the new design)***

*The above is the general flow of the interview, the details of which will be modified slightly according to the previous steps.

Ending

"Thank you very much for participating in this interveiw. The information you have provided has been very helpful.

Are there any questions that I can answer before we end the session?

Thank you again for your help. I really appreciate your time and your knowledge."

*The above is the general flow of the interview, the details of which will be modified slightly according to the previous steps.

Final themes, subthemes and codes

Final Theme 1: Pedagogical Roles of Multimedia, Animation, and Interaction
This theme captures how multimedia elements—particularly animation, motion graphics, and interactive games—are perceived and used as instructional strategies to support understanding, engagement, and learning processes.

1.1 Instructional Functions of Animation and Motion Graphics
This sub-theme reflects teachers' conceptual understanding, design intentions, and practical use of motion-based visual elements.
* Benefits and functions of animation
* Motion graphics in PowerPoint
* Automatic moving patterns
* PPT motion effects
* Moving pictures and shapes
* GIFs
* Teacher's definition of motion graphics
* Teacher's motion design requirements
* Teacher's motion graphics knowledge and unfamiliarity
* Teacher's use of animation and motion effects

1.2 Interaction and Game-Based Learning
This sub-theme focuses on interaction as a pedagogical mechanism to promote engagement and participation.
* Definition of strong interaction
* Functions and benefits of interactive games
* Function of the game
* Interactive sessions and frequency
* Interactive methods used by teachers
* Teacher's use of games
* Students' enjoyment of games

1.3 Multimedia Resources Supporting Learning
This sub-theme addresses the use of multimodal resources to enhance comprehension and memory.
* Multimedia resources
* Video clips
* Audio recordings
* Trend charts
* Visual cues
* Visual words

Final Theme 2: Visual Design Strategies and Aesthetic Considerations
This theme concerns visual decision-making in teaching materials, including image types, colour use, and stylistic choices aligned with learners' preferences.

2.1 Image Representation and Visual Styles
This sub-theme captures evaluations and preferences regarding visual forms.
* Benefits and shortcomings of using photographs
* Preference for cartoon styles
* Use of cartoon patterns
* Visual styles
* Teachers' requirements for picture use
* Teacher's use of pictures

2.2 Colour Use and Visual Emphasis
This sub-theme reflects pedagogical and aesthetic considerations related to colour.

* Use of colour in teaching materials
* Teachers' requirements for colours

2.3 Familiar and Contemporary Visual Elements
This sub-theme highlights the use of familiar and popular visual language to enhance engagement.
* Familiar characters
* Characters used in course materials
* Memes and emojis
* Student reactions to familiar content

Final Theme 3: Learner Characteristics, Engagement, and Learning Outcomes
This theme focuses on how students' developmental characteristics shape engagement, attention, and learning effectiveness.

3.1 Learner Characteristics and Cognitive Patterns
This sub-theme addresses age-related and cognitive factors influencing learning.
* Characteristics of Year 2 students
* Students' thinking patterns
* Students' needs

3.2 Classroom Engagement and Behaviour
This sub-theme captures students' observable engagement and attention patterns.
* Keeping students' attention
* Students' attention is easily disturbed
* Student behaviour in the classroom
* Students reporting what they see on PowerPoint
* Students' reactions

3.3 Learning Outcomes, Memory, and Attendance
This sub-theme relates to learning performance, retention, and participation.
* Student learning
* Learning outcomes and memory
* Student outcomes and attendance

Final Theme 4: Instructional Tools and Teaching Practices
This theme addresses how instructional tools—particularly PowerPoint and textbooks—are integrated into classroom teaching and lesson delivery.

4.1 Use of PowerPoint and Textbooks in Instruction
This sub-theme reflects teachers' reliance on and perceptions of instructional tools.
* Benefits of using PowerPoint in class
* PowerPoint as the primary teaching tool
* PowerPoint as a supporting tool
* PowerPoint facilitating understanding
* Students' preference for PowerPoint
* Teachers' preference for PowerPoint
* Teachers' use of PowerPoint
* Use of textbooks and textbook materials
* Combined use of PowerPoint and textbooks
* Distraction caused by simultaneous use

4.2 Lesson Structure and Pedagogical Approaches
This sub-theme focuses on instructional organisation and teaching strategies.
* Lesson planning
* Teaching approach
* Preferred lesson formats
* Using scenarios and stories to teach

* Classroom activity prompts
* Instructions for use
* Process of using teaching tools

Final Theme 5: Teachers' Design Decision-Making, Constraints, and Evaluation
This theme captures teachers' professional reasoning, practical constraints, and evaluative practices related to teaching materials and assessment.

5.1 Teachers' Design Thinking and Professional Experience
This sub-theme reflects teachers' pedagogical beliefs and design practices.
* Teacher's design ideas
* Teacher's material selection methods
* Teachers' sharing of teaching experience
* Teacher feedback on teaching materials

5.2 Constraints and Practices in Revising Teaching Materials
This sub-theme addresses challenges and strategies related to revising PowerPoint materials.
* Difficulty revising materials
* Methods for revising PowerPoint
* Reasons for modifying PowerPoint
* Reasons for not revising PowerPoint
* Teachers' intention to revise materials
* Hardware limitations
* Production of current teaching materials

5.3 Limitations of Current Teaching Materials
This sub-theme focuses on perceived shortcomings and their instructional impact.
* Current teaching materials
* Shortcomings of current materials
* Impact of inappropriate design on lessons
* Shortcomings of animation
* Shortcomings of interaction
* Shortcomings of sound effects

5.4 Assessment and Curriculum Alignment
This sub-theme concerns assessment practices and curriculum requirements.
* Curriculum design
* Learning outcome requirements
* Learning outcomes assessment
* Methods of assessing learning outcomes
* Reasons for current assessment practices
* Methods for comparing old and new materials

Interview transcript

The following are transcripts of the interviews, edited to remove translation errors and extraneous content, presenting the core dialogue:

Interview Transcript Teacher A

Interviewer: Researcher
Interviewee: Teacher A

Researcher:
Hello, Teacher A. To begin, I'd like to ask you a question. As a teacher, when you first see the term "dynamic graphics," what comes to mind?

Teacher A:
For me, and I think for most teachers, seeing the term "dynamic graphics" brings to mind moving pictures, similar to the stickers or GIFs we often use. We sometimes incorporate animated stickers into our courseware to capture students' attention.

Researcher:
In the context of the courseware you currently use, do you feel it includes "dynamic graphics"?

Teacher A:
The courseware we use generally doesn't have built-in dynamic graphics; the images are static. We have to rely on the animation design features in PowerPoint (PowerPoint) to make them "move." For example, in the courseware for first and second graders, if I want to animate a character, I need to use a layering technique. I'll place images of the character in different poses one on top of the other and then use PowerPoint's animation design to play them in sequence. From a child's perspective, they see it as, "Wow, the character is moving, that's amazing!" Then, the teacher adds voice-overs, also using PowerPoint's animation functions, so the sound and animation play together. The students will then exclaim, "Wow, this thing can move and talk!"

Researcher:
So, after you've added these animation designs yourself, would you consider them a type of dynamic graphic?

Teacher A:
Yes, it could be considered a type of dynamic graphic because, visually, it is moving. However, the creation process is very tedious because the animation sequence can easily get messed up. If it goes wrong, it requires constant previewing and revising.

Researcher:
(Shows a pre-made short animated video) And how would you define a complete video like this one?

Teacher A:
In our teaching, we would call this a "video multimedia resource." We would say we are "introducing some video multimedia resources" in the classroom.

Researcher:
I see, thank you. My research actually focuses on both of these aspects: the animated affects you create using PowerPoint functions, and these pre-made animated shorts. I hope to understand your actual teaching methods and needs to optimize the animation design in courseware, making it smoother and visually better.

Teacher A:
That sounds good. For elementary school students, from first to sixth grade, they all enjoy using teaching courseware. This is because courseware provides visual support, making it easier for them to understand what we are talking about. Furthermore, our courseware includes videos, audio, and some supplementary games, which helps to maintain their learning enthusiasm and attention. When your courseware is designed to be interesting, it's much easier to spark students' interest in learning.

Researcher:
I've noticed that in the lower grades (first and second grade), when you use this courseware, is the time spent using physical textbooks relatively less?

Teacher A:
Yes, it's significantly less. For first and second graders, the content in the textbook for a single class period often corresponds to just one page. Our approach is to first use the courseware (PowerPoint) to have the students practice the content until they are very familiar with it—so familiar that when they open their textbook, they can already recognize, "Oh, this is the page the teacher was just talking about." Only then do we guide them to follow the text with their fingers, read along, and recognize the words. After all, they are only in first or second grade and aren't that familiar with English. If we asked them to open their books at the very beginning of the class, they would be completely lost.

My method is to primarily use the PowerPoint for introducing the lesson, starting with vocabulary, then moving to complete expressions, and finally using the short poems or songs from the textbook for practice. After all the drills are done, we then open the textbook. In the classroom, I will point to the TV screen to lead them in reading; they read whatever I point to. If I don't lead them this way, they don't know how to do "finger-pointing reading." After we practice this, we do some exercises in the book, like circling specific sight words. This way, when they go home, they generally know how to practice finger-pointing reading on their own.

Researcher:
How is this different from the higher grades?

Teacher A:
It's different in third and fourth grade. They start to encounter more grammar concepts, and with the foundation in listening and speaking they've built in the first two years, we can have them do more in-depth listening, speaking, or reading exercises after some drills. At that stage, we follow the textbook content much more closely.

Researcher:
So, for first and second graders, their attention is easily diverted, and asking them to switch between the book and the screen would be too much for them to follow.

Teacher A:
Yes, that's why I mainly use the PowerPoint.

Researcher:
(Shows a second-grade PowerPoint courseware) Let's take this courseware as an example. How would you typically use it?

Teacher A:
I would usually make some modifications. Because for different students, some sections might not be suitable, or some parts might be too difficult, so I might simplify them. The main reason is that I need to make adjustments based on the actual situation of the students in my class.

Researcher:
(Plays the warm-up section of the PowerPoint, a game where words and sentences flash quickly) How do you typically use a section like this?

Teacher A:
Many of the vocabulary words in this section were already learned by the students in first grade or the first semester of second grade. So, we use this part as a "pre-class warm-up." Its purpose is to activate the students' prior knowledge. If it moves too fast, I will slow it down. This game-like format is much more interesting for them than simply having them read the words.

Researcher:
Are the vocabulary words reviewed in this warm-up related to the new content of the lesson?

Teacher A:
It's definitely reviewed because it will be useful. We activate this knowledge in advance because it will be used in the new lesson that follows.

Researcher:
What are the students' reactions to this kind of warm-up game?

Teacher A:
They don't just "read along"; they will actively shout out the words they recognize. When they see a moving screen, it's a game to them, and they participate with great enthusiasm. Of course, some students might not know the words, but those who do will definitely shout them out.

Researcher:
So you don't need to say, "Everyone, read with me." As soon as you play it, they join in on their own.

Teacher A:
Yes. If they say something wrong, I'll correct them promptly. If they don't know a word, I'll give them a hint by mouthing it. That's why, as I said, the default speed is too fast. I would slow it down or change it so that the next item only appears when I click.

Researcher:
In this part of the lesson, do you prefer to interact with the students, or do you tend to use it as a tool to energize them while you handle some pre-class preparations?

Teacher A:
I prefer to have some light interaction. This interaction involves promptly correcting students when they make mistakes, or noting common errors to address them more thoroughly later in the lesson. Interaction is essential.

Researcher:
What if the warm-up is singing a song or watching a short animated video?

Teacher A:
It depends on the specific situation. For a vocabulary review game like the one we just saw, interaction is needed to monitor their problems. If it's singing, it's best for the teacher to lead them the whole time; they will be more excited and bold. If it's watching a short-animated video as an introduction, then the teacher shouldn't disturb them. Let them observe on their own. We can have interactions after they finish watching.

Researcher:
How do you go about modifying the courseware you receive?

Teacher A:
Many of us have to teach across multiple grades. For the exam-focused grades like third through sixth, we spend more time modifying their courseware. For first and second grade, we make fewer changes because the animation designs are very numerous and complex. Modifying them is very time-consuming and it's easy to make mistakes. So we usually only make small adjustments, or if we feel a page is unsuitable, we just delete it entirely. The purpose of modification is mainly to match my own teaching pace, or because a certain part is too difficult for my students, I choose to simplify it or remove it.

Researcher:
(Moves to the new lesson section, the PowerPoint shows a scene where a bus arrives at a place resembling an amusement park, with the word "park" labelled) How would you handle the introduction of new information like this?

Teacher A:
Since our previous warm-up game was "riding the bus," this logically connects to "traveling by bus." I would ask the students, "Where have we arrived? What do you see?" They would excitedly tell me. Then I would introduce the new word. However, an image like this one doesn't quite match the word "park." Students might see it and think it's an "amusement park."

Researcher:
If you encounter a situation like this, would you modify it yourself?

Teacher A:
Yes, I would change the picture. If I can find a suitable cartoon image that fits the style, I'll use it. If not, I'll use a real photo, especially one from the students' surroundings. For example, we could use a photo of the ecological park next to our school or a supermarket they often visit. This gets them more excited and helps them realize, "Oh, so this word corresponds to this place in our lives," helping them connect it to their real world.

Researcher:
So for young learners, using pictures to connect with the meaning of words is very important.

Teacher A:
Yes, the easiest way for them to understand a word's meaning is to see a picture of it. Young children are more inclined toward intuitive and visual thinking. They see a picture or an animation, match it with the word, and can clearly understand its meaning. That's why when we teach nouns or very obvious actions, we generally don't need to explain them in Chinese.

Researcher:
(Moves to the practice section, where the PowerPoint shows some matching games) What is the purpose of these activities?

Teacher A:
These exercises serve two purposes. On one hand, they are for reinforcement. By using different formats like “picture with word,” “picture without word,” and “word without picture,” they practice repeatedly, matching the word with the image. On the other hand, this is also a process of observation. During these exercises, you can clearly see which students have mastered the content and which are still struggling.

Researcher:
What do you do when you find that some students are falling behind?

Teacher A:
Later, when teaching pronunciation, I might focus more on that student, making more eye contact with them. Often, young children know what something is but can’t say the word, simply because they don’t remember how to pronounce it. Eye contact, and having them follow your mouth shape to imitate, can help. Of course, at this age, they also forget quickly. They might perform well in one class but forget by the next. That’s why we need to constantly review these vocabulary words in warm-ups or subsequent lessons.

Researcher:
(The PowerPoint shows a reward animation of getting a star) What is the function of this part?

Teacher A:
This is a form of “formative assessment.” When they complete a task, they are rewarded with a star or hear applause. They know they’ve done a great job. It’s a form of encouragement that motivates them to keep learning.

Researcher:
I’ve noticed that the PowerPoint has many slides. Can you finish it all in one class period?

Teacher A:
In a real class, we often can’t finish it all, so we’ll make some cuts, mainly in the extension activities at the end. However, once the students get used to the teacher’s rhythm and the courseware’s patterns, our teaching pace speeds up. For instance, when students see a certain layout, they know this part is for reading along, and the next part is for matching, without needing much explanation from the teacher. In that case, the entire courseware can be completed, provided the final extension activity isn’t too elaborate.

Researcher:
So, if sections with similar functions in the courseware maintained a consistent layout, would that help you and your students build a rapport more quickly?

Teacher A:
Yes, it would. If the layouts are similar, they will gradually learn what to do in that section. They will subconsciously understand the task, which saves a lot of unnecessary instruction time.

Researcher:
(Moves to the sentence-teaching section, where an animation demonstrates “Where are you going? I’m going to the park.”) How do you usually teach this part?

Teacher A:
For longer sentences like this, the PowerPoint comes with a recording. We first let the students listen, then I lead them in reading it, and we say it together. It’s impossible to expect them to be able to read it on their own at this stage. Through repeated exposure in later sections—listening many times, reading many times—gradually, I can just point to the sentence and they can say it themselves.

Researcher:
For words or sentences that are particularly difficult to pronounce, do you require them to master them?

Teacher A:
No. For example, the pronunciation of “Where are you going?” is quite challenging for them. We treat it as a difficult point and practice it repeatedly from first to second grade, but we don’t force every student to master it perfectly in one lesson. Our requirement is that when they hear the teacher say it or see a prompt, they can follow along. We differentiate between key points and non-key points. Some vocabulary we hope they can produce spontaneously, while for others, being able to follow with a prompt is sufficient.

Researcher:
In your teaching experience, what kind of content elicits a special reaction from students, or what are they particularly interested in?

Teacher A:
They get very excited when they see familiar cartoon characters, like Peppa Pig or Disney characters. Also, highly interactive games, especially those where the PowerPoint can give them immediate feedback.

Researcher:
Could you elaborate on what you mean by “immediate feedback from the PowerPoint”?

Teacher A:
For example, we’ve done a basketball shooting game. A word is written on a basketball. If the student reads it correctly, I click, and the basketball in the PowerPoint animation goes into the hoop. The students get really excited when they see that, feeling like, “Wow! I made the shot!” Other games like Whac-A-Mole or bowling are similar. They make the students feel like they are the ones controlling the game. This kind of interactivity is extremely effective at boosting their motivation.

Researcher:
Do these more elaborate games distract them?

Teacher A:
Initially, some students might focus only on “Did I make the shot?” and neglect to read the word. But gradually, as they become more familiar with the game and the vocabulary, they will follow along and read. Overall, this method is very effective for focusing their attention and energizing the classroom atmosphere.

Researcher:
What is the functional difference between playing a game and watching an animation in your teaching?

Teacher A:
Their functions are different. Playing a game allows them to participate in the “practice” stage; it’s a process of “output.” Watching an animation, on the other hand, is more of an “input” of new knowledge. Students watch with great concentration and can remember certain vocabulary that is repeated in the animation. An ideal sequence could be: first, input new knowledge through an animation, and then, use the content from the animation to design a game for students to practice and use it.

Researcher:
From a teacher’s perspective, what aspects of the current courseware design do you think need improvement? And what would you like to keep?

Teacher A:
What to keep:

- The overall teaching flow (introduction - practice - application - game) is very effective and can be kept.
- The interactive game sections are very popular with students and should definitely be kept.

What needs improvement:

1. **Operability and Ease of Modification:** The current courseware is too difficult to modify because the animation settings are overly complex. We hope that after receiving the courseware, we can easily make personalized adjustments, such as changing the animation speed or deleting some steps, to fit the pace of our class and our own teaching habits. The ideal state is for the courseware to have room for customization, and for that customization to be easy.
2. **Removal of Unnecessary Aiding Elements:** For example, the pointing finger icon in the PowerPoint is something I usually delete. It gets in the way of me using my own teaching stick or finger to guide students and interferes with the teacher›s live instruction. The design should take the teacher›s actual in-class actions into account.
3. **Avoidance of Misleading Images:** Like the «park» image mentioned earlier, the choice of images needs to be precise to avoid confusing students.
4. **Teacher’s Guide Information:** Any teaching suggestions or procedural notes for the teacher should be placed in the notes section at the bottom of the PowerPoint or in a separate document,

not displayed directly on the slide during playback.

Researcher:
Do the images in the courseware need to be consistent with the images in the textbook?

Teacher A:
They don't need to be completely consistent. Except for when we are discussing content from a specific page in the textbook, where it's good to use the book's illustrations to show students we are learning from the book, for all other parts, we can use different styles and a wider variety of images. As long as the teaching content aligns with the core knowledge points in the textbook, it's fine. This also gives designers more creative freedom.

Researcher:
Do you ever feel that the courseware content is insufficient?

Teacher A:
Almost never. The content in the courseware now is very rich. We only ever feel like we can't finish it all, not that there isn't enough. The key is how the teacher selects and trims the content based on the actual classroom situation.

Researcher:
One last question, what are the "extension activities" you mentioned typically like?

Teacher A:
An extension activity means adding some new content on top of the existing knowledge. This new content could be something completely new, or it could be an integrated application of previously learned knowledge. For example, after learning several location nouns, the extension activity might involve incorporating weather or cities, allowing students to have a simple conversation. If the new knowledge introduced in the extension is too difficult, we teachers will consider simplifying or modifying it.

Interview Transcript Teacher B

Interviewer: Researcher
Interviewee: Teacher B

Researcher:
Hello, Teacher B. When you hear the term "Motion Graphic," what is your first impression or concept of it?

Teacher B:
My concept is that the graphic might seem to move when viewed from different angles, or it's something like a puzzle or a GIF that changes on its own.

Researcher:
In the teaching PowerPoints you currently use, do you think there are "dynamic graphics"?

Teacher B:
I think so, including some of the GIFs we normally use.

Researcher:
What about effects in PowerPoint, where something is static but animates when you click it during a presentation? Do you consider that a type of dynamic graphic?

Teacher B:
In my understanding, that shouldn't count. Because some words are difficult to understand, we use GIFs to present them. I consider the effect you described in PowerPoint to be static.

Researcher:
(Shows a pre-made short video) What about something like this, which is a finished product like a short video? Do you consider it an animation?

Teacher B:
We would consider that a "video" now.

Researcher:

Actually, the “dynamic graphics” that I research and design encompass all the forms mentioned above. Whether it’s a PowerPoint animation triggered by a click, a self-playing GIF, or a complete animated short like this, they are all included.

Teacher B:
We can’t create complete animated videos like that ourselves. Our textbook comes with a supplementary CD-ROM called “Jin Tai Yang” (Golden Sun), which contains a corresponding video for each text. When the textbook is updated each year, the content in Jin Tai Yang is also updated. It essentially acts out the content of the text.

Researcher:
So “Jin Tai Yang” is more like a resource pack?

Teacher B:
The teacher’s version is like that. We can plug it into a computer and extract materials like images and videos from its folders to use in our own PowerPoints. The student version is more like a software application where they can click to play the text as a video.

Researcher:
When teaching second graders, how do you position the role of PowerPoint? Is it the main teaching tool or a support tool?

Teacher B:
For a vocabulary lesson, I see it as a support tool, primarily to provide the structural framework for the entire class. This is because I have my own little games that are conducted away from the PowerPoint. For example, we practice reading words with different tones and volumes; the students love the game where “if I’m loud, they are soft.” I also use hand gestures, where my hand at the bottom represents the lowest volume, and as it rises, the volume increases, like adjusting the volume on a computer.

Additionally, because students have varying proficiency levels, I use a “train” format where they take turns reading words one by one to ensure everyone participates.

Overall, the PowerPoint is used to display the framework and content, but the teaching process is a combination of the PowerPoint and my own mini-games. A lesson needs to cover listening, speaking, reading, and writing. Listening primarily relies on the audio in the PowerPoint; reading is combined with my games; for writing, I use phonics to guide them in spelling and memorizing words through activities like clapping out syllables, or I use games like fill-in-the-blanks (puzzles) and circling words on worksheets.

Researcher:
You mentioned that the PowerPoint serves as a framework. Does that mean it helps you remember the teaching steps?

Teacher B:
Yes, the PowerPoint presents the structural framework of our lesson. A class is 40 minutes long, and it’s easy to forget the next step. I primarily use the PowerPoint’s framework to remember my teaching sequence. We rarely play games completely detached from the PowerPoint; it’s usually a combination of both. My mini-games supplement the practice sections in the PowerPoint, because you can’t put all the drills on the slides. It’s hard for students to keep their attention focused on the screen the entire time. The PowerPoint acts more as a visual reminder, letting them know, “The teacher is on this word now, and I need to read along.”

Researcher:
Do you find the practice games included in the PowerPoint to be sufficient?

Teacher B:
The practice in the PowerPoint itself is not enough. We need to add extra drills to ensure that students can at least begin to read the words within that 40-minute class. It’s difficult to guarantee they will practice on their own at home.

Researcher:
As I understand it, a PowerPoint is often structured with sections for introduction, new content presentation, practice, and extension. Does this align with your teaching steps?

Teacher B:
Yes, the structure of our lessons is basically like that:

1. **Warm-up:** About 1-2 minutes, using a song or game to get students energized and ready.

2. **Presentation/Input:** We prefer to create a context or scenario to teach new knowledge. A good lesson has a coherent context from beginning to end, making students feel like they are in a story. We follow a model of «two rounds of input, one big output.» The first round of input might be teaching vocabulary, the second might involve learning sentence patterns. Small practice drills are included during the input phases.

3. **Practice/Output:** The final «big output» is where we hope students can use what they›ve learned to produce a complete piece of speech. For instance, in the lesson about family members, the final task is for them to take out their own family photos and use a few sentences to introduce their family members.

Researcher:
When you get a pre-made PowerPoint, do you follow its flow exactly, or do you modify it according to your own ideas?

Teacher B:
It depends on the type of lesson. For a regular, everyday class, like the one you saw in the recording, I would generally follow the PowerPoint's sequence. But for a demonstration class (open class) for first or second graders, or for higher grades that have exams, we prefer to redesign the lesson to fit within a complete, cohesive context, because that is more effective for student learning.

Before using it, I'll have my own lesson plan for the 40-minute period. Then I'll review the PowerPoint to see which parts I can use. I'll use what's suitable and delete or skip what isn't. I also modify some of the images in the PowerPoint.

Researcher:
You mentioned using a storyline for demonstration classes. Is that because scattered teaching is less helpful for students?

Teacher B:
Yes, a courseware with a complete storyline and a coherent context would be much more effective. The purpose of creating a context is to make the language more relevant to the students' lives. When a student learns the sentence "He is Ben," they may not understand its meaning or know when to use it. But when you present it in a scenario, for example, "Peppa Pig is introducing her younger brother Ben to a friend," the student can intuitively understand: "Oh, so when I introduce someone, I can use 'He is...'"

Researcher:
In terms of visual design, does this contextual presentation need to be very complex? For example, does the background need to be very rich?

Teacher B:
No, it doesn't. Visually, it just needs to highlight the key points. For example, to teach "I'm going to the swimming pool," all you need is an image of a swimming pool and a person walking towards it. That sense of process and context is enough. You don't need a richly detailed park background. It's better for the PowerPoint to be clean and focused on the core content.

Researcher:
In terms of design, what do you think is most important?

Teacher B:
I think what we should focus on designing is "how to let students practice through interesting formats." The aesthetic appeal of the page and the images themselves are not the most important things. The key is how to use novel formats in each section to help students learn the material.

For example, when teaching "I'm going to the playground," you could design a guessing game. Cover the image with puzzle pieces, revealing only one corner at a time, and have the students guess where they are going. As the pieces are removed one by one, the full picture is finally revealed. This method can greatly stimulate their interest.

Researcher:
Do you have any requirements for the visual style of the teaching PowerPoints?

Teacher B:
Younger English teachers are now more demanding about their PowerPoints; some are almost

“obsessive.” For example, we require the entire PowerPoint to have a consistent style and use a standard “stick font.” Images must not have watermarks and should be aesthetically pleasing. Of course, it would be best if we could use the same character with different expressions and actions, but that’s very difficult for us as teachers to achieve.

Researcher:
In terms of content, is there anything that requires special attention?

Teacher B:
In recent years, we’ve been paying special attention to ideological issues. For example, content about Christmas is now rare in English textbooks, and a text about Superman was revised to avoid promoting individual heroism. Therefore, when choosing animated characters, we should avoid using figures strongly tied to Western culture, like Superman or the Avengers, and instead use more neutral cartoon characters, like Peppa Pig.

Researcher:
If the images in the courseware are different from those in the textbook, do you find that acceptable?

Teacher B:
If the textbook has a corresponding image, it’s best to use it. That way, students won’t get confused when they review at home. If the textbook doesn’t have one, then it’s fine if the images we find ourselves don’t match in style. Students generally accept it, unless the art styles are drastically different.

Researcher:
In what areas do you think the design of dynamic graphics could be improved?

Teacher B:
Mainly in the design of game segments. The effects we can create on our own are very limited. For example:

1. **Interactive Game Effects:** For interactive games like «performing magic» or «dressing up a doll,» we can come up with the creative ideas, but we find it difficult to create the ideal animated effects.

2. **Magnifying Glass Function:** When telling a story or reading a picture book, we›d love to have a «magnifying glass» feature to highlight specific details. All we can do is crop and enlarge images to simulate this, but the effect is poor, and the images become blurry.

3. **Presentation of Chants:** When we teach chants, we can only type the text on the screen and lead the students by clapping a rhythm. It would be much more effective if we could present the whole scenario as an animated video.

4. **Sound Effects and Voice-overs:** Sometimes, to create a context, like for an alien character, we need special sound effects or voices. It›s hard for us to find suitable resources. Sometimes we have to ask students to do the voice-over and then use voice-changing software to process it, which is very troublesome.

Researcher:
How do students react to highly interactive games?

Teacher B:
They love them. Whether it’s Whac-A-Mole, shooting basketballs, or casting magic spells, as long as they feel they can “control” what’s on the screen and the screen gives them corresponding feedback, they feel a great sense of participation and accomplishment and get very excited.

Researcher:
In the lower grades, how do you assess students’ learning outcomes?

Teacher B:
We don’t have written tests, but we have assessment activities, like a “fair-style activity.” We set up several stations, such as reading word cards or having a Q&A session with the teacher. Based on their performance at each station, we award them stars, which are then tallied on a “fair card” and used as the basis for their end-of-term grade (A/B/C).

Additionally, in my daily classes, I use a physical “lottery barrel” to randomly select a few students to read aloud each day. I record their performance and provide timely feedback to parents. If the PowerPoint could

integrate a similar lucky draw or name-calling feature, it would be more convenient for us.

Researcher:
How would you describe the level of enthusiasm among young learners in your classes?

Teacher B:
First and second graders are usually very enthusiastic about answering questions, especially when a group competition element is introduced. When they see dynamic and interesting visuals, they are more willing to speak up and participate. About 50% to 70% of students will show a positive response.

Researcher:
Do they discuss the class content among themselves?

Teacher B:
Yes, they do. Especially when watching a story-based animation, they can't help but whisper with their classmates about the plot, saying things like, "That wizard looks so scary." As long as it doesn't distract from my teaching, we don't mind this kind of discussion while they are watching a video. We see it as a part of their independent thinking process.

Interview Transcript Teacher C

Interviewer: Researcher
Interviewee: Teacher C

Researcher:
My research focuses on the graphics, animation patterns, and methods of content delivery within instructional courseware. We want to understand, from a designer's perspective, how we can better support teachers. Sometimes, teachers feel that the animations in the courseware are too fast, or the pace doesn't suit their teaching style. We hope to provide some room for teachers to make adjustments based on their own needs. This is the main direction of my research. May I ask, when you are teaching second-grade students, which teaching method do you personally prefer?

Teacher C:
If the goal is to make the teaching more solid and to ensure students truly learn and retain the information, I personally prefer hand-drawing—that is, hand-drawn blackboard illustrations. I draw directly on the blackboard. I then take photos of my hand-drawn blackboard work and post them in the class group chat to help students consolidate their learning.

Especially for first and second graders, picture book reading lessons can sometimes be a bit dull, and the vocabulary load is quite large. Therefore, I combine their understanding of the text with a dynamically created hand-drawn blackboard illustration to help them grasp the content better.

Researcher:
Another teacher mentioned that when teaching higher grades, he reduces the number of illustrations on the blackboard because older students start chatting as soon as they see pictures.

Teacher C:
I mainly teach upper grades, but I find hand-drawn blackboard work to be very engaging for first and second graders.

Researcher:
What are your thoughts on using the existing multimedia courseware?

Teacher C:
I think there are too many animations. Animation should be an auxiliary tool that serves the lesson. If it's designed just for fun, it loses its meaning.

This type of courseware is often very long, and students' attention can easily wander. After a full lesson, they might only remember playing a certain game or seeing a particular animation. The effectiveness in mastering vocabulary and the overall text is diminished.

When I use this kind of courseware, I usually treat it as a supplementary tool rather than following its rhythm completely. I will edit, delete, and adjust the courseware content according to my own lesson design.

Researcher:
So, for you, PowerPoint (PowerPoint) is mainly for support, and you decide its role based on the specific type of lesson?

Teacher C:
Yes, it depends on the lesson type. If I'm teaching vocabulary and phonics, I rely more heavily on the PowerPoint because it helps students get a holistic view of the unit's words. But for lessons like picture book reading, the PowerPoint is just an auxiliary tool.

Researcher:
In terms of classroom design, how do you typically start a lesson, for example, when introducing new knowledge?

Teacher C:
The lead-in part of a lesson is very important, but the time needs to be controlled within two to three minutes. I often start with "Free Talk" and then naturally introduce the content for the day.

I believe the design of context-based teaching is crucial; it's about simulating real-life situations. If the courseware suddenly cuts to a scene, like a bus, without any setup, students will find it abrupt. They'll wonder, "We're not going to take a bus, so why are we suddenly on one?"

Therefore, there should be a lead-in, perhaps a single PowerPoint slide that tells students, "We are going to take a bus now," to give them a psychological hint. The courseware design needs to create a sense of immersion in the situation. Although some courseware includes songs or small games in the introduction to spark interest, a natural transition is still needed when moving to the core content.

Researcher:
When you use these ready-made courseware resources, what is your usual workflow?

Teacher C:
For our public demonstration lessons, the courseware is always redesigned by us. We first come up with our own concept, and then, like a pharmacist filling a prescription, we select, delete, and combine the content we need from various resources (including existing courseware packages). I will remove parts that I find long-winded or unnecessary. The final product must meet both my teaching needs and the students' learning situation.

It's a good thing that this courseware package contains a lot of content, because having more allows for selection and deletion. It's much better than not having enough content and having to search for it everywhere.

Researcher:
You mentioned adjusting based on the students' learning situation. How do you do that specifically?

Teacher C:
In every class, there are always a dozen or so students who are falling behind. For them, I need to arrange more simple content to help them build confidence first, and then gradually move to more in-depth material. The core teaching content cannot be changed, but the way it is presented and its pace can be adjusted.

Researcher:
What kind of courseware design do you think is more engaging for students and provides a more immersive experience?

Teacher C:
I think the ideal state is to make students feel like they are a "protagonist" within the animation, truly integrated into the scenario. That is what true context-based teaching is. Otherwise, the student is just a spectator, watching scenes move back and forth on the screen.

For example, instead of just playing an animation of a car driving by, it would be better to design it from the perspective of the student sitting inside the car, looking out the window. Their experience would be more realistic and interesting.

Additionally, interactivity is extremely important. I once taught a lesson where the courseware had a "magic wand turning into animals" design. As I waved my "magic wand" (the teaching pointer), the animal on the screen would appear step-by-step—first the tail, then the body. The students would wave their hands along with me while guessing what animal it was. This three-way interaction between the teacher, the students,

and the screen keeps students highly focused and makes the lesson incredibly memorable.

Researcher:
So the key is to make students feel that their actions can influence what's happening on the screen, even if it's actually the teacher who is controlling it.

Teacher C:
Yes, this gives them a greater sense of participation and the joy of thinking, rather than just passively watching. Animation can be used as a tool to capture attention, but it shouldn't play continuously. For instance, an image can be animated for a few seconds when it first appears to draw the students' eyes, but then it should stop to avoid distracting them from listening.

Researcher:
During the teaching process, how do you decide what to cut from the courseware? Which parts do you usually remove?

Teacher C:
I trim some of the lead-in and the repetitive drill sections in the middle. Especially the games—one or two per lesson is enough. Some games take too long, so I'll delete them and replace them with quicker, simpler exercises, like repeating words in a loud or soft voice, or following the teacher's actions.

However, I usually don't cut the post-lesson extension and creative adaptation parts. For students, creative adaptation is challenging and requires more support and practice. I want them to think divergently and apply what they've learned, not just mechanically repeat things. Allowing them to adapt a song or sentence pattern by substituting words after they've mastered the basics is a very important step.

Researcher:
It seems different teachers have different approaches. Some teachers feel that extension activities are too difficult and choose to delete them.

Teacher C:
I believe extension is very important. After learning knowledge, the key is knowing how to use it. Students are more interested when they can innovate based on what they've learned.

Researcher:
For younger students, what are their classroom reactions and behavioural patterns like?

Teacher C:
It's difficult for first and second graders to have effective peer discussions. If you ask them to discuss something, they will quickly start talking about other things. That's why I rarely give them free discussion time; the class is mainly teacher-led.

They have a strong need for the teacher's approval and attention. Children at this age have a strong desire for a sense of belonging and respect. Therefore, they love interacting with the teacher and hope to get immediate feedback on their answers.

They can only focus on a task if they have physical objects to work with. For example, they do very well when I ask them to use their own toy cars to act out and learn a song about transportation. Without the support of these physical props, they get distracted easily.

Researcher:
How do you assess their learning outcomes?

Teacher C:
During the lesson, I mainly use games, like the "train game" or random questions. After class, I encourage them to record videos of themselves performing stories with their parents and send them to me. I also have rewards for reciting texts, so students will proactively come to me after class to recite what they've learned.

Researcher:
Finally, from a visual design perspective, what are your requirements for courseware?

Teacher C:
First, the images and text must be well-integrated. Whether the courseware is beautifully designed is secondary; the most important thing is that the visuals match the content.

Second, it's best if the style of the visual elements is consistent. For example, having a single main character throughout the entire courseware is better than a mishmash of various cartoon images.

Additionally, the font and size are very important. It must be ensured that students sitting in the back of the classroom can see clearly. The font must be the regulated handwriting-style font (the standard balanced font), as this is the style used in their textbooks and for writing standards, making it the most familiar to them.

Interview Transcript Teacher D

Interviewer: Researcher
Interviewee: Teacher D

Researcher:
Hello, Teacher D. When you hear the term "Motion Graphic," what is your first impression or concept of it?

Teacher D:
My first impression is "things that move," like the animated stickers (GIFs) we use in chats.

Researcher:
In the teaching PowerPoints (PowerPoints) you currently use, do you feel there are "dynamic graphics"?

Teacher D:
I think so. However, regarding the effects in PowerPoint that are triggered by a click, I personally don't consider them true dynamic graphics because they are inherently static. What we need are materials that are animated by themselves.

Researcher:
In your teaching, do you see PowerPoint as the primary teaching tool or a support tool?

Teacher D:
It's a support tool. I rely more on multimedia materials and writing on the whiteboard. The PowerPoint is mainly for displaying the teaching flow and framework. A class is 40 minutes long, and without the PowerPoint as a procedural reminder, it's easy to forget what comes next.

Researcher:
Do you often modify the PowerPoint courseware you receive?

Teacher D:
I generally don't modify the review sections. However, for parts that introduce new text, I'll combine them with whiteboard writing. This is because for first and second graders, some words are long and difficult, and they don't know how to spell them out phonetically yet, so the teacher needs to guide them by writing on the board and leading the pronunciation.

Overall, I rarely change the animation design within the PowerPoint. The main reason is that it's too much trouble to modify.

Researcher:
What do you mean specifically by "troublesome to modify"?

Teacher D:
The animation design in these PowerPoints is extremely complex. If you open the animation pane, you'll see a dense list of dozens or even hundreds of animation paths. If you try to change one element, like an image, it can disrupt the entire sequence and mess everything up. I've tried to extract some materials from the lower-grade courseware for use in my upper-grade classes, and just the process of extracting and modifying was incredibly time-consuming.

Moreover, the creators of this courseware tend to cram a lot of content onto a single slide, using complex animations to reveal it piece by piece. When we create our own courseware, we prefer to have one core piece of content per page. It's cleaner and much easier to modify.

Researcher:
Since modifying is so troublesome, do you tend to use other methods to compensate instead of altering the PowerPoint itself?

Teacher D:
Yes. If I feel a part of the PowerPoint is moving too fast for my pace, I'd rather use my presenter remote to manually control the slides or just use the whiteboard for teaching. Once the students are familiar with the content, I'll play the animation. I wouldn't try to change the animation speed itself. Different classes have different reaction speeds—one class might be fast, another slow. Adjusting the animation for each class would consume a lot of energy. As a teacher who teaches both upper and lower grades, my energy is more focused on the upper grades.

Researcher:
When you receive a new PowerPoint courseware, what parts do you focus on the most?

Teacher D:
First, I look at the lesson's teaching objectives and key difficulties. Then, I focus on the games and introductory activities it has designed. I'll assess whether these game segments are interesting and if they align with the key content of my lesson.

Researcher:
What do you do if the game sections in the PowerPoint have too much content or are too time-consuming?

Teacher D:
I'll replace them with my own games. We have a few fixed, simple-to-operate games that work very well. For example, I'll write the words on the blackboard, and after leading them through a few readings, I'll draw a "bomb" next to one word. The group of the student who gets called on for that word has to accept a fun "penalty." First and second graders find this hilarious. We also have games involving "loud and soft voices" and "finding objects." These are very practical and more flexible and time-saving than operating complex PowerPoint games.

Researcher:
In your observation, what are the differences in classroom reactions between first and second graders?

Teacher D:
First graders are more active and their attention is more focused. For them, everything is new.

By the time they get to second grade, they've seen all sorts of PowerPoints and games, they know the routine, and sometimes they feel, "This is so boring, it's the same old stuff," so they get distracted easily. Also, they are exposed to much more than we were as children—smartphones, TikTok, Xiaohongshu... The content on these platforms is far more exciting than our simple classroom animations. As a result, their threshold for excitement is higher, and it's harder to impress them with simple classroom animations.

Researcher:
Faced with these "well-informed" second graders, what methods are more effective for capturing their attention?

Teacher D:
Games and reward systems still work. For example, using group competitions to spark their competitive spirit. Additionally, they have a high level of interest in videos. Our courseware includes some demonstration videos recorded by outstanding students. When these videos are played, they usually watch very attentively and are willing to learn from them. In general, as long as it's dynamic content with sound and visuals, whether it's an animation or a live-action video, it can capture their attention to some extent—at least better than just the teacher talking.

Researcher:
How do you strategically arrange game segments at different stages of a lesson?

Teacher D:
The games in the courseware are usually placed in the middle part of the lesson to tackle key and difficult points. As for my own games, I insert them flexibly based on the actual classroom situation. For instance, when I clearly sense that the students are starting to lose interest and their attention is wandering, I'll use a quick mini-game to pull their focus back.

Researcher:
If you were to rank the appeal of these three dynamic formats—videos, songs, and games—how would you rank them?

Teacher D:
I think the most appealing would probably be **videos**, because they love watching the stories inside. Next

would be **games** and **singing**, which are about the same. However, this also depends on the grade level. First graders, who are new to English, might find games more appealing. But by second grade, they are already familiar with the common game routines, so watching a novel video might be more interesting for them.

Researcher:
In your opinion, what aspects of an ideal teaching courseware should be focused on for design and improvement?

Teacher D:

1. **Increase the Fun Factor of Dynamic Images:** We hope for more interesting, self-animating images that have the lively effect of stickers or GIFs.

2. **Visual Style Should Be Cartoonish:** The designs should be cute and cartoon-like to match the aesthetic of lower-grade students. They can›t understand abstract, icon-style designs.

3. **Integration with Textbook Content and Art Style:** It›s best to use the original characters and illustrations from the textbook whenever possible. This helps students connect the courseware with their books. If original characters are needed, their art style should try to maintain some consistency with the textbook.

4. **Avoid Inappropriate Content:** Do not use images with violent tendencies or those that don›t align with mainstream ideology. For example, we now generally avoid Western characters that promote «individual heroism,» like Superman.

5. **Provide Simple yet Modifiable Options:** The courseware should ideally allow teachers to make simple, personalized modifications (like adjusting speed) and provide clear instructions on how to do so. However, this modification process must not be too complex.

6. **Ensure Technical Compatibility:** The final product must take into account the compatibility issues of school computers. Using universal formats (like PowerPoint) is much safer than special software to avoid technical problems like broken video links or animations that won›t play.

Researcher:
For young students, which do you think is more important: visual splendour or the fun factor of the teaching activities?

Teacher D:
The fun factor of the teaching activities is more important. When explaining core knowledge points like vocabulary and phrases, the background should be white or a light colour, and the design should be simple to avoid distracting them with flashy elements. However, for segments like games and videos, the design can be richer and more colourful to attract them. Having one or two particularly cool and eye-catching segments in a lesson is enough. If the entire lesson is overly flashy, they will actually feel fatigued.

Interview Transcript Teacher E

Interviewer: Researcher
Interviewee: Teacher E

Researcher:
When you hear the term “motion graphics,” what first comes to your mind? How does it relate to the courseware you use in your daily teaching?

Teacher E:
The first thing that comes to mind is graphics that can move. In teaching, motion graphics are very useful when we need to explain certain concepts. For example, to explain the word “nervous,” I might insert a relevant animated GIF or emoji into the PowerPoint (PowerPoint). This way, students can more intuitively understand the word’s meaning through the character’s mood or actions.

Researcher:
My research focuses on the visual design within this type of instructional courseware. Currently, the lower

primary grades (first and second grade) in Guangzhou are using a unified set of PowerPoint courseware. This type of courseware typically includes many fun animations and videos to attract students. We want to understand, from a designer's perspective, how we can improve this kind of courseware.

Teacher E:
For students in the lower grades, this type of fun and engaging courseware is indeed more attractive to them.

Researcher:
How do you personally use this official courseware? What is your teaching style like?

Teacher E:
Although I taught first and fifth grade this semester and haven't officially taught second grade yet, the teaching methods for the lower grades are quite similar.

For first and second graders, their attention spans are very short. In a 40-minute class, it's already excellent if they can stay fully focused for 15 minutes. Therefore, if teaching relies solely on textbooks, they will find it extremely boring and might not even last 15 minutes. So, my teaching is primarily based on the PowerPoint courseware, supplemented with blackboard work for key points.

Researcher:
How do you prepare before using this extensive courseware?

Teacher E:
Before a lesson, I will definitely review the textbook content first, and then open the PowerPoint to compare. However, this courseware often has over fifty slides, and it's impossible to cover all the content in one lesson; students basically can't keep up in the latter half. Therefore, I must heavily edit and cut down the content based on the actual classroom situation, as it contains a lot of repetitive drill exercises.

Researcher:
How do you maintain students' attention? Do you rely entirely on the PowerPoint?

Teacher E:
The PowerPoint and teaching methods must be used together. While the PowerPoint itself is interesting, teaching in the lower grades involves a great deal of repetition. For example, if a lesson covers five words and two sentence patterns, they will become bored after you lead them through it two or three times.

At that point, I have to step away from the PowerPoint and lead them in physical games, like "playing train" (a word-chain game). Letting them stand up and move their hands and feet helps them concentrate better. If we just follow the PowerPoint monotonously, many students will stop participating and following along.

Researcher:
What content in the courseware typically gets the most enthusiastic response from students?

Teacher E:
Their reaction is strongest when they see something familiar or interesting. For example, if a picture of a hamburger pops up on the screen before the word itself is shown, they get very excited. Children are always highly emotional when it comes to topics of "eating" and "playing."

Additionally, if the courseware incorporates familiar cartoon characters, like "Peppa Pig," they become more interested and willing to follow along. The courseware once used the Peppa Pig family as protagonists in a "family trip" scenario to teach prepositions of place, and the students were very engaged.

Researcher:
When these fun elements appear, do the lower-grade students start discussing among themselves or

chatting privately?

Teacher E:
Yes, they do. Younger students have weaker self-control, and they can't help but talk to their neighbours when they see something interesting. That's why classroom management is very important. We often use a reward system, such as awarding stars to groups, to maintain discipline through their competitive spirit.

Researcher:
Do you think it's better for this competition mechanism to be used flexibly by the teacher in the classroom, or to be designed directly into the PowerPoint?

Teacher E:
If it can be designed into the PowerPoint and presented in a very intuitive way, that would also be great. For example, if it could clearly show their group's score changes, just like drawing stars on the blackboard, it would be more motivating.

Researcher:
Among different types of teaching activities—such as games, watching videos, singing, or simple repetition—which is most effective in engaging students?

Teacher E:
If I were to rank them, games are the most effective, followed by watching videos, and lastly, simple repetition.

When it comes to repetition, if it's just mindlessly repeating, they get bored quickly. So we add a sense of rhythm, like clapping while reading, turning the repetition into a mini-game. They are more willing to participate this way.

Researcher:
The courseware itself includes many games. Do you use them directly?

Teacher E:
Yes, I do. Especially the games at the beginning of the courseware that review vocabulary from the previous lesson; they are very helpful for review and memorization. The most popular games are those that students can physically operate on stage. For example, dragging and dropping pictures on the touchscreen to match them. When students find that their actions can move elements on the screen and generate feedback, their enthusiasm for participation is at its highest.

Researcher:
In your opinion, what is the overall quality of this official courseware? What aspects could be improved?

Teacher E:
Strengths:

1. **Decent Quality:** Overall, it›s well-made, much better than in our childhood when teachers just brought a tape recorder to class.
2. **Comprehensive Content:** It effectively presents the teaching objectives and textbook knowledge, and also includes some extra extension content.
3. **Visual Appeal:** Compared to just a textbook, the dynamic and audible courseware is much more attractive to students.

Areas for Improvement:

1. **Overly Complex Content:** The biggest issue is that there is too much content, and it›s too wordy. The most common modification I make is deletion.
2. **Difficult to Modify:** The animation and element layers in the courseware are very complex. It›s very troublesome to modify a specific detail (like deleting an unnecessary animation), as it takes a

lot of time to find the corresponding part. Sometimes I›d rather just delete all the animations on a slide and have the content appear all at once.

3. **Inappropriate Sound Effects:** Most of the sounds are fine, but sometimes there are abrupt or even scary sound effects. For example, when teaching animal sounds, a very fierce dog bark was used, which scared the younger students. The sounds should be more child-friendly and whimsical.
4. **Weaker Storytelling:** The courseware›s design for vocabulary teaching is diverse and effective. However, in the storytelling modules, the fun factor is relatively weak due to the long sentences and text that need to be presented. It mostly consists of text and dialogues popping up, which is a bit bland.

Researcher:
You mentioned the “Double Reduction” policy. What specific impacts has it had on teaching and assessment methods?

Teacher E:
Under the “Double Reduction” policy, first and second graders are not allowed to have paper-and-pencil tests. The final assessment is conducted through a “fun fair” format, where students complete challenges at different “booths.” For example, at the vocabulary booth, a student passes by correctly reading a few words pointed out on a turntable.

For middle and upper grades, while there are still test papers, the name has been changed from “test” to “exercise.” Scores cannot be given, only grades, and the papers are not sent home to parents.

The policy’s intention is good—to promote a more well-rounded education by increasing time for physical education, art, and labour skills. However, on the other hand, the class hours for core subjects like Chinese, Math, and English have been reduced, while the curriculum content and exam difficulty have not decreased, and have even increased. This has led to a noticeable decline in students’ overall academic abilities compared to before the policy was implemented.

Researcher:
Without paper-and-pencil tests, how do you assess students’ learning outcomes?

Teacher E:
In the classroom, I primarily rely on observing their reactions. For example, near the end of a lesson, I will ask the whole class to recite a short poem we learned without my lead. During this time, I will pay attention to who isn’t opening their mouth to follow along, which helps me gauge their mastery.

For young students, their in-class responses—whether answering questions or participating in activities—are the most direct feedback. It reflects whether they have absorbed the material.

Researcher:
Finally, to summarize, as a lower-grade teacher, what is your most fundamental need from instructional courseware?

Teacher E:
The most fundamental need is that the courseware must **intuitively and clearly present the content I need to teach**, and in a way that students can also intuitively understand what is being taught. It needs to be able to spark their interest and guide them to connect new knowledge with what they already know.

From a user’s perspective, the biggest pain point is that it’s **too difficult to modify**. It would be much more helpful if teachers could more easily personalize it through deletions and adjustments.

In terms of content arrangement, games are necessary but should not overshadow the main lesson. Games are best used for warm-ups, reviewing prior knowledge, and consolidation after class. During the core part of teaching new knowledge, what’s more important is **scenario-based design** that allows students to immerse themselves and truly understand the content, rather than just playing games.

Interview Transcript Teacher F

Interviewer: Researcher
Interviewee: Teacher F

Researcher:
Hello, Teacher F. When you first see the term “Motion Graphic,” what is your first impression or concept of it?

Teacher F:
My first thought is of data-related charts, like trend graphs or line graphs—the kind of statistical charts that change dynamically.

Researcher:
The concept of “dynamic graphics” that I’m researching actually includes all the moving visual elements we see in classroom PowerPoints. For example, animated effects triggered by clicks, image assets that move on their own, and even complete animated shorts. The purpose of my research is to understand the needs of teachers and students to design visual content that can better support teaching.

Teacher F:
Oh, I see. So you mean the animation effects and image assets within the PowerPoint.

Researcher:
In your daily teaching, how do you position the roles of tools like PowerPoint, textbooks, and multimedia (such as the Seewo Whiteboard)?

Teacher F:
We now spend most of our class time using PowerPoints; we rarely use only the textbook. After all, the school provides convenient multimedia equipment. The small amount of remaining time is used for students to open their books, circle key vocabulary, take notes, or practice reading along with their fingers. Additionally, we intersperse our own little classroom games.

Researcher:
Do you make modifications to the standardized PowerPoint courseware provided by the city?

Teacher F:
I do make adjustments based on the actual situation of the students in my class. This set of courseware has a very large amount of content. If your class has a strong foundation, you might be able to get through it all. But if the students’ foundation is weaker, you might only get through 60% or 70% of the content. Therefore, we make deletions in advance during lesson planning, especially some of the final application sections, which are time-consuming and usually get cut.

Researcher:
How do you typically modify it? Do you delete sections directly, or do you change the content, images, or animation speed?

Teacher F:
It’s almost always direct deletion; I rarely modify the content. This is because this courseware was created by a team of top teachers in the city, and the content quality is very high. The modifications we make are mainly to remove sections we deem unnecessary. For example, some teachers feel there are too many read-aloud repetitions or that the pointing-finger animation is cumbersome, so they delete it. I personally don’t delete much because the students in my class have a good foundation and can keep up.

Researcher:
You mentioned that you intersperse your own classroom games. How are these different from the games in the PowerPoint?

Teacher F:
The games in the PowerPoint, which we also call “mini-games,” are essentially just different formats for read-aloud or high-frequency word drills. They lack the atmosphere of a live group competition. Our own games, on the other hand, are live and flexible. For instance, we organize group competitions where a student comes up to the front to act out a word, and the classmates guess. This type of game is more adaptable and better at creating a lively classroom atmosphere.

Researcher:
Why is it necessary to add your own games? Isn't the content in the PowerPoint enough?

Teacher F:
Using only this courseware would be very "plain" (monotonous). Students find it interesting at first, but after a while, they get tired because the courseware requires them to repeat things over and over again. Moreover, the second-grade curriculum is inherently quite content-heavy and difficult to pronounce, making it the most challenging grade to teach. The students are young, they only have two or three classes a week, and they forget things quickly. So, we need to intersperse different activities to maintain their interest in learning.

Researcher:
After using this courseware with its rich animations, what changes have you observed in student reactions compared to before?

Teacher F:
Of course, it's much better. In the past, we teachers rarely spent a lot of time creating PowerPoints for first and second graders; at most, we'd use the "Jin Tai Yang" CD-ROM to play some songs. With this new courseware, the teachers' preparation burden has been greatly reduced, and the students' concentration and interest in learning have significantly increased.

One noticeable change is that the students are now very familiar with the "routines" of this courseware. For example, when a clapping hands icon appears on the screen, they know this part requires them to clap. When a read-aloud gesture icon appears, they automatically start reading along without needing extra instructions from the teacher. They've been using it since first grade, so they are very familiar with it.

Researcher:
Do they actively communicate with you or discuss the PowerPoint content with their classmates?

Teacher F:
Unless there is guidance and encouragement from the teacher, they rarely initiate in-depth discussions on their own. Most of the time, the teacher needs to lead. Of course, they do follow the rhythm of the courseware because the animations keep them engaged.

Researcher:
During your use of the courseware, have you observed any unexpected "special reactions" from students to certain games or images?

Teacher F:
This courseware has gone through multiple rounds of review, so the content is free of any negative influences. The students' reactions are also within expectations. They are more interested in game formats they are familiar with and enjoy, such as segments designed to mimic popular mobile games, which can instantly grab their attention. The asset selection in the courseware is very well done.

Researcher:
From your perspective as a user, what other areas of this courseware do you think could be improved?

Teacher F:
I feel that **the read-aloud sections are a bit too numerous** and could be appropriately trimmed. After all, the courseware is just a tool, and it must be combined with the actual classroom situation. When students are already tired and don't want to read, forcing them to continue with even longer content won't be effective. This is when we teachers need to use real-world rewards, like small gifts, or our own games to motivate them.

Researcher:
Some teachers have mentioned that they want to modify the courseware, but find it very difficult because the animations are too complex.

Teacher F:
Yes, it's very difficult to modify. But this is understandable because it is the product of a research group; they can't just release all the editable source files for you to copy. It requires a certain level of computer skill from the teacher. But the reality is that many teachers, especially those who have to teach multiple grades, don't have the energy or time to figure out how to modify such complex courseware. So, the approach for most is to teach as much as they can, and if they can't finish, they just ensure the most basic content of the lesson is covered.

Researcher:
In terms of visual design, such as fonts, colours, and artistic style, do you have any suggestions?

Teacher F:

- **Font Size:** I think the current font size is quite good. It›s large enough for students sitting in the back to see clearly.
- **Sound Effects:** Sometimes the sound effects can be too loud, and we end up turning them off.
- **Screen Design:** I think the design is excellent. It›s not flashy at all; everything that could be simplified has been. The images for the scenarios are also very appropriate and clear.
- **Image Style:** The images from the textbook must be used, as students need to review at home and shouldn›t feel that the material is unfamiliar. To maintain a consistent style, other supplementary images should also be in a cartoon style rather than real photos. Although the cartoon styles on different pages may not be identical, this is acceptable for the sake of highlighting the scene. Of course, if the entire style could be unified, that would be even better.
- **Colour Palette:** As teachers, we pay less attention to colour. Our main concern is whether students can understand the context through the images to achieve the teaching objective. We›re not teaching an art class, so we don›t scrutinize whether the colour combinations are perfect.

Researcher:
If you were to design the ideal second-grade teaching courseware, what would be your biggest need?

Teacher F:
The core need is **to help students overcome the key and difficult points of the lesson**. As for the visual aspects like drawing and animation, they don't need a huge amount of effort, as long as they serve their purpose. Of course, the courseware needs to include some fun games that can spark students' interest and encourage them to speak.

Overall, the most important thing is the content. **The images and the teaching content must be precisely matched**. This is the most fundamental requirement.

Researcher:
What are your thoughts on incorporating more interactive games into the PowerPoint, for example, allowing students to touch the screen to operate them?

Teacher F:
Students would definitely love this kind of touch-based game, but it would make it more difficult to manage classroom discipline, and the scene could easily become chaotic. Therefore, before using such games, the teacher needs to have the ability to manage classroom discipline effectively.

Researcher:
So, do you have any specific functional or formal suggestions for us as designers?

Teacher F:
If you could develop some novel game formats, like simplified versions of mobile games, that are both lively and fun, and can also train their word recognition skills and encourage them to speak, that would be great. These mini-games could be embedded as plugins into the PowerPoint. As for formats like the Seewo Whiteboard, we only have two or three classes a week, so there's no need to make it that complicated.

Researcher:
Finally, do you think an ideal courseware should be like the current one—content-rich, allowing teachers to make their own cuts—or should it be more like a template that provides space and guidance for modification?

Teacher F:
I prefer the first option, where the content is made compact and rich. As for modification guides, they can be provided as an appendix for teachers to reference. Every teacher's situation is different; some want to modify it, others don't. Direct deletion is the simplest and most straightforward method. Having more content gives us the flexibility to choose, which is better than not having enough content and needing to

add it ourselves.

Interview Transcript Teacher G

Interviewer: Researcher
Interviewee: Teacher G

Researcher:
My research is primarily about the animations and other motion graphics within instructional PowerPoint courseware, exploring how better design can assist teachers and students in English learning. Currently, most courseware is created by teachers, not professional designers; even when designers are involved, they may lack an educational background. My research aims to combine these two fields to provide some guidelines for the design of instructional courseware. First, I want to understand the needs of the primary users—teachers and students.

Teacher G:
My understanding of "dynamics" is graphics that move and change, like the GIFs or emojis we often use. The elements in a PowerPoint that pop up or move after a click also fall into this category of dynamics.

Researcher:
What role does PowerPoint courseware play in your teaching?

Teacher G:
Personally, I'm the type of teacher who doesn't rely heavily on PowerPoint; I can teach a class with just a book in hand. However, PowerPoint does provide students with a more intuitive experience, especially in classrooms with poor hardware conditions, like a small blackboard, where PowerPoint becomes necessary.

However, since this courseware isn't made by me and I don't have time for extensive modifications, I usually only extract a portion of it to use or open a separate Word document to type out key points for them to see. For me, PowerPoint is more of an auxiliary tool rather than the core of my teaching.

Of course, today's primary school students are already accustomed to the model of learning with PowerPoint, so having it is more effective. I personally prefer using a digital tablet for blackboard work because it allows me to clearly display the structure and logic of the knowledge (for example, by drawing mind maps). But if there's a lot of text, I'll still use a PowerPoint for clarity.

Researcher:
How do students of different age groups respond to dynamic courseware?

Teacher G:
The differences among the target students are huge, and their needs for animation are completely different.

- **First and Second Graders:** At this stage, especially for first graders who have just come from kindergarten, their interest needs to be cultivated. You can›t possibly capture their attention with just a book. You must rely on a large number of videos, pictures, and animation effects. As long as something is moving, has sound, or is a video, they will love it. A fun song can sometimes keep them engaged for an entire lesson.
- **Upper Grades (e.g., Sixth Grade):** For upper-grade students, excessive animation can actually be counterproductive by distracting them. Sometimes, just placing a static image of a celebrity (like Kobe Bryant) on the PowerPoint is enough to get them talking excitedly. Therefore, I don›t use much animation when teaching upper grades.

Researcher:
Does the students' family background and region affect their response to classroom activities?

Teacher G:
The impact is huge. Students from different regions and family backgrounds have completely different levels of exposure and reaction speeds.

Students in the city center (like Tianhe or Yuexiu districts) generally react faster and are more proactive. Their parents place great emphasis on well-rounded development, and their weekends are filled with classes like public speaking, debate, and basketball. These experiences make them more active and willing to interact in the classroom.

In some other areas, students might appear more passive, sitting there like a “stone Buddha” with little reaction. Therefore, teaching methods must be adjusted according to the students’ actual situation (what we call “xueqing,” or learning situation).

Researcher:
If a ready-made, well-designed PowerPoint courseware were provided to you, what would be its biggest benefit? What are your requirements for such courseware?

Teacher G:
It would definitely be a good thing. First, it would save me a lot of time in brainstorming and creation. Second, I could study the logical structure of the courseware. If it’s well-designed, I can adopt it directly and combine it with my own teaching ideas.

My requirements for such courseware would be:

1. **Easy to Modify:** This is the most important point. Animations are fine, but the controls must be simple to allow for easy modification by the teacher. For example, I should be able to easily change a word in a game or adjust the content of a section. The most difficult things to modify are games with complex animation structures, like «Whac-A-Mole.» The animation effects are layered, with elements flying in and out and being covered by other objects, making it very hard to edit a single word inside. The best solution would be something like a template, with clearly marked editable areas that allow teachers to simply click and modify.

2. **More Content is Better Than Less:** I prefer the courseware to provide richer and more complete content. This allows me to make my own selections and deletions based on the level of different classes (e.g., advanced classes vs. regular classes). If the content is «just right,» it becomes troublesome if my teaching pace is faster or if I want to add extension materials.

3. **Visually Accurate Content:** As teachers, we generally don›t get too caught up in whether the pictures and colours are «beautiful.» The core requirement is that the content **must be accurate and not mislead students**. For instance, teaching the word “park” with a picture of an “amusement park” is a mismatch. As long as the content is accurate, suitable for the students’ cognitive level, and free of any negative guidance, we can usually accept it.

Researcher:
How do you assess students’ learning outcomes in the classroom?

Teacher G:
Mainly through their in-class responses. You can tell if they’ve learned it by asking one or two questions. In the last ten minutes of class, I conduct checks, sometimes by questioning them one-on-one.

Younger students love to be around their teacher and will proactively share what they’ve learned during breaks. Through these daily interactions, I can get a general idea of their level of mastery. I pay special attention to students who are not focused or active in class. For example, I use a “little red flower” point system to motivate them. I might ask, “Why did you only get one little red flower this time? Do you want two next time?” and then guide them to answer questions about what was taught to see if they were really listening.

Researcher:
Do you think courseware needs to have built-in “teaching instructions” to guide teachers and students on what to do next?

Teacher G:
It’s best not to display them directly on the slide, as this would limit the teacher’s flexibility. If needed, they can be placed in the “notes” section at the bottom of the PowerPoint.

The clarity of teaching instructions is more the teacher’s responsibility. For example, if you show a picture without telling students what to do, they will be confused. You need to give specific and clear instructions, such as “Let’s guess what problem is happening in the picture,” rather than a vague “Let’s look at this picture.” Students will respond when they receive clear instructions.

Researcher:
How does the teaching model at private institutions (like Cambridge English courses) differ from that in public schools?

Teacher G:
The courses at private institutions are highly purpose-driven, aimed at exam preparation, grade advancement, and future study abroad. The students are very clear that they are not there to “play,” so their level of focus is extremely high.

In this environment, the teaching model, ironically, becomes very “traditional.” The PowerPoints provided by the institution are very simple—just pictures and answers. My teaching also incorporates a lot of blackboard work and note-taking, and the students are already accustomed to this model. They will proactively ask, “Teacher, give us more notes; we’ll just copy them down.”

Although this method is very exam-oriented, under the current education system, it is quantifiable and produces results. Therefore, it’s difficult to simply judge it as good or bad.

Phase 1: detailed description of specific design guidelines

Topic 1: Motion graphics design, lesson flow and attention

(1) Trigger students' involuntary attention

Quickly attract students' attention and trigger involuntary attention, guiding them into a learning state.

Effective attention-grabbing methods:

Use video clips/animations

- Teachers commonly use videos as opening guides.
- Videos stimulate students' interest through continuous images and motion.

Support from design theory

- Faraday (2000): Motion visual elements attract attention most effectively.
- Educational psychology: Motion and visual changes are key to triggering involuntary attention.

Visual design strategies (attention-capturing):

Strong contrast between stimuli

- Size contrast (e.g., large vs. small objects) enhances visual impact.

Stimulus intensity

- Images and graphics are more effective than text.
- Colour contrast is more effective than text features (e.g., font style) in visual appeal.

Novelty and uniqueness

- Novel or unfamiliar visual elements trigger students' curiosity.
- Repetitive content or format reduces interest.

Notes:

Novel elements may cause cognitive load; overly unfamiliar content may be hard to understand, while teachers believe moderate novelty stimulates curiosity and engagement. Design should balance attention capture with avoiding cognitive overload.

(2) Clear expression, transformation to voluntary attention

Clearly presenting learning objectives helps students build expectations of learning outcomes and motivates them to complete tasks. It supports the development of voluntary attention.

Design strategies:

To ensure clear communication, information should be presented concisely and logically, avoiding redundant or irrelevant visual elements.

Avoid distraction:

Over-decoration or off-topic graphics may distract students, reducing their focus and cognitive efficiency.

(3) Visual accuracy and support interactive activities, maintain voluntary attention

Activate students' prior knowledge or life experiences as a foundation for introducing new content, often through interactive activities.

Design strategies:

- Graphic content should closely align with interactive activities to enhance teaching effectiveness and logical coherence, helping students understand the task purpose and engage actively.
- Visual design should ensure visual accuracy and cognitive compatibility. Visual elements must match students' cognitive experiences to avoid misunderstanding and align with their existing visual impressions.
- The speed of motion effects should match the students' response pace. Motion speed should match their reading and reaction speeds to ensure clear information recognition and timely responses, thereby maintaining attention and engagement.

(4) Reducing florid expressions for new content instruction

Simplify motion graphics during the presentation of new content.

Design strategies:

- Students' attention is highly focused, so content delivery must be clear and effective. Design prioritises clarity and accuracy, avoiding visual distractions.
- Motion graphics design avoids overstimulation. Flashy or intense visuals may divert attention. Unnecessary motion effects and decorative elements, especially those unrelated to understanding, are reduced.
- Use white backgrounds to enhance content visibility.

Notes:

- Retain some decorative elements but reduce interaction and keep the layout simple.
- Do not completely remove motion effects; moderate use maintains visual

engagement.

- Use motion effects only to emphasise key content, supporting key points and avoid drawing attention to irrelevant graphics or movements.

(5) Support interactive activities, enhance voluntary attention

Students enter the ‘attention decline phase’, showing signs of fatigue and distraction. Voluntary attention is reinforced through various interactive activities. Teachers encourage richer motion graphic design but advise avoiding repetition and complexity.

Design strategies:

Direct interest: Design properties that matches students’ preferences, such as popular cartoon characters or familiar life scenarios.

- Teacher observations: Cultural elements aligned with students’ experiences better stimulate engagement.
- Design should consider students’ media exposure and cultural diversity.

Indirect interest: Motivate through task outcomes, such as competitions or reward.

- Even if the task itself is not attractive, winning a game or receiving praise encourages active participation.

Notes:

Blurred images, incorrect information, or disorganised visual hierarchy weaken teaching effectiveness.

(6) Maintaining two facets of attention

Output and assessment occur simultaneously. Students enter the ‘fluctuation and recovery phase’ of attention, requiring alternating use of voluntary and involuntary attention.

Design strategies:

- Use diverse interactive activities to support the output and assessment phase.
- Motion graphics in PowerPoint serve as tools for task guidance and attention triggering.
- Visual design is more varied, flexible, and task-oriented, not decorative.
- Activities should be designed with variety to keep students engaged.
- Video clips can be reintroduced (e.g., in ‘Let’s Watch’ segments to review lesson content).

Topic 2: Motion graphics and situated learning in the classroom

Design focus: constructing contextually meaningful simulated scenarios

- Motion graphics should not only aim for sensory appeal but should also serve the construction of the contextual scenario.
- Contexts should be specific, coherent, and connected to real-life experiences to help students understand word meanings.

Importance of contextual coherence

- Teachers emphasise that the entire vocabulary teaching process requires consistent contextual presentation.
- Coherent contexts support students in understanding and remembering vocabulary and enhance the fluency of language use.

Thematic relevance and contextual consistency

- Each lesson has a theme, and contextual design must closely revolve around it.
- Every property of motion graphic design should contribute to the construction of the specific scenario.

Design according to contextual requirements in the lesson plan and interactive activities

- Interactive activities include specific contextual requirements for motion effects (e.g., ‘put the sweater into the autumn basket’).
- Motion graphics must accurately present the scenario based on these lesson plan to ensure cognitive alignment and focused learning.
- Avoid adding design properties unrelated to the theme to prevent cognitive interference and contextual inconsistency.

Topic 3: Graphics and photos in visual expression

Design insight: Complementary use of photos and graphics based on teaching goals and vocabulary types.

Functions of photos:

- Suitable for presenting concrete, perceptible objects (e.g., apple, car).
- Ideal for present realistic scenario and delivering information-dense content.
- Can enhance semantic recognition and memory retention.

Functions of graphics:

- Illustrating human actions, contextual development, and abstract concepts (e.g., opinion).
- Aesthetically aligned with young learners' preferences, helping reduce cognitive load and maintain attention.

Teacher-recommended visual expression strategies:

- Use graphics as the primary choice, with photos as a supplement
- Employ photos to emphasise realism in context and to support recognition of specific objects
- Use graphics to depict instructional tasks, interactive behaviours, and to capture attention effectively.

Topic 4: Instructions for modifying motion graphics

- Teacher recommendation:
  Embed concise, motion-specific modification tips directly into the 'Notes' section of each slide to aid teacher preparation.
- Simplicity and accessibility:
  Instructions should be brief and easy to understand, minimizing additional workload or cognitive load during lesson planning.
- Lesson plan integration:
  Include corresponding motion graphics modification guidance in the written lesson plans to support coherent and consistent preparation.
- Consistency in implementation:
  Providing standardised editing guidance ensures uniform instructional quality during pilot implementation across different teachers.

Topic 5: Visual cues and visual consistency

Visual consistency in cues guides and triggers student learning behaviours by maintaining similarity or sameness in design elements.

Maintaining consistent visual cues in design

- Use similar designs for elements with the same function (e.g., dialogue boxes) in teaching materials to speed up student responses and reduce explanation time.
- When designing motion graphics, identify elements with the same function across courses and apply unified visual expression to reduce cognitive load and improve teaching efficiency.

Repetition to enhance consistency

- Robin Williams (2015) considers repetition an effective method to achieve design consistency, connecting separate parts and enhancing overall unity and coherence.

  Thus, repeated use of visual cues is key to maintaining visual consistency.

Teacher feedback shows that textbook visuals help students connect classroom learning with textbooks and reduce confusion from unfamiliarity.

Recommendations for applying textbook visual elements

- Designers should proactively integrate visual elements from textbooks into key content, new knowledge explanations, and repeated practice stages.
- In vocabulary teaching, diverse expressions are necessary, with textbook visuals as an important option.
- Maintain novelty in teaching content and avoid sole reliance on textbook materials to sustain student interest.

Visual consistency of textbook-specific characters

- Maintain consistency with specific textbook characters that appear throughout elementary English learning and are familiar to students, to reduce disconnection between classroom content and textbooks, enhancing learning continuity and student identification.

Topic 6: Intuitiveness of visual expression

Design according to students' cognitive development

- Second-grade students rely more on intuitive ways to receive information; teachers emphasize that visual expression should be simple, clear, and direct.
- Students' need for intuitive understanding directly determines that animated graphics should avoid complex or ambiguous expressions.

Design requirements: convey information directly, accurately, and clearly

- All design properties should intuitively and accurately convey the required information, reduce cognitive load, and increase understanding and learning interest.
- Avoid using visual metaphors or analogies that may cause misunderstanding, unless guiding, reasoning or guessing is needed for a specific teaching purpose.
- Avoid visual complexity; overly complex or vague visuals increase difficulty

in understanding, cause resistance, or reduce students' interest in learning.

Topic 7: The impact of familiarity

Students react differently to familiar and unfamiliar teaching content and visual elements

Effect of familiar content:

- Students show more positive learning responses because they already have a knowledge base.
- Repeated appearance of familiar content increases students' confidence and engagement.
- Familiar visual elements (such as well-known characters, patterns, or introduced visual cues) more easily attract students' attention and interest.
- Excessive repetition of familiar content may reduce students' interest and cause monotony.
- The design should control the frequency of familiar content to avoid a mechanical learning experience.

Effect of unfamiliar content:

- Students need more time to understand and internalise new information.
- When approaching new knowledge, some students may participate less in class because they fear making mistakes.
- Novel visual designs bring freshness to the class and stimulate students' curiosity and desire to explore.

Topic 8: Text

Font Size

32pt as the body text, the main content font size

Functional texts:

Lesson Title: 36pt
Section Title: 40pt
Section Label: 12p.

Other:

18pt for course notes information
24pt for content listings.

Font colour

The main method of using colours in text is as follows:

Black: used most frequently on pages with a white background. The black-and-white contrast enhances text readability and serves as the basic colour for delivering general content.

White: used when the background is dark or coloured to ensure text visibility and contrast.

Other colours (non-black and white): used as accent colours to highlight content that needs special attention, such as keywords in classroom teaching, providing the visual cues.

Font (typeface)

The font type used for the main content in the motion graphics is **Comic Sans MS**.

Topic 9: Colour

As a result of the teacher interviews and the visual analyses, they both show that there are no specific requirements or patterns of colour use. On this basis, combining with the continuity of colour use in decorative and functional visual elements identified in the analysis, the researcher developed the following test attempts:

- Use different dominant colour schemes across different lessons, in order to explore teachers' and students' preferences regarding colour through testing.
- To examine the potential of colour as a functional visual cue, this test applies a consistent layout design within functional slides while varying the dominant colour scheme according to each lesson. This approach aims to maintain visual consistency within individual lessons and explore whether specific colour schemes enhance the functional clarity of these slides.
- To remove decorative elements (decorative borders), in order to investigate whether their presence has any substantive impact on teaching effectiveness.

Topic 10: Sound

- Sound as an effective teaching aid: Most teachers agree that sound can enhance students' learning experience, help maintain attention, and support

comprehension of instructional content.

- Effectiveness depends on usage and context: The impact of sound is closely linked to how, when, and in what context it is applied.
- Drawbacks of mechanical narration: Monotone voice narration without intonation or emotional expression can cause student fatigue and reduce learning interest.
- Engaging sound effects are more appealing: Imitated natural sounds, personified character voices, and sound-based feedback related to learning tasks can effectively capture students' attention.
- Particularly beneficial for Grade 2 students: Playful sound effects and background sounds are especially effective in increasing their participation.

INTERVIEW QUESTION GUIDES

For motion graphics as an educational tool that supports learning English vocabulary by Chinese students

In-depth semi-structured interviews in phase 2 (part 1)

Greeting

Warm up

"How are you doing today?"

1. Introduce myself as the interviewer.

2. Explain to the participant about what we are going to do in this interview:

"This will be an approximately 1-hour interview where you will be invited to share your feedback on the experimental motion graphics teaching materials.

3. Confirm with the participant that they do understand the information sheet and willing to give his/her consent on this interview.

"All the detailed information have been written on the information sheet that I sent you before. Please allow me to emphasize again, the results of this interview will be anonymised, written up and submitted as a part of supporting data in the PhD thesis and may be used in publications. With your consent, the interview will be video-recorded. Once the recording has been transcribed and verified, the video-recording will be destroyed.

4. Answering any questions form the participant.

"Before you sign this consent form, do you have any questions about this interview? If you are understand and agree, could you please sign on the consent form for me, then we can start our interview."

*The above is the general flow of the interview, the details of which will be modified slightly according to the previous steps.

Discussion

"Firstly, I would like to know is how you think about these teaching material (motion graphics)."

The discussion will be generally led by the following questions (The final question will be modified based on the analysis of the observations):

Do you have any suggestions in terms of visual elements?
For example, in terms of colours of graphics, are there any inappropriate colour schemes or are some colours that might be more acceptable to students?

Are there inappropriate graphics or images that might lead to misinterpretation?

In regards to the design of the text, the colour, size and typography of the text, do you think there is anything that doesn't make sense?
Furthermore, do you have a specific choice of font style to use?

Can you share your thoughts on the animations that are now in the teaching materials? Either satisfied or dissatisfied.

Do you find anything incorrect about the photos used in the teaching materials? For example, it is not really appropriate to use photos for a certain part of the lesson, and graphics can be used instead, and so on.

Regarding the use of materials from textbooks, do you think that the way it is used now is reasonable? Please can you share your thoughts?

Is there any inappropriate movement of graphics, for example, is it too fast, or are characters or objects moving in an inappropriate way?

In terms of sound effects, would you consider them to be beneficial in helping students to understand the content? Perhaps there are situations where students are distracted by some sound effects or music?

When you are actually using this motion graphics in the classroom, do you have any suggestions for modifications in terms of manipulation, content progression?

These are pre-set questions and teachers can discuss the design of motion graphics according to their own teaching approaches.

*The above is the general flow of the interview, the details of which will be modified slightly according to the previous steps.

Ending

"Thank you very much for participating in this interveiw. The information you have provided has been very helpful.

Are there any questions that I can answer before we end the session?

Thank you again for your help. I really appreciate your time and your knowledge."

*The above is the general flow of the interview, the details of which will be modified slightly according to the previous steps.

Final themes, subthemes and codes

Final Theme 1: Impact of Multimedia Elements on Student Attention and Learning Outcomes

Promotion and Challenges of Interaction and Game Design to Student Focus
- Frequency of game usage needs moderate control
- Games used for proficient practice of key knowledge
- Game arrangement and sequencing
- Games improve student attention

Impact of Animation Design on Student Attention and Learning Outcomes
- Coordination between animation and explanation rhythm
- Animation dynamics may interfere with learning
- Animations can be slightly slower
- Animation is too fast
- Animations vary in their appeal to students
- Animations help rebuild focus
- Animation forms are limited to flat illustrations
- Complex animation effects lead to student distraction
- The number and direction of animations affect visual concentration
- Animation timing needs to be reasonable
- Animations used to relieve mid-lesson fatigue
- Animation playback
- Outdated animation style
- A reasonable animation rhythm helps students react synchronously
- Properly arranged animations improve focus in the later stages of class

Promotion of Cognition and Interest through Scene and Situational Design
- Pairing of scenes and characters
- Scene integrity enhances cognitive effects
- Students are more interested in familiar scenes
- Students focus more on scene content
- Scenario and background settings
- Replacing situational content to reduce distraction
- Situational images spark student interest
- Effective situational guidance enhances learning motivation
- Life-like scenes help student understanding
- Aligning visual elements with situational teaching

Application of Sound and Dubbing in Courseware
- Use of special sound effects
- Use of sound
- Scenes with sound accompaniment are more impactful
- Audiovisual effects match teaching content
- Conditions for using sound design in courseware
- Dubbing lacks emotional engagement
- Dubbing speed affects students' follow-along reading performance

Multimedia Elements (Images, Sound, Animation) for Classroom Fun and Understanding Support
- Image supplements support slower learners
- Adding images helps student understanding
- Adding images can prevent mental sets (fixed mindsets)
- Complex visuals lead to student confusion and distraction
- Multimedia tools enhance classroom fun
- Combined use of real-life photos and cartoons

- Guiding elements help students locate text
- Providing diverse input to promote cognition

Final Theme 2: Student Characteristics and Learning Needs

School Assessment Forms for Students

- Evaluating design methods

Student Perception of Visual Elements

- Students don't mind differences in art style much
- Students don't care much about character images
- Students focus more on visual effects than font types
- Students like cute images

Student Behavioral Characteristics and Classroom Reactions

- Inevitable that some seats cannot see the screen clearly
- Interaction makes the classroom more active
- Interaction design should highlight key content
- Use of familiar characters to spark interest
- Balance between student attraction and visual complexity
- Student preferences: Fun and interactivity
- Students like rich colors
- Students like interactive games
- Students like animation variety
- Students like real-life photos
- Students like funny content
- Familiar images liked by students change with trends
- Students like videos
- Students easily forget old content
- Students respond more to prior knowledge (old knowledge)
- Students have conditioned cognitive responses to images
- Students love it when teachers let them operate the PPT
- Students have short attention spans
- Content that triggers interaction is popular

Student Cognitive Support and Classroom Engagement

- Design optimization promotes overall class interaction
- Arrangement of design content
- Visual expression in courseware affects student cognition
- Courseware optimization improves student classroom engagement
- Step-by-step presentation helps with writing comprehension
- Design possibilities for key content
- Non-core elements easily trigger attention shifts

Impact of Familiar Visual Content on Students

- Learned content can reduce the need for dynamic effects
- Some teachers choose images familiar to students
- Familiar cartoon characters improve student attention
- Familiar scenes are close to students' life experiences
- Familiar characters may cause distraction
- The effect of familiar characters depends on their "discussability"

Direct Content Expression

- Communication with students should focus on being concise and direct
- Student reactions are intuitive
- Student thoughts and actions are also direct
- Student understanding is intuitive

- Visual content may lead to useless student discussions
- Sometimes picture usage triggers irrelevant student discussions

Teaching Strategies Adapted to Student Differences
- Differences exist in student abilities
- Primary school English classes rely heavily on teacher facilitation
- Flexible control to adapt to differences in student levels
- Instructional behavior teaching (modeling) is important for beginners

Final Theme 3: Teachers' Usage and Design Needs for Courseware
Appendix in PPT
- Usage and teaching tips in PPT
- Modification tutorials in PPT
- Deletion is a common modification method

Impact of Technical Equipment on Courseware Application
- Uniformity of teaching equipment affects courseware compatibility

Teachers' Attitudes and Capabilities in Courseware Use
- Operational complexity reduces teachers' willingness to modify
- Operational errors may lead to courseware damage
- Operational barriers affect courseware usage
- Teacher variability
- Teachers generally lack professional design skills
- Teachers adjust teaching content according to reality
- Teachers save time to focus on teaching
- Teachers' material selection is influenced by their own generational experiences
- Teachers don't know how to modify animations
- Teachers' feelings in class after using new designs
- Teachers prefer using cartoon patterns
- Page designs preferred by teachers
- Teachers hope the aesthetics of courseware content can be improved
- Teachers suggest keeping things as unified as possible

Teachers' Operational Preferences and Time Constraints
- Teachers don't have time for careful modifications
- Teachers' color usage preferences
- Teachers find it difficult to change some inappropriate patterns
- Courseware use needs to accommodate teachers with different experience levels

Continuous Automated Display vs. Step-by-Step Clicks
- Teachers want to control the animation rhythm
- Teachers have different operational preferences
- Automated displays can prevent students' thoughts from being disrupted
- Automated operations reduce the burden on teachers
- Auto-play makes it difficult to control speed
- Too many operational steps affect the user experience

Final Theme 4: Integration of Courseware Content and Textbook Resources
Integration of Textbook Resources and Courseware Content
- Retain and use original textbook images
- Textbooks have official font requirements
- Textbook images can be close to reality to enhance relevance
- Textbook design may be disconnected from students' actual interests
- Quality of accompanying videos for textbooks affects the teaching experience
- New devices are not as universal as PPT
- Old designs are unclear

Material Acquisition and Resource Limitations
- Video content is disconnected from the textbook
- It is difficult to obtain high-quality image assets
- Designers and teachers have different perspectives
- Design theory is different from teaching practice

Final Theme 5: Standards and Optimization of Courseware Design

Typography and Visual Design Standards
- Content providing tips for teachers can use a smaller font size
- Design suggestions for font size
- Font selection adjusts progressively with grade levels
- Basic fixed patterns for font color schemes
- Font color and emphasis techniques
- Font style has a relatively limited impact on learning
- Font style has a potential impact on understanding
- Small font sizes are usable provided the layout is clear
- Suggestions for local visual reinforcement
- Presentation methods are more influential than color
- Suggest not using green for fonts
- Irregular/stylized fonts affect students' handwriting imitation
- Teachers choose fonts based on student receptivity

Balance Between Content Volume and Teaching Rhythm
- Class time is sufficient for second-grade instruction
- Set aside time for active thinking during teaching
- Teaching task design needs to be diversified
- The quality of courseware affects students' engagement in class

Alignment of Courseware Visual Design with Teaching Content
- Background images are inappropriate
- Background colors affect text readability
- Color contrast determines visual visibility
- Visual and structural optimization improves the teaching experience
- The color of visual elements affects their attraction
- Visual elements need to express key points
- The suggestive role of visual content
- Visual attraction is effective for distracted students
- Visual diversity supports understanding and expression
- Visual focus management
- Visual design needs to balance content performance
- Visual design needs to closely match teaching content
- Adaptation of courseware difficulty
- Courseware color scheme design and visual perception
- Transition animations provide feedback
- Smaller font sizes are still acceptable but not ideal
- Page content density affects font size design
- Page style can be kept unified
- Colors do not necessarily need to be used in a certain way
- Color-layered design and character differentiation in dialogue
- Potential impacts of color
- The use of color has suggestive meanings
- The use of color has little impact in the short term

Standards and Optimization of Courseware Visual Design
- 28-point font is the acceptable baseline for screen reading
- Visual match to content
- Some old character images or patterns are inappropriate

- Different colors evoke different emotional feelings
- Colors not recommended for use
- Pay attention to character images
- Use visual content from the textbook
- Potential drawbacks of using real-life images
- Use visual elements to guide students' reading order
- Use consistent character images
- A large amount of information affects reading effectiveness
- Aesthetics can be more refined when content is limited
- Design of content presentation order
- Relationship between image citation and textbook activities
- Novelty of images affects attraction
- Image quality takes precedence over character popularity
- Images need to be integrated
- Both photos and cartoons aim to convey information accurately and effectively
- Difficulty managing layout with too many pictures
- Rounded or clear-lined fonts adapt to more viewing angles
- Seeking a balance between attraction and distraction
- Students will respond accordingly to familiar visual cues
- Teaching images do not need to cater to interest preferences
- Use of guiding icons in the visuals
- Character consistency and situational coherence

Simplicity and Operability of Courseware Design

- Functional positioning of title fonts
- Pay attention to character images (Note: duplicated in original)
- Pay attention to the quantity of animations
- Habit of full-page visual design
- White backgrounds enhance readability and layout freedom
- White backgrounds highlight text emphasis
- Simplicity affects teachers' willingness to use
- Streamlining text can increase content focus
- Red enhances visual focus and emphasis
- Design for structural clarity
- Suggestions for unified page layout

Interview transcript

The following are transcripts of the interviews, edited to remove translation errors and extraneous content, presenting the core dialogue:

Interview Transcript Teacher A

Interviewer: Researcher
Interviewee: Teacher A

Courseware Modification Discussion

Researcher: The changes to the courseware this time aren't actually that significant; it was mainly about updating the images. Since it's not yet in formal use, I wanted to get your thoughts on it beforehand, from a teacher's perspective.

Teacher A: Okay. Your main focus is on teaching research, not the teaching process itself, so this doesn't interfere.

Researcher: I didn't change the phonics section. Do you still teach phonics symbols now?

Teacher A: We don't teach phonetic symbols in elementary school anymore; we've switched to teaching

phonics through natural spelling.

Researcher: So, this section of content will still be covered in some way.

Teacher A: Yes. However, some teachers might skip this part. For example, if I've already taught it to the first-grade students, I might skip it, but I rarely do because a review is still necessary. Some teachers might not cover this part at all and focus mainly on the text and vocabulary.

Researcher: Do you think I need to modify this part as well?

Teacher A: Some teachers might not use this part. Because some of the content has already been learned in the first grade, second-grade teachers won't necessarily use it. So, it's not a problem if this part isn't changed. We are mainly focused on the main text content.

Courseware Interaction Design and Animation

Researcher: I haven't changed most of the interactive elements in the courseware, such as the snowing scene. Would you like us to brainstorm some new interactive methods together? I previously changed a "frog jump" interaction to "falling leaves" because the theme was seasons.

Teacher A: Changing the frog jump to falling leaves is great. It's good to make modifications based on the theme to make it more relevant to the season.

Researcher: Do you think the animation speed is too fast or too slow?

Teacher A: For some students, it might be a bit fast because they can't react in time to read the word. Of course, the teacher can adjust the speed, but some teachers might not know how. So, a little slower would be better, especially for second-grade students who can't keep up if the animation is too fast.

Researcher: In that case, do you think I should write detailed operating instructions in the courseware on how to modify the animation speed? I'm worried that if there's too much text, teachers won't read it.

Teacher A: You can include it; it's better to have it than not. You can write the modification path directly, like "Click the relevant graphic, then click on 'speed' to modify it." This way, teachers will understand without finding it too wordy. For some teachers who are less familiar with the operations, this guidance is very necessary.

Courseware Images and Visual Design

Researcher: I've tried to have the same main character appear in different scenes throughout the courseware. Do you think this makes it feel more coherent for the students?

Teacher A: Within the same courseware, using a consistent main character makes it feel more coherent for the students. But it's not necessary across different courseware because students won't remember the characters from the previous one.

Researcher: Regarding image styles, one is a "Q-style" with a larger head and smaller body, and the other is more realistic. Do you think these two styles would affect students' interest or understanding?

Teacher A: I don't think so. Students pay attention to the context of the picture, but they don't focus too much on the character's art style. As long as the colours are rich and the real-life scenes are strong and more direct than the previous design, students will find it more appealing.

Researcher: When selecting images, do we need to be careful to avoid character designs that are too exaggerated or strange?

Teacher A: Yes, as long as the designs are normal and cute, without strange expressions or revealing clothing, they are acceptable.

Courseware Content and Layout

Researcher: In an exercise for choosing the season, the original design had four options in four different colours. I was concerned this would give students a hint, so I changed them all to the same colour. Which do you think is better?

Teacher A: I think your modification is better. The original design indeed had a colour hint.

Researcher: Do you think there are enough pictures in this section? I'm thinking of adding a few more.

Teacher A: A few more pictures of different scenes would be better. This provides students with more contexts to choose from and guess which season it is, preventing them from developing rigid thinking

patterns. For lower-grade students, a variety of scene pictures helps them grasp the knowledge more firmly.

Researcher: Will adding more pictures take up too much class time?

Teacher A: No. This part is for reviewing vocabulary. A few more pictures allow students who react more slowly to participate and get practice. As long as it's not a dozen or twenty pictures, it won't take up too much time.

Courseware Operation and Flow

Researcher: Regarding the click operations in the courseware, do you think it's better for elements to appear automatically, or should the teacher have to click for each one to appear?

Teacher A: For parts that don't require student discussion, it's better to have elements like characters and dialogue boxes appear automatically. It's smoother and saves the teacher from frequent clicking. The focus should be on setting up click operations for parts that require students to choose or answer. My habit is to let things that can appear automatically do so before I speak, and then use clicks to bring up content when I or the students need to talk.

Researcher: When is it necessary to pause for students to have a discussion?

Teacher A: You need to pause when an interesting and eye-catching image appears that might spark their interest, like a picture with a lot of watermelons. They might discuss it then. But if it's just a character walking out, it won't attract them to discuss.

Courseware Background and Fonts

Researcher: Do you think it's better to use a white background for the courseware or one with some decorative elements?

Teacher A: It can be used according to the situation. In most cases, I prefer a white background because it makes it easy to adjust font colours and makes the content stand out. But for a page designed to look like a mock test, a test paper background would be more illustrative. As long as the background doesn't affect the clarity of the font, it's fine.

Researcher: Do you have any suggestions for the English font in the courseware?

Teacher A: I prefer to use the rounded, stick-like font from the textbook. Because this font is closer to handwriting, it's easier for students to recognize and imitate when writing, and they won't confuse 'a' with 'o'.

Researcher: As for font size, what size do you think is most appropriate?

Teacher A: Based on our classroom's screen size and clarity, a font size between 28 and 32 is quite suitable. Even the students sitting in the very back can see it clearly. Size 24 is also visible, but it's a bit small.

Video Animations in the Courseware

Researcher: Do you play the video animations included in the courseware in their entirety during class?

Teacher A: Yes, I do. These short animations are usually placed in the middle or later part of the lesson. On one hand, they serve as a break, and on the other, they can recapture the students' attention and boost their interest. For lower-grade students, you constantly need new methods to maintain their focus for 40 minutes.

Researcher: Do you find these animations interesting?

Teacher A: Some animations are indeed quite boring, and the quality of the voice-over is not high. It sounds computer-generated, emotionless, and sometimes the words are too connected, making it difficult for students to follow. So, much of the time, these animations are just used to grab their attention; it's hard for students to learn from them.

Use of Cartoon Characters

Researcher: Do you think it's better to use familiar cartoon characters (like Doraemon or Peppa Pig) in the courseware, or is it better to use generic little boy and girl characters?

Teacher A: I think using generic boy and girl characters is fine. It's not necessary to use their favourite

cartoon characters. Firstly, the cartoon characters that second-graders like now are no longer Doraemon and the like. Secondly, the sudden appearance of a familiar cartoon character is more likely to trigger discussions unrelated to the learning content. It's better to keep their attention focused on everyday life.

Interview Transcript Teacher D

Interviewer: Researcher
Interviewee: Teacher D

Researcher:
Hello, after reviewing the three sets of courseware, have you found any issues?

Teacher D:
Well, I think the font might need some changes.

Researcher:
The version I sent you might have had its font changed automatically by the software. I will fix this issue. Are there any other problems besides the font?

Teacher D:
I think the animations are quite well done, but regarding the background design, does it have to be this abstract style?

Researcher:
Not necessarily. Please feel free to offer any suggestions.

Teacher D:
Because I feel that some of the backgrounds might be a bit difficult for younger students to understand. They might not grasp the meaning of these abstract colour blocks. Personally, I think a stronger sense of a scene would be better, for example, using a complete picture as the background.

Researcher:
Does every page give you this impression?

Teacher D:
A few of them do. It's not a major issue, but I believe backgrounds with some real-life context would be better for the children.

Researcher:
Regarding the backgrounds, my design approach was this: in the introductory part of the lesson that sets a scene, I would use full-screen images with a strong sense of place. But when it comes to teaching new words or concepts, I switch to a white background to highlight the main content. This is because a teacher previously told me they prefer a white background for new lessons to avoid excessive decoration that could distract students. What are your thoughts on this?

Teacher D:
That approach is correct, but the backgrounds on a few slides aren't handled very well. For example, there's a page in the first lesson with an orange colour scheme, but there's a block of orange on the left, another on the right, a white stripe in the middle, and then the image you've paired it with is also multi-coloured. The overall effect is a bit busy.

My suggestion is, for pages with exercises, either use a consistent, scenic background image or design a clear layout. For instance, you could use a large white box to frame both the questions and answers, or have a box for questions on the left and another for answers on the right. This would be clearer.

Researcher:
Okay. What about pages with a plain white background? Do you think those are problematic?

Teacher D:
Personally, I almost never use a plain white background. When I create courseware, I feel that a coloured background, even a very light one, is better than plain white. Additionally, we tend to prefer a "page-turning" transition effect for our animations; it makes the progression from one slide to the next feel more cohesive and dynamic.

Researcher:
The transition effect I designed is a page-turning one. It might be a software issue that it didn't display correctly on your end. Also, I've noticed that teachers seem to prefer full-screen designs. Is that right?

Teacher D:
Yes, that's probably because the courseware templates recommended to us in the past were mostly full-screen, so we've gotten used to designing in that direction ourselves.

Researcher:
Have you ever observed which design style the students prefer?

Teacher D:
They generally like things with more animation and elements of fun.

Researcher:
But I'm concerned that too much animation might affect their concentration. For instance, if there's a tree constantly swaying on a page where you're trying to teach, would they just end up watching the tree?

Teacher D:
Yes, they would. So, my usual practice is to let the animation play out or manually pause it when I need to explain something. In other words, the animation can be active when it first appears, but it's best if it stops when the teacher starts speaking to avoid distracting the students.

Researcher:
Understood.

Teacher D:
Overall, I think the third lesson is very well done. The first lesson might need some slight adjustments; the colours feel a bit chaotic. The second lesson is predominantly orange, and the third is blue-green, both of which are good, but the colour palette in the first lesson isn't very unified.

Researcher:
That was intentional on my part. The original courseware I received didn't have a unified colour scheme, so when I was modifying the first lesson, I didn't focus on colour consistency, I just wanted to make it visually rich. For the second and third lessons, I decided to experiment with unified colour schemes to see if different palettes would affect the children's learning.

Teacher D:
If you really need to do a comparative study for your thesis, you can keep it as is. But if it's just for aesthetics, it would be better to make them all stylistically consistent.

Researcher:
Okay, I'll reconsider that. Also, in the second lesson, there's an exercise where I changed the original "connect the lines" task to "circle the word." Do you see any problem with that?

Teacher D:
No problem, these are just different ways of checking their comprehension. However, that page (page 35) could also use a little bit of a background colour or a border to make it less plain.

Researcher:
Do you have any suggestions regarding the use of images and character designs?

Teacher D:
Usually, when telling a story or presenting a scenario, it's best to stick to one or two main characters for consistency, unless it's an exercise that requires showing different people.

Researcher:
Yes, that's what I did in the first lesson, having the same girl appear throughout. But in the third lesson, there are three different people in three different scenes. Do you think they should be unified here?

Teacher D:
It's fine to have them separate here because the three scenes are not narratively connected, so using different characters works.

Researcher:
Okay. Let's look at the "hanging clothes" segment in the third lesson. Do you feel the animation is too complex, too slow, or that it requires too many clicks?

Teacher D:
It's fine, no problem there.

Researcher:
A previous teacher mentioned that during review sessions, they don't like having to click so many times

and would prefer the animation to autoplay quickly so students can just follow along. Do you prefer to control the pace yourself, or would you also prefer it to autoplay?

Teacher D:
I like to have the words presented so the students can see them. Perhaps the students in my class need more reinforcement, so I tend to display the words clearly to review with them.

Researcher:
What I mean is, do you prefer to click for each step, or have a single click trigger a complete sequence of actions?

Teacher D:
You could link the animations together. For example, after the previous animation finishes, the piece of clothing appears, the word follows immediately, and then they both retract together. That way, one click completes the sequence of showing the image, showing the word, and retracting them.

Researcher:
Understood. In what situations do you feel you need manual control, and when is autoplay sufficient?

Teacher D:
That probably depends on individual teaching styles and the class's level. Sometimes when I'm reviewing, the courseware autoplay, but some students haven't processed it before the animation moves on, and I have to go back. So, it really depends on the teacher's and students' needs.

Researcher:
In the "hanging clothes" part, I replaced the original Doraemon with a regular little boy. Do you think using well-known characters like that makes students more excited?

Teacher D:
It does, but I think it's fine to try a new character. Second graders now probably don't react as strongly to Doraemon anymore; I rarely hear them talk about him. Peppa Pig might still work for first graders, but second graders are quite "calm" about it. So, I don't think changing to a regular boy is a problem; it doesn't have a major impact. They get most excited when playing games.

Researcher:
In another segment about organizing shoes, I used a white background.

Teacher D:
You could actually set the background as a large wardrobe and have the children organize things inside it. That would create a stronger sense of a scene.

Researcher:
Okay. Regarding the colour schemes, do you think the orange and blue-green palettes in the second and third lessons are too dark or not colourful enough?

Teacher D:
No, they are very colourful. I think you can have your own design style; you don't necessarily have to cater to the idea of being "colourful" just for the sake of it. Sometimes a bit of contrast works better.

Researcher:
What about font size? I noticed in the original courseware, there were more than ten different font sizes within the same lesson.

Teacher D:
That depends on the layout and content. If there's a lot of content, the font will be smaller. Generally, dialogue is around 32-point, while individual words might be 60 or 70-point. The most important thing is that the overall screen looks harmonious.

Researcher:
But that means a single courseware file could end up with many different font sizes.

Teacher D:
Yes, when I make my own courseware, I just go with what looks good to the eye. Unless there are specific requirements, like for a competition or a formal presentation, there usually aren't strict rules about font size.

Researcher:
What I'd like to know is, to ensure the students in the back of the classroom can see clearly, what is the minimum font size you would recommend?

Teacher D:
At least 30-point.

Researcher:
Understood. And what about font colour? Besides black, white, and red, do you think it's necessary to use coloured fonts?

Teacher D:
I do use them. For example, in dialogues, to create a sense of hierarchy, I set the text for different characters in different colours. For instance, the girl's text could be one colour, and the boy's could be black.

Researcher:
Okay. From your experience, are there any colours that should be avoided on the classroom screen because they are hard to see?

Teacher D:
Yellow.

Researcher:
Okay. Also, in one exercise, I changed the original four coloured option boxes to four identical grey boxes to avoid any colour-based clues for the students. Do you think it's necessary to be this detailed?

Teacher D:
I agree with your latter point; as long as it's colourful and engaging, that's enough. You don't need to overthink it to that extent.

Researcher:
What are your thoughts on the animated video clips in the courseware?

Teacher D:
You mean the "Golden Sun" animations. They are old, but they are convenient and quite engaging. Since they are part of the lesson content, we have to let the students watch them, even if they are a bit long.

Researcher:
How do you feel about using real photos versus cartoons?

Teacher D:
Real photos are more related to daily life and can be clearer for certain exercises. However, I personally prefer to maintain a consistent style throughout the lesson. If I start with cartoons, I'll continue using cartoons.

Researcher:
Do you think students react with a different level of excitement to these two types of images?

Teacher D:
I don't think there's a big difference. Maybe the students in my class are calmer by nature. If you guide them, they will follow along. Their classroom response is generally quite moderate.

Researcher:
What about sound effects? Do you think they are necessary?

Teacher D:
You can add some sound effects when playing games, but they shouldn't be too loud or too frequent.

Researcher:
Okay, last question. You're currently teaching three classes. When you teach the lesson, would it be possible to arrange for two classes to use the new courseware and one class to use the old one for comparison?

Teacher D:
Yes, that's possible.

Researcher:
So, the assessment of teaching effectiveness will primarily be based on classroom observation and student reactions, correct?

Teacher D:
Yes, we'll see how they react in class.

Interview Transcript Teacher E

Interviewer: Researcher
Interviewee: Teacher E

Researcher: In this revision, I didn't change the courseware content, but mainly replaced the images, graphics, and some animation effects. After reviewing it, what are your overall thoughts?

Teacher E: Overall, it's acceptable. However, some pages, like pages six to ten, have a plain white background. If the entire courseware is meant to have a unified style, I think those could be modified as well. We almost always cover the content in this section.

Researcher: Do you think the animation speed needs adjustment? Another teacher mentioned wanting it to be a bit slower, worrying that students might not be able to react in time.

Teacher E: I think it could be a little slower. However, we don't necessarily get through every page in one class period, so if the speed you've set is similar to the original version, it shouldn't be a major issue.

Researcher: Do you have any suggestions regarding the character images in the courseware?

Teacher E: I noticed one of the male characters looks a bit scruffy; I'd suggest replacing him if possible. There's no need to worry too much about skin colour, but an image of a man with a full beard, for instance, is probably best left out of the courseware. That said, students usually don't notice such fine details.

Researcher: Do you prefer animations to play automatically or require manual clicking?

Teacher E: I personally prefer to click myself. I use a presentation remote to walk around the classroom, and manual control allows me to manage the pace better. But I also know many teachers stand right at the screen to click, so for me, either way doesn't make a big difference.

Researcher: Regarding pointing-and-reading, one teacher mentioned that the on-screen "little finger" icon feels redundant when they are also using their own pointer stick. What are your thoughts?

Teacher E: I think it's better to keep a "little finger" icon in the courseware. We need to teach students to point-and-read. The finger on the screen gives them a direct visual cue, letting them know what to read and reminding them to use their own fingers when reading their books. My students are already accustomed to seeing the finger icon as a signal to start reading along.

Researcher: On a multiple-choice page, I changed all four option boxes to a uniform blue to avoid any colour-based hints for the students. The original version had four different colours.

Teacher E: I think boxes with different colours are more effective at capturing their focus and concentration. In your revised version, the yellow question box is very prominent, but the four blue option boxes are less engaging. The options need to be distinct from the question. Also, some of the original illustrations were more appealing than the revised ones.

Researcher: In teaching, which is more effective: using real photos or cartoon images?

Teacher E: Each has its own advantages. Cartoons are more fun, while real photos feel more connected to daily life. There isn't a huge difference in student reactions.

Researcher: Do real photos tend to trigger unnecessary discussions among students?

Teacher E: Yes, their minds wander a lot. When they see a real photo, they might start discussing the person's facial expression or other details unrelated to the lesson. In contrast, cartoon characters might have fewer distracting elements.

Researcher: In what situations would using real photos be particularly effective?

Teacher E: Using real photos that are closely related to their lives can be very effective. For example, in a fifth-grade unit on directions, we used a map with real locations around our school. The students were extremely excited and engaged because it connected directly to their lives.

Researcher: Regarding page backgrounds, some teachers suggest using a plain white background when teaching key content to avoid distractions. What is your opinion?

Teacher E: When we create our own courseware, we pay a lot of attention to the page's aesthetic; a plain white background can look a bit monotonous. A design we quite like is to have colours or a border around

the edges of the page, while the central area with the core content remains white. This is both visually appealing and doesn't interfere with the content.

Researcher: Is it necessary to use different backgrounds for different teaching segments to distinguish them?

Teacher E: I don't think it makes a big difference, as the title of each segment is already different. We prefer to maintain a consistent page style throughout the entire PowerPoint for a stronger sense of cohesion.

- **Washing and Hanging Clothes Segment:** The colours of the shirt and pants that appear on the clothesline could be brighter; the current white and beige are a bit dull. Additionally, the animation for hanging the clothes could be simplified. Having the word and the item of clothing move to the clothesline together would reduce one click.
- **Use of Cartoon Characters:** Children today may not watch Doraemon much, but they get very excited to see characters like Peppa Pig or the currently popular My Little Pony. In the middle or later parts of a lesson, when students' attention starts to wane, strategically showing a beloved cartoon character can effectively bring their focus back.
- **Presentation of a "Messy" Scene:** There's a page meant to convey the concept of "messy." The original version showed shoes piled on the floor, which was very intuitive. Your revision places the shoes on a rack to the side of the page. While the shoe rack itself looks nice, this weakens the sense of a "messy" scene, and students might not grasp the concept. It's best to create scenes that are closer to real life, such as scattering the shoes on the floor.
- **Accuracy of Vocabulary Images:** One page uses an image of flip-flops to represent "sandals." This is not entirely accurate and should be replaced with an image of actual sandals.
- **Courseware Colour Tone:** The blue and green colour palettes in the third and fourth lessons are a bit dark and muted. For younger students, bright, vivid colours have a stronger visual impact, which better captures their attention and encourages them to listen more carefully.
- **Use of Textbook Images:** For segments that involve teaching content from the textbook, especially sections like "Story time," it is essential to use the original images from the book. This helps students connect the classroom lesson with their textbooks. For supplementary activities not directly from the book, feel free to use external images.
- **Sound Effects:** Unnecessary sound effects, like for page turns, can be removed. However, sound effects related to the teaching content, such as the sound of wind, rain, or thunder, should be kept as they aid in comprehension.

Researcher: Regarding font size, what range is most appropriate?

Teacher E: A font size of 28 or larger is generally fine. On our school's smartboards, students can basically see size 28 clearly. Size 32 is perfectly legible with no issues. The most important thing is to use a consistent font throughout the entire PowerPoint.

Researcher: Do teachers typically spend time modifying courseware, for instance, by adjusting animation speeds?

Teacher E: Older teachers might not be familiar with how to modify animations. In reality, for most teachers, as long as the courseware is usable and the content is correct, they rarely make changes themselves. At most, they might delete or skip a page they find unsuitable.

Researcher: In what situations, then, would you find it necessary to provide modification instructions?

Teacher E: If the courseware is intended for a competition or a public demonstration lesson, then providing a detailed instruction manual is very necessary. For courseware used in daily classes, however, I don't think it's as crucial.

Interview Transcript Teacher F

Interviewer: Researcher
Interviewee: Teacher F

Researcher:
Hello, first I'd like to ask, what are your overall impressions of using the new courseware?

Teacher F:
Well, the experience has been better. The students are more responsive, and the classroom atmosphere is livelier.

Researcher:
Is that so?

Teacher F:
Yes, it might be because the images, shapes, and other elements are richer, or perhaps the screen transitions are more natural. As a result, the second graders' reactions are much more engaged.

Researcher:
So, you're saying you feel the visuals are more engaging for them, is that right?

Teacher F:
Yes, the visuals are much richer than in the original version of the courseware.

Researcher:
There's one part (of the courseware) I didn't modify. Do you cover the spelling section in your class?

Teacher F:
Yes, when we use this courseware, we go over every page.

Researcher:
You cover every page? I ask because another teacher told me they skip that part, so I left it unchanged.

Teacher F:
We have enough class time, so we cover it.

Researcher:
Okay, so what do you think of the content in that (spelling) section? If I were to revise it, what changes would you suggest?

Teacher F:
Actually, I think the design of that section is very reasonable. We've already taught the related content and led the students through practice, so they are all able to sound out the words.

Researcher:
What about things like the animations? Are they too exaggerated? Or do the effects distract the children, making them just watch the animation and ignore the content?

Teacher F:
That's not a concern. In fact, for some of the boys who are usually less focused and tend to get distracted, seeing such rich visuals actually brings their attention back to the classroom.

Researcher:
Okay. Regarding the bubble (animation) part, do you feel the visual effects and their duration are too long? Or is the sound too loud?

Teacher F:
I didn't notice any issues with the sound. However, I do think the revised version is much smoother, and the time between each bubble is sufficient for students to read it out completely once. So, as long as I lead them through the first one, the whole class can read the rest together in a very rhythmic way.

Researcher:
Do you feel the timing and position of the bubbles are just right now?

Teacher F:
Yes, it's just right.

Researcher:
The next scene is about hanging out clothes. The original version used the character Doraemon, which I

felt might be inappropriate, so I changed it to a regular little boy. The original use of Doraemon was likely because children are familiar with him, but do children today still recognize Doraemon?

Teacher F:
They do recognize him, but I feel it actually negatively impacts my classroom discipline. The moment that slides appeared, the students started discussing it, and I had to stop the lesson to manage the classroom. So, your change was a good one; we don't need that many distractions.

Researcher:
Oh, I see. I originally thought using a familiar character would help them focus, but I didn't expect it would actually lead to unnecessary discussions. In your opinion, is using familiar characters sometimes helpful in teaching? Or is it unnecessary and just makes them overthink things?

Teacher F:
Well, there are positive examples. I remember some courseware designers liked to use Peppa Pig for introductions or to set a scene, and that worked well. That's because there isn't much to discuss about Peppa Pig. The children get excited when they recognize her, but it doesn't lead to as much discussion as Doraemon does. So, the choice of character needs to be handled with care.

Researcher:
Do you think that if these familiar characters were used in the middle or later parts of the lesson, when the children are starting to get tired, it might be a refreshing surprise for them?

Teacher F:
Yes, that's possible. In elementary school English class, the teacher has to maintain a high level of energy. Towards the end, even the teacher gets tired, and the students, after all the talking and clapping, also get a bit worn out and their energy wanes. So, introducing some interesting characters later on to re-engage their interest is a good idea.

Researcher:
The next section has a large vocabulary. Do you feel it takes too long, with too much clicking?

Teacher F:
No, it's actually a good opportunity to practice again. There are some words the students aren't very familiar with yet, for example, they often confuse "skirt," "shirt," and "shorts."

Researcher:
But there are 18 words in total. Do you find it tedious to operate?

Teacher F:
When using the new courseware, I found this review section a bit cumbersome. The animation effect is a bit long—a piece of clothing appears, slowly goes back, and then a new one appears. I think it could be sped up, or simply autoplay like the bubbles earlier. Since it's all content they've learned before, they will read it as soon as they see it.

Researcher:
So you're saying that the content that follows doesn't actually need to be manually controlled by the teacher?

Teacher F:
If it's new material, the teacher needs to control the pace, to be able to stop and lead the reading, have boys and girls read separately, or do group reading. But this is a review, so just giving them time to react is enough.

Researcher:
So, for the scene with the hanging clothes, do you feel the 'scenery' aspect is unnecessary, or that it can be kept but should be faster?

Teacher F:
It would be best if it could autoplay, without requiring us to click manually. It's tiring for the teacher to click every single time, and it's hard to maintain a steady rhythm. It would be more reasonable to have it as a preset animation at a faster speed, playing automatically like the bubbles.

Researcher:
Okay, I understand. So if it's not a new lesson but a review of previously learned material, it doesn't really need teacher control. You can just let it autoplay, and the students will follow along on their own.

Teacher F:
Yes, the review section of every lesson is like that. The food-related words they learned before also

appeared one by one automatically. The kids are already very used to this format.

Researcher:
Okay. In the next section, I changed the background to a more minimalist, plain white one. This is because one teacher told me that when teaching key vocabulary, you don't need too many decorative elements; a plain white background helps the key points stand out. However, another teacher felt that a sense of scenery helps children get more immersed. What are your thoughts?

Teacher F:
I prefer it to be more minimalist. This might be because the students in my class have shorter attention spans and don't need much of a scene. The new version you made, with just two or three shelves, is sufficient. They can associate it with a shoe cabinet and the need for sorting, and that's enough. The old version with the room background, the colour scheme was a bit chaotic. They couldn't process it that quickly, or they would easily get distracted by other things.

Researcher:
Understood. What about the logic of the visuals? For instance, the old version had shoes on the floor, while the new version has them flying around in the air. Do you think we need to consider the realism of such scenes?

Teacher F:
The students didn't question it when the new version appeared. I think both ways are fine; there isn't one "best" way. The main thing is the actual teaching effect. In class, besides teaching knowledge, we also have to maintain classroom discipline.

Researcher:
Can classroom discipline be affected by animations or visual design?

Teacher F:
Yes, it can. For example, if some visuals are too "explosive," or if a character they really love and who is highly discussable appears, they will start talking or making noise.

Researcher:
What would you consider "explosive"?

Teacher F:
For instance, there was a previous courseware about what to do in winter, and it showed a picture of "winter swimming." That class was very difficult to teach because the children's life experiences are so rich that they couldn't help but start discussing where one could go winter swimming.

Researcher:
As a courseware designer, do you think it's acceptable to modify this kind of content? Or should the official curriculum not be altered?

Teacher F:
It's fine if it's not changed, it just means we teachers have to spend more time managing classroom discipline.

Researcher:
Do you want them to have such discussions, or not?

Teacher F:
As a teacher, considering the progress of the whole class, I would prefer to remove that part. Not every student can quickly get back on track after a discussion.

Researcher:
So, you mean speculative topics like "swimming in winter" could be replaced?

Teacher F:
Yes, I think it could be replaced with something else. That topic doesn't really highlight any particularly necessary point about winter.

Researcher:
Okay, I see. Is the game section that follows complicated to operate?

Teacher F:
No, it's not complicated; we are very used to it. This game section is mainly for additional practice to reinforce their memory.

Researcher:
What do you think of the animation timing in this part? Is it too fast or too slow?

Teacher F:
I think the animation timing is fine. It's not too fast or too slow.

Researcher:
Generally, if the animation is too fast, the children can't keep up; if it's too slow, it drags down the pace of the entire class.

Teacher F:
Some of the old shared courseware had animations that were too fast during the food vocabulary section. The kids couldn't follow, and the next word would appear before they had a chance to review the previous one. We think a moderate pace is best. After a word is spoken, a pause of two or three seconds before the next one appears is about right.

Researcher:
Okay. So, as a teacher, do you modify the courseware yourself? For instance, by adjusting the animation speed?

Teacher F:
I usually don't modify the animations; it's too much trouble. If I feel a part is too tedious, I usually just delete that slide.

Researcher:
You don't modify it because it's too much trouble, or because you feel it's unnecessary?

Teacher F:
Mainly because it's too much trouble. Even if I feel something is not quite right, I won't go in and change it myself.

Researcher:
A previous teacher mentioned that they weren't very good at making modifications and suggested including a user guide within the courseware. Do you think that's necessary?

Teacher F:
I think providing operational tips is a good idea, but for making edits, any teacher with a little bit of IT knowledge wouldn't need that kind of guide. Unless they are much older teachers. However, having an extra tip is better than having none at all.

Researcher:
Okay. I also wanted to ask, do you use detailed lesson plans for your daily preparation? I mean the kind that specifies what to teach on each slide and what objectives to achieve.

Teacher F:
We do have lesson plans. For second grade, the lessons are relatively simple, so we just review the PowerPoint, and we know what to do. But for sixth grade, you definitely need a detailed lesson plan. For a demonstration class, a lesson plan can be over 6,000 words long.

Researcher:
So, the detailed lesson plans are written by the teachers themselves?

Teacher F:
Yes, but for the higher grades, each lesson actually comes with a corresponding lesson plan that is quite detailed. Of course, it's not as exaggerated as the ones we prepare for our own demonstration classes.

Researcher:
After these lesson plans for demonstration classes are polished, do they become shared resources?

Teacher F:
No. Because a demonstration class is not a regular daily lesson, so even if it's shared, other teachers won't use it for their classes. Besides, many large-scale demonstration classes now focus on picture book teaching, which is completely different from the regular textbook content.

Researcher:
I noticed in the notes section of the courseware you provided, you've written down the objective and process for each slide. Do you find it more convenient to have a separate Word document for the lesson plan, or to have it written directly in the PowerPoint notes like this?

Teacher F:
I much prefer your current method of putting notes right on the side. Everyone looks directly at the PowerPoint; very few people will read a separate lesson plan document.

Researcher:
Okay. Let's return to the courseware itself. For games like the spinner or darts, do you have any issues with the operation time or the graphics?

Teacher F:
No issues, they're fun to play. We could have more games; children love to play games.

Researcher:
How many games do you think is appropriate for one class session?

Teacher F:
There's no fixed number; it mainly depends on the purpose of the game. Games are usually used for consolidation after new material is taught, or at the beginning as a review.

Researcher:
So games are generally scheduled for consolidation after new content is taught, and they also help to boost their energy.

Teacher F:
Yes, but in practice, very few people put games at the very beginning, for fear that the students will get too excited right away. Putting them at the end, when they are getting a bit tired, and playing a game to wake them up, works well.

Researcher:
Do you have any feedback on the animated videos in the courseware?

Teacher F:
The video content itself is fine, but I think its placement could be adjusted.

Researcher:
Do you mean its position in the lesson sequence?

Teacher F:
Yes. It could be placed before the hand-clapping song, allowing students to watch it once to get the rhythm, and then they can follow along with the clapping and singing themselves. The effect would be better.

Researcher:
What about the animation itself? For example, its length or visual style?

Teacher F:
The duration is twenty seconds, which I think is even a bit short. The art style is indeed quite outdated.

Researcher:
Yes, it's all in the old "Golden Sun" style.

Teacher F:
I feel that since textbooks are for so many children, there's an obligation to elevate the aesthetic quality of the videos and illustrations, instead of still using this outdated style.

Researcher:
Indeed, the visuals, colours, and the way animations are presented all influence children's cognition and aesthetic development.

Teacher F:
Yes, the research you're doing in this area is very meaningful.

Researcher:
After using the new courseware, do you feel the overall classroom atmosphere and flow have become more natural and smoother?

Teacher F:
Yes, much more natural. Although there's no specific data to back it up, from an experiential standpoint, the flow of the entire session and the level of student participation were higher. Some students in my class who are usually "as quiet as a mouse" were very active this time, which was a pleasant surprise for me.

Researcher:
Okay. How do you assess their learning outcomes?

Teacher F:
We have a “fair-style” exam at the end of the term. In class, I mainly rely on observation. For example, during morning reading, I’ll see which group is the loudest and who is just faking it. Then I’ll communicate with the parents to have the child practice more at home.

Researcher:
So, based on your observations, can you clearly tell me that the modifications to the courseware were effective?

Teacher F:
Very effective. The students’ reactions exceeded my expectations. They were very lively without being overly boisterous, and the overall classroom response was excellent.

Researcher:
Regarding the fonts in the courseware, do you have any suggestions on size and colour?

Teacher F:
The standard size is usually 28-point. The principle is that it can be larger, but not smaller. As for colour, black and white are most common, with red used for emphasis. Our current screens have high resolution, so everything is generally clear.

Researcher:
Okay. One last question, regarding the use of real photos versus cartoons. In what situations do you think it’s better to use real photos, and when are cartoons more appropriate?

Teacher F:
I personally lean towards using cartoons exclusively. When children see real photos, they get very excited and tend to relate it to their own lives, which leads them to start sharing and discussing, and that disrupts the lesson.

Researcher:
But one teacher mentioned that when teaching “shopping mall,” for example, using a picture of a mall they’ve all been to helps them understand the word more deeply.

Teacher F:
Yes, the advantage of doing that is that they will definitely remember the word. The disadvantage is that it can trigger a lot of off-topic discussions and disrupt discipline. So, it has its pros and cons and requires a balance. If an idea is difficult to convey with a cartoon, then a real photo can be used.

Researcher:
I understand. What about using images from the textbook within the PowerPoint?

Teacher F:
When presenting the original sentences from the text, using the same images as the textbook is a very good idea. It helps students know where we are in the book. However, when teaching new vocabulary, it’s not necessary to use textbook images; otherwise, the whole lesson would be just those few pictures, and students would experience visual fatigue.

Analysis report of the REVIEW INTERVIEWS

General comments from teachers

1: The impact of design properties on student attention and learning outcomes

The promotion and challenges of game design on students’ attention

The use of games in the classroom serves two main purposes: 1) to introduce and import the content of the course and help students to concentrate; 2) it reinforces newly taught knowledge and enhances the classroom atmosphere in the later stages of the lesson. Games should not be used too early, as this may interfere with subsequent learning. The optimal timing is after new content is delivered, allowing games to consolidate knowledge while improving students’ concentration and engagement. The frequency of game

use remains moderate, depending on its instructional purpose. As Teacher F states, 'Sometimes a single game is enough for a given part... It's not about how many games, but about their function.' Games can be used to consolidate new knowledge or to help students become more proficient in certain key sessions.

The impact of animation and motion design on students' attention and learning outcomes

If motion effects are too frequent or continuous, they may distract students and cause them to miss the teacher's instruction. Motion effects should be simple and clear, avoiding overly complex or dramatic designs that could disrupt students' attention.

> 'As the little bird keeps flying around, students may get distracted during the lesson.' (Teacher A)
> 'When the slide is static but the images keep moving, this constant motion affects students.' (Teacher E)
> 'If kids see so many shoes flying around, they might feel it's too chaotic.' (Teacher F)

'The use of motion effects needs to strike a balance; they should express content in a concrete way,' (Teacher F) and should not move for too long. As long as the motion effect conveys its intended meaning, it achieves its purpose—there is no need for it to continue moving and risk diverting students' attention. On the other hand, if the motion is too complicated, students may lose interest in watching and become less focused. Additionally, the timing of the appearance and disappearance of motion effects must be well controlled to avoid interrupting the flow of the lesson. When used appropriately, motion effects enhance the classroom learning experience; however, excessive use can have negative consequences.

According to teachers, lower-grade students respond more slowly, so it is necessary to slow down motion effects to give them enough time to think and understand. The playback speed of motion effects needs to be properly controlled, 'not too fast and not too slow.' (Teacher F) If the motion effects move too quickly, students may fall behind and fail to effectively review or understand the information. Even though motion effects are dynamic, students may lose interest in some commonly used styles due to overexposure. Most motion effects always appear as two-dimensional transformations. Similar to interaction, motion effects can recapture and students' attention. 'It can boost interest—when explaining something, if a motion effect suddenly appears, students feel more excited.' (Teacher A)

As for animation, 'it is usually used more in the middle or later parts of the lesson. This is because those parts often involve activities where everyone listens, watches together, or follows a story… At that time, animation can help energize the classroom atmosphere.' (Teacher E) It is recommended that animation clips last at least 20 seconds to better capture and maintain students' attention. Teachers also note that the current animation styles appear outdated and need to be refreshed in order to improve visual impact and increase student interest.

The promotion of cognition and interest through scene and context design

Using different scenes and character variations helps students better understand vocabulary meanings and enhances their perception of key concepts.

> 'A stronger overall visual impression works better.' (Teacher A)
> 'If the context is reasonable, students learn more effectively.' (Teacher E)

Students show more interest in familiar real-life settings and tend to react more active: 'For example, if a supermarket appears in the image, one they know, they'll say, "Oh, I've been there", and that definitely leaves a strong impression.' (Teacher F) In addition, students tend to focus more on the overall scene in the image rather than on the appearance of individual characters.

Application of sound and voice-over in instructional materials

Teachers emphasise that audio and visual effects must closely align with the teaching content. For example, 'if it's raining, there should be a soft "pitter-patter" sound; when it's windy, a "whooshing" sound can be added. By that, children can both see and hear.' (Teacher E) During games, sound effects may be

added in moderation, but the volume and frequency must be well-controlled to avoid disrupting the lesson plan. Currently, teachers identify poor-quality audio recordings and lack of emotional expression as major issues affecting student learning. Since recordings are computer-generated, the speech often sounds flat and unnatural, making it difficult for students to follow along with the videos. It is also important to control the reading speed in recordings: ‘Sometimes it’s so fast that the children simply can’t keep up.’ (Teacher A)

Regarding the use of voice-overs, teachers believe ‘not every sentence needs to be voiced.’ (Teacher F) Voice-overs should be selectively applied based on instructional needs. For newly introduced vocabulary, it is best to include human voice recordings, which serve as listening practice for students. Alternating between different audio sources (e.g., recorded voice and teacher explanation) helps maintain student attention and encourages active listening.

Audio is mainly used in videos and vocabulary presentations during new instruction phases, and should not be inserted too frequently in later stages to maintain a clear and efficient lesson flow. Certain playful sound effects, such as knocking or explosion sounds, can boost student engagement and even prompt imitation, increasing classroom interaction:
‘For example, with sounds like knocking or explosions, some children want to imitate them.’ (Teacher F)

Use of multiple design properties to enhance classroom engagement and understanding

The appropriate use of images helps enhance students’ understanding of lesson content. Diverse visual expressions not only reduce cognitive fixation (i.e., prevent students from interpreting a word only within a specific context), but also enrich the learning experience. At the same time, image complexity should be well controlled. Overly complex visuals may cause confusion or distraction, especially for lower-grade students whose attention spans typically last only around 10-20 minutes. To maintain engagement throughout a forty-minute lesson, rich yet moderate visual stimuli (such as animations and videos) are necessary to continually arouse students’ interest. As long as the multimedia materials align well with the instructional content, teachers are generally positive about applying them to support teaching and learning effectiveness.

Regarding the selection of image types:

- **Cartoon images** offer strong entertainment value and effectively attract students’ attention.
- **Real-life images** provide a sense of authenticity and help students build practical understanding.

Besides, flexible alternation between image types allows adaptation to different teaching goals, and substitution of real-life images is encouraged when cartoon illustrations are insufficient for comprehension.

During the interviews, teachers also highlight the importance of variety in practice activities. They believe that using different types of exercises helps students understand knowledge from multiple perspectives and supports the development of divergent thinking. Varied formats (such as illustrated questions, multiple-choice items, or dialogue-based tasks) can increase students’ focus and participation, as a new format is a kind of stimulus that arouses curiosity. However, the level of variety must be carefully managed. When activities are too repetitive, students may become bored and disengaged. On the other hand, excessive variation may lead to cognitive overload, making it difficult for students to adapt quickly and potentially confusing new knowledge. Teachers suggest offering students diverse forms of expression while ensuring that understanding the lesson content remains the priority. The variation in practice activities should be implemented through use of different design properties to reflect the intended diversity.

2. Student characteristics and learning needs

Direct content communication

Teachers emphasize that the most important aspect of communicating with students is being simple and direct. Students tend to think and respond in an immediate and intuitive way. Therefore, the most efficient

way to convey information is to reduce the amount of implied, indirect content, and the most intuitive expression will be the most effective. The clearer and more direct the expression, the more efficient the information delivery. Students' immediate reactions can also serve as a reflection of whether the design and messaging are effective.

On the other hand, students' thinking is divergent, and various visual elements can easily trigger unnecessary discussions: 'like on page 32, when talking about food, if they see a real person eating ramen, …they get fixated on the person's facial expression and start talking about unrelated things, like saying "that person is smiling".' (Teacher E) Sometimes when this happens, it's harder for students to get their attention back to the lesson.

The impact of familiar visual content on students

Teachers believe that using familiar cartoon characters, such as Peppa Pig, can more easily capture students' interest, as students feel a sense of familiarity. However, not all cartoon characters (e.g., Doraemon) appeal to the current generation of students. In contrast, contemporary popular characters tend to evoke stronger excitement and engagement. Teachers especially highlight that while various cartoon characters are often used in different designs, the ones selected by creators in the current teaching material are not always aligned with what is trendy or well-known among students. As a result, students may not recognize or feel connected to them, leading to less enthusiastic reactions.

When students become distracted, introducing familiar and popular cartoon characters can quickly recapture their attention. However, teachers also caution that while familiarity can boost attention, it may also lead to distraction. The emotional attachment students feel toward these characters can provoke off-topic conversations or disruptive behaviours—for example, discussing the character's personality, voice actor, or background story—which may affect classroom discipline and interrupt the teaching flow. Sometimes, teachers even have to pause the lesson to redirect students' attention.

Cartoon characters should be naturally integrated into the lesson content without disrupting the pace of the class. Additionally, teachers emphasize that character visuals in slides should not only feature a cute cartoon style but also include appropriate facial expressions, clothing, and contextual relevance.

During the interviews, teachers introduced a new insight regarding familiar visual elements. They note that students often associate recurring visuals—especially those used in interactive segments—with specific classroom activities. For example, when students see a spinning wheel, they immediately expect to play the wheel game. When a particular character appears, they instinctively prepare to engage in a follow-along reading activity.

Students' perception of visual elements

Students generally do not react strongly to the differences in illustration styles within one PowerPoint, but certain changes in style may arouse their interest. They are also not particularly concerned with the specific illustration styles of human characters. However, teachers highlight that when unusual or distinctive character designs appear, they can trigger unnecessary discussions among students. When it comes to using cartoon characters, teachers believe that students typically prefer a cute appearance (childish style), so most cartoon-style characters are likely to be well-received. Regarding the font style, although students may not consciously distinguish between different fonts, they do react when a font is hard to read or visually unappealing.

3. Student-preferred (highly responsive) modes of interaction

In the Phase 1 interviews, teachers mentioned that students respond actively to motion graphics that provide feedback for their action, describing it as a highly engaging format of interaction. In this interview, teachers highlighted another popular interactive method—allowing students to control the motion graphics

themselves. For example, students can tap on images during a picture-word matching activity to trigger motion effect on the screen, which greatly enhances engagement and participation.

4. Teachers' needs for use and design of motion graphics

Continuous auto-display & step-by-step clicking

The automatic and continuous display of motion effects helps prevent students from becoming distracted due to interruptions: 'If we click every time, students may lose focus if they can't keep up with the teacher's pace. But if the display rhythm is pre-set, like showing one word in every few seconds, students will follow along like singing.' (Teacher F)

Teachers indicate that too many clicking steps often disrupt their teaching flow. They suggest setting frequently used content, such as vocabulary, dialogue boxes, or image movements, to appear automatically or play in sequence. This allows smoother lesson delivery and reduces the teacher's operational burden, especially during review sessions or when presenting previously taught content:

> 'There are too many clicks. Can it just be set to pop up a word automatically, so I don't have to keep clicking?' (Teacher E)
>
> 'The operation becomes smoother. I just click once, and the items appear in sequence.' (Teacher F)

For motion effects, teachers recommend designing them to occur in a connected sequence at a reasonable pace, such as: image appears → word pops up → element fades out, creating a flow of content presentation. However, when teaching new content, teachers prefer to retain manual click control to better manage the pacing: 'if it's fully automatic, I can't control the speed.' (Teacher F) Overall, simplifying operation supports both student understanding and teacher control, although preferences may vary depending on individual teaching styles.

'Notes' section in PowerPoint

In Phase 2, interviewed teachers note that although modification instructions are provided in appendices or teaching plans, these tips are particularly helpful for those less familiar with technical operations. Clear and straightforward editing paths are preferred, as 'too much information can be confusing.' (Teacher F) However, due to heavy workloads and limited time, teachers remain reluctant to edit PowerPoint, and modifications are still relatively rare. The most common method is deletion—teachers often simply remove unsuitable content:
'teachers usually skim through the PowerPoint before class and then teach. Few teachers actually read the lesson plans in detail.' (Teacher F)

5. Specification of the visual design of text

Teachers believe that using font size 32 for dialogue text is generally readable and being a commonly accepted standard. The minimum recommended font size is 28, especially to ensure clarity for students seated at the back of the classroom. With the support of new high-resolution display equipment, more flexible font size variations can be achieved. Larger font sizes can be used for keywords or titles to enhance visual emphasis. For teacher prompts or subtitles, smaller fonts may be acceptable as long as they remain legible: 'Font size can be smaller, size 24 is still readable, as long as the screen isn't too cluttered.' (Teacher A) Font size should be adjusted based on the setting and equipment.

Regarding font colour, teachers consistently recommend black for white or light backgrounds due to its clarity and readability. White is suitable for use on dark or colourful backgrounds to maintain

contrast. Green is discouraged, as it tends to be unclear on screens. Red is widely used to highlight key words or important information:

> ‘Red makes important content stand out and grabs attention.’ (Teacher A)
>
> ‘We use red for the main points… it’s like underlining with a pen.’ (Teacher E)
>
> ‘Red is already the most visible.’ (Teacher F)

While teachers are open to other highlight colours, red is preferred due to both visibility and comment use, students are already accustomed to associating red with key content.

Phase 2 (REVIEW INTERVIEWS): detailed description of specific design guidelines

After the review interview, it is found that teachers not only repeat points consistent with the previous insight interview but also provide new design suggestions based on Prototype 1, which lead to new design insights. In addition, teachers raise objections to some designs and offer suggestions to modify existing design insights.

The following lists the revisions to the design insights based on the review interview, organised by the content of each design insight:

Topic 1: (3) Visual accuracy and support for interactive activities, maintain voluntary attention

Regarding the speed of motion effects, the teacher interviewed re-emphasised: lower-grade students need more time to respond and to slow down the speed of motion effects to give enough time for comprehension. Too fast effects can result in students not being able to keep up and not being able to review and understand effectively.

For motion effect speed, more specific design considerations include:

- For lower-grade students, motion effects should closely relate to the lesson content.
- When students need to recognise and read words while the effects are activating, the motion speed should slow down to ensure enough reaction time.
- Motion effects that are too fast may affect students’ visual recognition and pronunciation accuracy.

- A single motion effect lasting about 3 seconds is acceptable, but further slowing down is possible. A duration of 3–5 seconds better fits lower-grade students' information processing pace, helping maintain attention and supporting effective interactive activities.

Topic 1: (4) Reducing florid expressions for new content instruction

In new knowledge instruction, it is recommended to simplify the design of motion graphics. Specific suggestions include:

Decorative elements and backgrounds

- Use white backgrounds more, as white is easy to adjust and improves reading clarity.
- Appropriate decorative elements can reinforce visual cues and help students distinguish different content sections.

An optimized background not only improves aesthetics but also visually signals different teaching stages. For example, changing the background when moving to a new section or practice format acts as a non-verbal and visual cue, adds freshness, and helps maintain classroom pacing.

- For slides focusing on scenarios with less explanation, richer backgrounds and decorations create an immersive atmosphere.
- For slides where students need to read questions or complete exercises, minimize decorations to avoid distraction.

Overall, the design should place decorative elements around the slide edges to ensure the central content area remains easy to read.

Avoid non-essential motion effects:

- Overly frequent or persistent motion effects can be distracting to students.
- Motion effects should be kept simple and clear, avoiding complexity and exaggeration.
- Motion effects should be designed to convey specific content and should not last too long.
- The timing of the appearance and disappearance of motion effects should be controlled to avoid interrupting the rhythm of the class.

Topic 1: (5) Support interactive activities, enhance voluntary attention

In the middle to later part of the lesson, the practice of new knowledge takes in interactive activities. Further design insights include:

Diversity of activities

- Diverse practice formats help students understand knowledge from different angles and promote divergent thinking.
- Multiple question types (e.g., picture-based questions, multiple-choice, dialogue tasks) increase student focus and engagement; novelty itself acts as stimulation.
- Balance is necessary:
- Excessive repetition leads to boredom.
- Too much variation increases cognitive load and hinders new knowledge absorption.
- Design centres on content understanding, flexibly using various design elements to reflect diversity.

Implementation considerations

- Using 2–3 types of interactive formats per practice section is appropriate to avoid confusion and overload.
- When repeating an interaction type, adding new elements or variations helps prevent fatigue.

Notes:

- Moderate variation attracts attention and stimulates interest.
- Excessive variation causes cognitive overload and weakens instructional coherence.
- Appropriate innovation in repetition maintains freshness and engagement.

Student preferences for interaction

- Action-feedback motion effects: Students respond positively to motion effects that provide immediate feedback on their actions, significantly enhancing attention and engagement.
- Voluntary control motion effects: Allowing students to control effects (e.g., clicking to trigger effects in picture-word matching) effectively increases classroom interaction and participation.

Among different interactive activities, games are commonly used, with more detailed design insights on games:

Role of games in the classroom

- Used in the later part of the lesson to consolidate new knowledge and

energise the classroom atmosphere.
- Games help students master key points more proficiently.

Timing of game use
- Avoid using games too early to prevent interference with new content learning.
- It is to better use games after teaching new content to reinforce knowledge and increase focus and engagement.

Frequency of use
- Schedule games according to teaching goals.
- The quality and function of games matter more than quantity.
  One game per teaching section may be sufficient.

Topic 1: (6) Maintaining two facets of attention

In the later part of the lesson, video clips/animations can be used again to regain students' attention.
- Animations are used in the late stages of the lesson, combined with group viewing or storytelling to enliven the classroom atmosphere.
- Animation length is recommended to be at least 20 seconds to help capture and sustain students' attention.

Topic 2: Motion graphics and situated learning in the classroom

The application of situational learning methods in classroom suggests that motion graphics use strong visual expression to present a scenario. For scenario construction, more specific design considerations include:

Role of diverse scenarios and characters

Different scenarios and character changes help students understand vocabulary meanings and reinforce core concepts.

Application of diverse visual expressions
- Using multiple visual expressions for the same content (e.g., presenting the same vocabulary with different images or scenes) helps build a more comprehensive cognitive framework.
- The effectiveness of visual expressions depends not only on quantity but also on their arrangement and timing within the class flow.

Adjustment of visual expressions by lesson sections

- Practice phase: students have a basic understanding and process information faster; more diverse visual expressions deepen comprehension with minimal impact on teaching time.
- New instruction phase: students encounter new content for the first time and need more time to process visuals; excessive or complex visuals may disrupt teaching rhythm and classroom flow.

Design considerations

- Flexibly adjust the amount of visual expression according to class sections and student comprehension, reducing visuals when necessary to ensure teaching.
- Designers should prepare multiple visual options for teachers to select from, better adapting to different teaching scenarios.

Consistency between content and visuals

The clearer the correspondence between content and visuals, the more intuitive and easier it is for students to grasp word meanings and usage.

Realistic and contextualised scenarios

Designs lacking contextual clues can confuse students about the scenario in which the objects are located and used, thereby affecting their understanding of the meanings of vocabulary. It may weaken the connection between vocabulary learning and students' real-life experiences.

Visual design and contextual expression

- Strong overall visual coherence of the scenario is preferable.
- Reducing abstraction in contextual expression makes learning more effective for students.
- Students show greater interest and positive responses to familiar real-life scenes.
- Integrating the local cultural scenario makes vocabulary meanings more relevant and easier for students to accept.

Visual focus

Students tend to focus more on the whole scenario rather than on individual characters

Integrate local cultural elements

Incorporating the local culture of the region into the situated learning is a design method that is highly recognised and encouraged by teachers.

- Adding local cultural elements and reflecting the familiar living environment of students make the semantic expression of vocabulary closer to reality and easier to accept.
- By choosing scenario that are closely related to students' daily lives, it can better help students understand the vocabulary.

Realistic and contextualised scenarios

Teachers emphasised that rather than relying on cartoon characters, it is more useful to guide students to associate them with real-life, and that understanding vocabulary through more realistic scenarios is more useful to help achieve the teaching objectives.

Scenarios that lack contextual clues can confuse students about the environment in which the item, the vocabulary refers, is located, thus affecting understanding of the meaning of the vocabulary.

Incomplete scenarios may weaken the connection between vocabulary learning and students' real-life experiences.

Topic 3: Graphics and photos in visual expression

- Students' divergent thinking can lead to off-topic discussions triggered by graphics or photos. For example, when discussing food, if a real person eating noodles appears, students may focus on the person's facial expression and get distracted from the teaching content.
- The use of images helps students to understand the content and enriches the learning experience.
- A variety of visual expressions can reduce students' fixed perceptions of vocabulary.
- The complexity of patterns and content presented in pictures should be controlled.
- The complexity of the graphics and content presented in the pictures should be moderated, as too much complexity can confuse or distract students.

Graphics or photos

- Graphics: entertaining and effective in attracting attention.
- Photos: strong sense of reality, helps to build practical understanding.
- Flexible switching of expression types helps to match different teaching

objectives; when graphics are not capable of expressing in detail, it can be replaced with photos.

Topic 4: Instructions for modifying motion graphics

PowerPoint ‘Notes’ section and teachers’ attitudes towards modifying:

- The instruction in ‘Notes’ section and lesson plans are helpful: particularly useful for teachers who are technologically unfamiliar, and clear and concise editing guidelines are preferred to avoid too much information leading to confusion.
- Teachers still have low willingness to revise PowerPoints: due to heavy workloads and time constraints, teachers are generally reluctant to make PowerPoint edits.
- Teachers usually skim through the PowerPoints quickly before class rather than reading the lesson plans in detail.

Topic 5: Visual cues and visual consistency

Simplify animation effects and reading cues

Adding a ‘little finger’ icon as a visual cue in reading activities helps guide students to read content in order more effectively. This has become a familiar reading prompt for students. If only characters and speech bubbles appear, students may not clearly understand that it is a reading task.

Characters as visual cues and differentiation

The use of different characters in different sections may provide contextual ‘cues’ to students. Reinforcing teaching sections differentiation through characters

When characters serve as cues and convey instructional intent, their roles must be visually recognisable. For example, characters must be clearly distinguishable by design, such as clothing, pose, or the contextual cues may become blurred.

Uniformity of characters

Uniform roles are used in the same lesson or teaching section to enhance the continuity of the content and to aid student understanding. However, there is no need to insist on role uniformity between different lessons, as students may not remember the roles from the previous lesson. Therefore, the use of consistent

roles within the same lesson contributes to a sense of continuity, while cross lesson can be flexible.

Topic 6: Intuitiveness of visual expression

Keep the visual expression and information simple, avoiding the introduction of details that can easily trigger over-associations, so that students can focus on what they are learning.

The clearer the correspondence between the content and visual expression, the more intuitive and understandable the students' grasp of the meaning and usage of the words.

Topic 7: The impact of familiarity

Effect of familiar visual content on students

- Familiar characters stimulate interest: using familiar cartoon characters (such as Peppa Pig) more easily attracts students' attention and arouses their interest.
- Match with students' popular preferences: when cartoon characters do not match what students know or find popular, students may not recognise them, feel less engaged.
- Distraction and Classroom Control: familiar characters can quickly regain students' attention when they are distracted, but the characters may lead to off-topic discussions, such as about the character's personality, outfit, which can affect classroom teaching and sometimes require a teaching pause for guidance.
- The conditioned reflex effect on familiar elements: students will associate recurring visual elements with specific activities.

Topic 8: Text

Text size:

- Dialogue text uses size 32pt, which is generally considered readable and a common standard.
- The minimum recommended size is 28pt to ensure students in the back row can see clearly.

- With high-resolution displays, font size can be adjusted flexibly.
- Keywords or titles can use larger sizes to enhance visual emphasis.
- Prompts or subtitles can use smaller sizes (such as 24pt) if they remain clear and do not overcrowd the layout of slide.

Text colour:
- Black is recommended for light backgrounds because it is clear and readable.
- White is suitable for dark or coloured backgrounds to maintain contrast.
- Green is not recommended because it easily appears blurry on screens.
- Red is still recommended to be used to highlight keywords or important information; it stands out visually, and students are used to associating red with key points. Other highlight colours are acceptable, but red is preferred for its visibility and familiarity.

Topic 9: Colour
- Colours can unintentionally guide or mislead students' understanding. Younger learners are especially sensitive to the implied meanings of colours. Therefore, when the goal is to encourage independent thinking, it is crucial to avoid visual colour cues that may suggest a 'correct' or 'preferred' choice.
- A variety of colours often works better to attract and sustain attention. A single, strictly unified colour scheme is not always necessary or effective for this age group.
- Colour strongly affects the perceived importance of elements. Designers should ensure that contrast is used deliberately so that non-essential elements do not stand out more than key content.

In addition, in the review interview, the participating teachers did not raise any significant objections regarding the test attempts and corresponding design applications described in Section 7.2.

Based on the above, the researcher developed the following test attempts in PROTOTYPE 2:
- Maintain the test from PROTOTYPE 1 that applies different colour schemes for different lessons.
- Incorporate design modifications to remove potential colour cues from the corresponding slides, in order to test whether such cues have any impact on teaching effectiveness.

Topic 10: Sound

Use of sound and voice-over

Sound effects should align closely with visuals:

- Match sounds with teaching content to create an integrated audio-visual experience.
- Game elements can include sound effects, but volume and frequency should be controlled to avoid classroom disruption.

Common issues:

- Poor audio quality and lack of emotional expression can hinder student learning.
- Computer-generated voice-overs often sound monotonous and unnatural, making it hard for students to follow.
- Reading speed must be controlled; overly fast narration can cause students to fall behind.

Using voice-overs:

- Not every sentence requires a voice-over, apply selectively based on teaching needs.
- New vocabulary is best recorded with real human voices to provide authentic listening input.
- Alternating between different audio sources (e.g., recordings and teacher explanation) can help sustain attention and promote active listening.

Timing and purpose of sound effects:

- Audio is most effective in videos and during new vocabulary introduction; its use should be reduced in later stages to maintain a streamlined, efficient lesson.

The following are the supplementary design insights from the REVIEW INTERVIEWS:

Supplementary topic 1: Motion Effects Trigger Controls

Design strategies:

Differentiate effects Triggers Based on Instructional Function

- Use automatic appearance for procedural or contextual content such as background information, slide transitions, character entrances, or non-

essential dialogue. This supports smoother classroom flow and minimizes teacher workload.

- Reserve click-triggered effects for critical instructional moments, e.g., student answers, teacher explanations, or key interaction prompts, to enhance engagement and control.

Avoid Unnecessary Clicking to Simplify Teaching Operations

Motion effects that do not serve a direct instructional function should not with the click-trigger, so as not to increase the complexity of the teacher's operation and interrupt the rhythm of the classroom.

Align motion effects Flow with Teacher's Instructional Rhythm

The sequencing of effects should match the speech and teaching rhythm. For example, display background context automatically, then reveal student responses or key content via clicks to maintain coherence and clarity.

Clicks for Instructional Emphasis

Click-trigger should mostly be used when teacher intervention, focus, or explanation is needed. This reinforces the pedagogical hierarchy and prioritizes essential content.

Supplementary topic 2: Slide Transition Effects

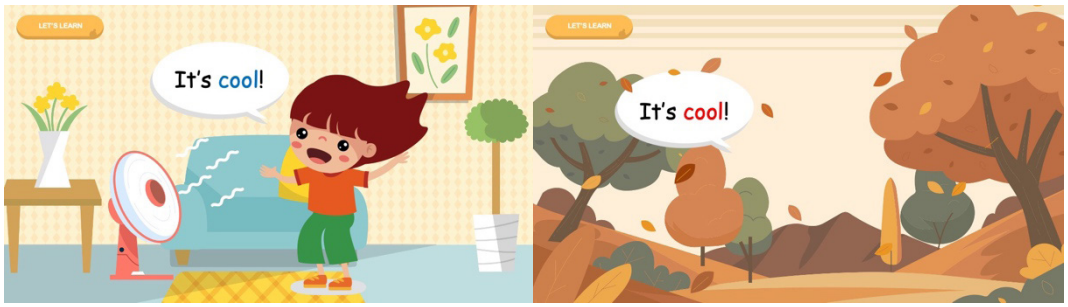
- Adding slide transition effects enhances overall visual coherence and viewing experience.
- Transitions that align with content changes strengthen the unity between content and display format.

PROTOTYPES 1 & 2

Design Prototypes 1 and 2 are based on the same current teaching materials (Grade 2, Semester 2, Unit 6), therefore they are presented together here:

Lesson 1:




LET'S LEARN
It's cool!

LET'S LEARN
It's cool!


LET'S LEARN
It's very cold!


LET'S LEARN
Oh! It's warm!

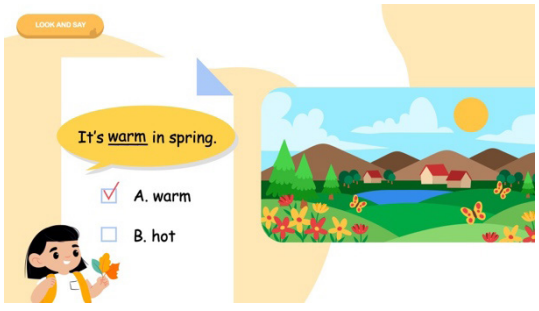

LET'S LEARN
It's warm.

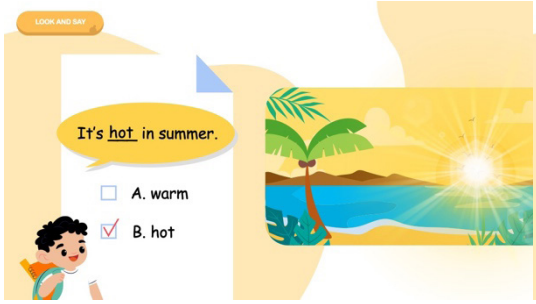

LET'S LEARN
Wow! It's warm.

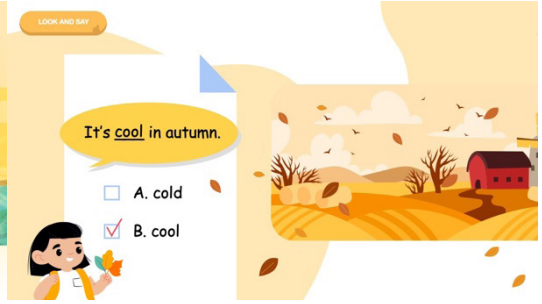

LET'S LEARN
spring

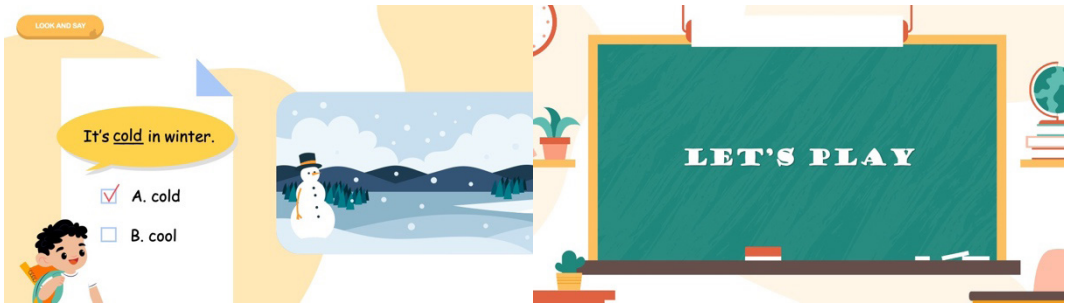

LOOK AND SAY
WINTER


LOOK AND SAY
It's ...
spring
summer
autumn
winter


LOOK AND SAY
It's warm in spring.
A. warm
B. hot


LOOK AND SAY
It's hot in summer.
A. warm
B. hot


LOOK AND SAY
It's cool in autumn.
A. cold
B. cool


LOOK AND SAY
It's cold in winter.
A. cold
B. cool

LET'S PLAY


LOOK AND SAY
Come and look at my pictures.
It's winter.
You're ___making a snowman_____.


POINT AND READ
It's spring.
You're fishing.

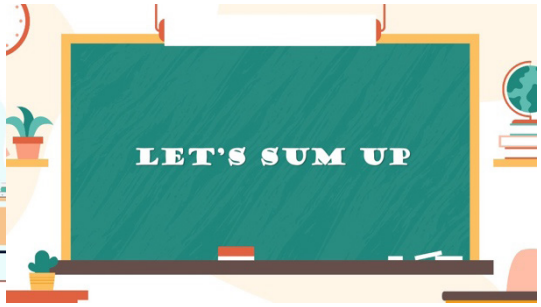

POINT AND READ
It's summer.
You're drinking coke.


POINT AND READ
It's autumn.
You're flying kites.


POINT AND READ
It's winter.
You're making a snowman.


READ AND DO


LISTEN AND DO
听录音，做动作。


LET'S SUM UP


学习小结
1. 我们知道了 w says /w/。
/w/
学习小结
2.我们学习了四个季节的单词：
spring
summer
autumn
winter

学习小结

3.我们学习了两个形容天气的单词和一个活动的短语：

warm　cool

make a snowman



学习小结

4.我们学会了描述不同季节天气的句型：

It's warm in spring.



学习小结

5.我们表演了 P55的内容：





课后听说读

1. 完成《快乐识词》P96-P98的内容。

2. 和朋友们一起朗读课本 P54-55的内容。





课后听说读

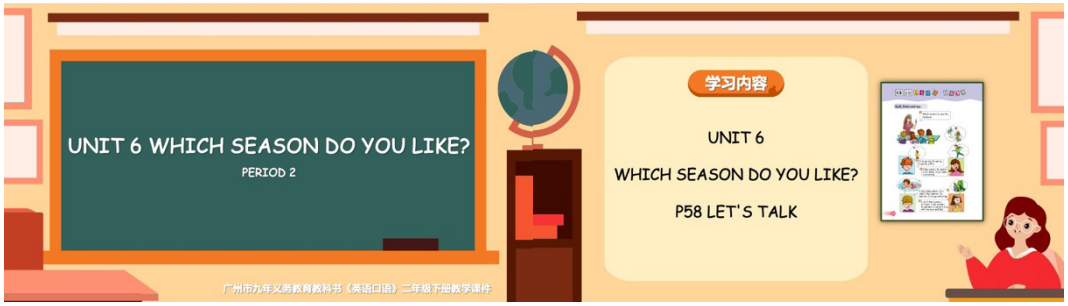
1. 和你的朋友们一起朗读课本 P54-55的内容。

2. 画一幅你最喜爱的季节的图片。





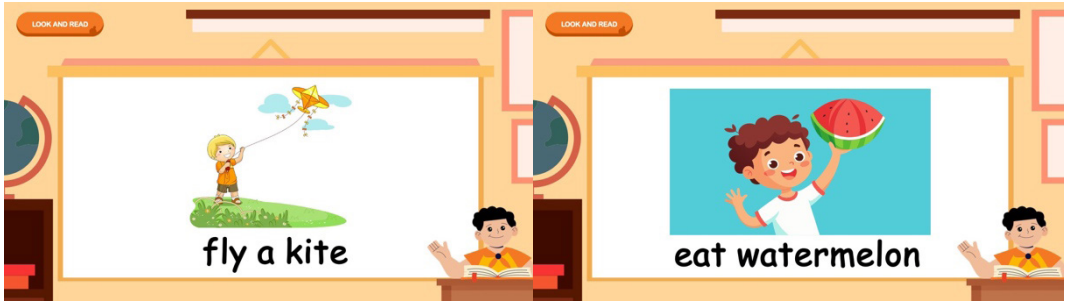
Lesson 2:


UNIT 6 WHICH SEASON DO YOU LIKE?
PERIOD 2
学习内容
UNIT 6
WHICH SEASON DO YOU LIKE?
P58 LET'S TALK


学习目标
1. 知道 x says /x/。
2. 复习认读: spring, summer, autumn, winter。
3. 能听、说、读和理解词组: go hiking, go fishing, go swimming, make a snowman。
4. 能从天气和活动等方面连贯谈论季节。
PHONICS TIME


Vv
van
LET'S LOOK BACK


LOOK AND READ
autumn
winter
summer
winter
summer
spring
autumn
LOOK AND READ
drink coke


LOOK AND READ
fly a kite
LOOK AND READ
eat watermelon


LOOK AND READ
eat ice cream

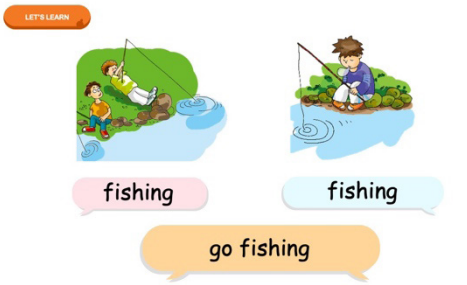

LOOK AND READ
go skating

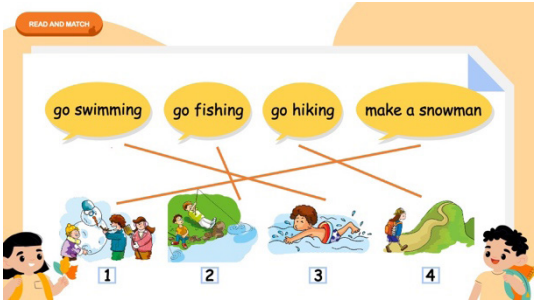

LET'S LEARN


LET'S LEARN
snowman
snowman
make a snowman


LET'S LEARN
swimming
swimming
go swimming


LET'S LEARN
hiking
hiking
go hiking


LET'S LEARN
fishing
fishing
go fishing


READ AND MATCH
go swimming
go fishing
go hiking
make a snowman
1
2
3
4


LOOK AND SAY
REC
Hello. What can you do in different seasons?


LOOK AND SAY
I can make a snowman in winter.


LOOK AND SAY
I can fly a kite in spring.
I can fly a kite in autumn.


LOOK AND SAY
I can go fishing in spring.
I can go fishing in winter.

LOOK AND SAY



I can go hiking in spring.

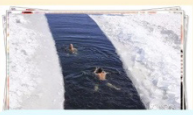


I can go hiking in winter.

LOOK AND SAY



I can go swimming in summer.



I can go swimming in winter.

LOOK AND SAY



I can go skating in winter.



I can go skating in spring.

LOOK AND SAY





I can go skating in summer.

LOOK AND SAY



I can eat ice cream in summer.



I can eat ice cream in winter.

LET'S WATCH

LET'S WATCH



LISTEN AND MATCH

I like spring.
In spring, I can fly a kite.



LISTEN AND MATCH

I like winter. In winter,
I can skate.
I can make a snowman.



LISTEN AND MATCH

I don't like winter.
It's cold. I like summer.
In summer, I can go swimming.



LISTEN AND MATCH

I don't like summer.
It's hot. I like autumn.
In autumn, I can go hiking with my mum and dad.



LET'S READ



Which season do you like, children?

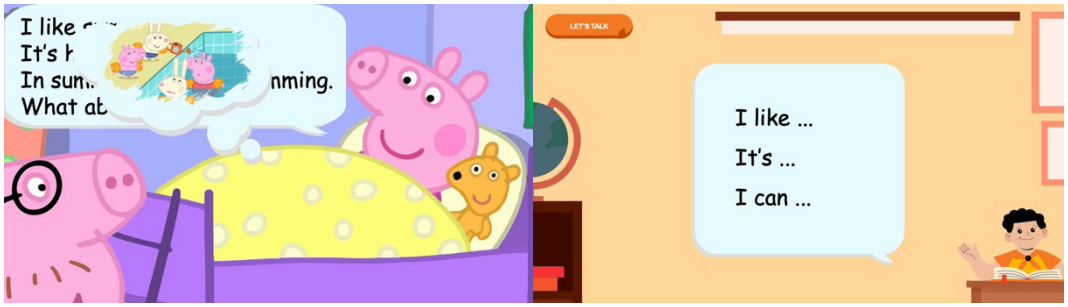

LET'S READ
I like spring.
In spring,
I can fly a kite.
LET'S READ
I like winter.
In winter, I can skate.
I can make a snowman.


LET'S READ
I don't like winter.
It's cold.
I like summer.
In summer,
I can go swimming.
LET'S READ
I don't like summer.
It's hot.
I like autumn.
In autumn,
I can go hiking with
my mum and dad.


READ IN ROLES
Which season do you like, children?
I like spring. In spring, I can fly a kite.
I like winter. In winter, I can skate. I can make a snowman.
READ IN ROLES
I don't like winter. It's cold. I like summer. In summer, I can go swimming.
I don't like summer. It's hot. I like autumn. In autumn, I can go hiking with my mum and dad.


CIRCLE AND READ
圈出make并大声读5次。
make
LET'S READ
make
make make take make take make

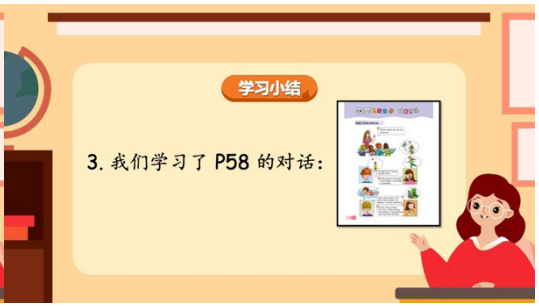

LET'S TRY
LOOK AND READ
Which season do you like?


LET'S TALK
I like ...
It's ...
I can ...

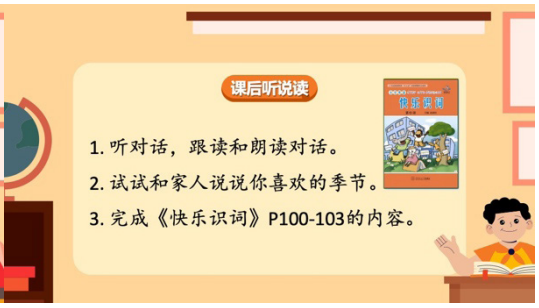

LET'S SUM UP

学习小结
1. 我们知道了 x says /x/。
/x/


学习小结
2. 我们复习了以下的单词：
spring summer autumn winter


学习小结
3. 我们学习了 P58 的对话：


学习目标
4. 我们尝试描述自己喜欢的季节。
I like summer.
It's hot.
In summer, I can go swimming.
What about you?


课后听说读
1. 听对话，跟读和朗读对话。
2. 试试和家人说说你喜欢的季节。
3. 完成《快乐识词》P100-103的内容。

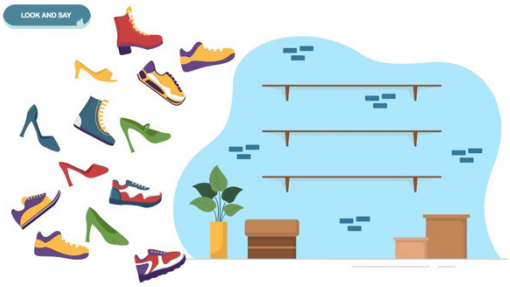

课后听说读
1. 听对话，跟读和朗读对话。
2. 试试和家人说说你喜欢的季节。

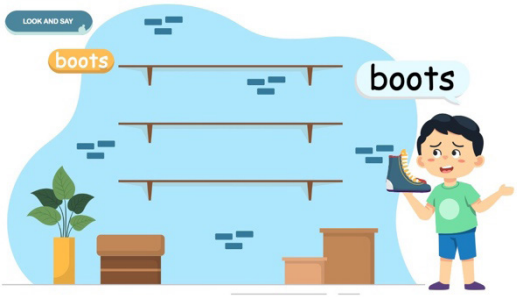
Lesson 3:


UNIT 6 WHICH SEASON DO YOU LIKE?
PERIOD 3
广州市九年义务教育教科书《英语口语》二年级下册教学课件
学习内容
UNIT 6
WHICH SEASON DO YOU LIKE?
P57 LET'S CHANT
学习目标
1. 知道 y says /y/。
2. 能听、说、读单词 coat, sandals, trainers并理解其意义。
3. 能理解和朗读 P57的小诗。
4. 能知道不同季节的天气和衣着。
5. 能认读单词 when, wear。
PHONICS TIME
Vv
van
LET'S LOOK BACK
SIGHT WORDS TIME
LOOK AND SAY
T-shirt
LOOK AND SAY
sweater
LOOK AND SAY
dress


LOOK AND SAY
skirt
LOOK AND SAY
jacket
LOOK AND SAY
jeans
LOOK AND SAY
shirt
LOOK AND SAY
shorts
LOOK AND SAY
What is this?
LET'S LEARN
a coat
LOOK AND CHOOSE
Which one is a coat?
A
B
LOOK AND CHOOSE
Which one is a coat?
A
B
LISTEN AND REPEAT
Skirts for summer.
spring
summer
autumn
winter
LISTEN AND REPEAT
Coats for winter.
spring
summer
autumn
winter


LISTEN AND REPEAT
When it's autumn,
I wear sweaters.
When it's spring,
I wear sweaters, too.
How about sweaters?
spring
summer
autumn
winter


LOOK AND SAY


LOOK AND SAY
boots
boots


LOOK AND SAY
boots
trainers
trainers

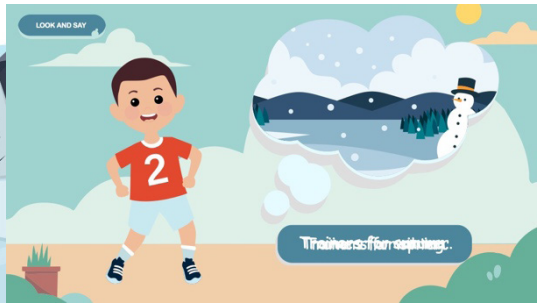

LOOK AND SAY
boots
trainers
sandals
sandals

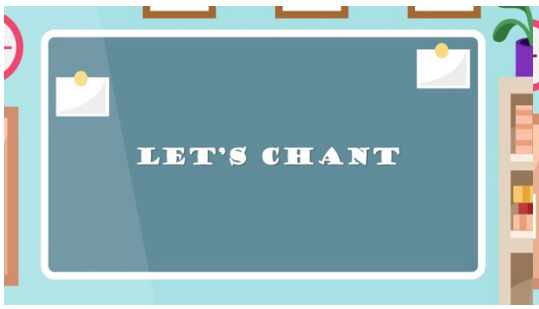

LOOK AND SAY
boots
trainers
sandals
Good Job!

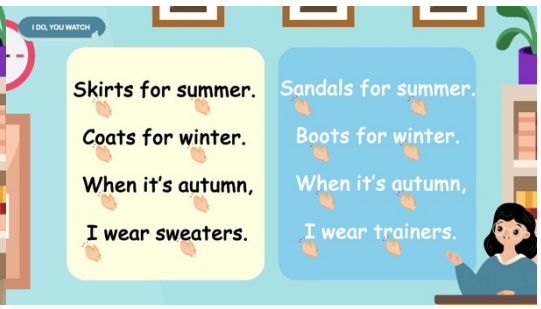

LET'S PLAY
sandals
trainers
boots
START


LOOK AND SAY
Sandals for summer.
sandals


LOOK AND SAY
Boots for winter.
boots


LOOK AND SAY
2


LET'S CHANT


I DO, YOU WATCH
Skirts for summer.
Coats for winter.
When it's autumn,
I wear sweaters.
Sandals for summer.
Boots for winter.
When it's autumn,
I wear trainers.


I DO, YOU CLAP
Skirts for summer.
Coats for winter.
When it's autumn,
I wear sweaters.
Sandals for summer.
Boots for winter.
When it's autumn,
I wear trainers.

I DO, YOU CLAP
Skirts for summer.
Coats for winter.
When it's autumn,
I wear sweaters.
Sandals for summer.
Boots for winter.
When it's autumn,
I wear trainers.


LET'S WATCH

LET'S READ


LET'S TRY
MAKE A NEW CHANT
_____ for summer.
_____ for winter.
When it's autumn,
I wear _____.
T-shirt
dress
shorts
skirt
sandals
coat
sweater
boots
scarf
jacket
jeans
shirt
sweater

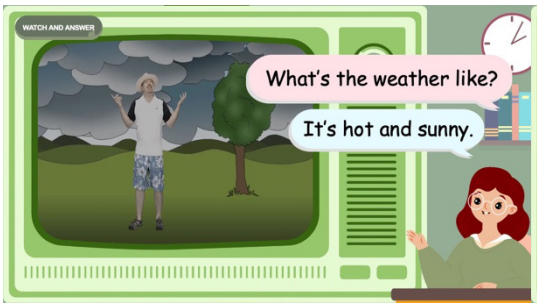

LET'S SUM UP
学习小结
1. 我们知道了 y says /y/。
/y/


学习小结
2. 我们学习了三个单词：
coat
sandals
trainers
学习小结
3. 我们表演了 P57的小诗：
4. 我们知道了不同季节的天气和衣着。


课后听说读
1. 完成《快乐识词》P104 - P107 的内容
2. 听、读、表演 P57的内容。
课后听说读
1. 听、读、表演P57的内容。
2. 帮助妈妈按季节来分类家里的衣服，并尝试用英语来说一说。

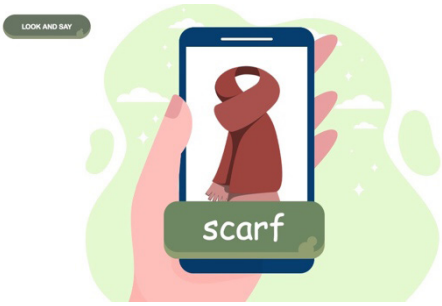
Lesson 4:

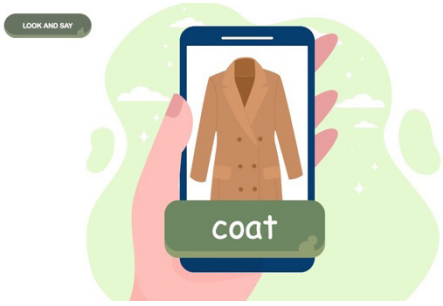

广州市九年义务教育教科书《英语口语》二年级下册教学课件
UNIT 6 WHICH SEASON DO YOU LIKE?
PERIOD 4
学习内容
UNIT 6
WHICH SEASON DO YOU LIKE?
《快乐识词》 P107 & P 112
学习目标
1. 知道 z says /z/。
2. 能熟练听说读已学的衣物类的词汇。
3. 能讲述不同季节的天气、衣着和活动，如 It' s sunny today. I am wearing shorts. I'm riding my bike.
4. 能认读本节课的小语篇。
PHONICS TIME
Vv
van
LET'S LOOK BACK
LOOK AND SAY
winter
spring
autumn
summer
Wow!
Magic Weather Doors
What's the weather like?
It's raining.
What's the weather like?
It's windy.
WATCH AND ANSWER
What's the weather like?
It's cloudy.

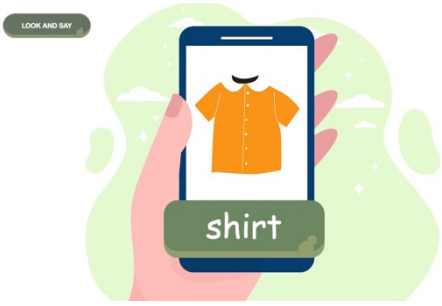

WATCH AND ANSWER
What's the weather like?
It's hot and sunny.

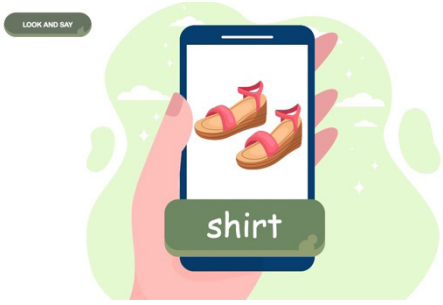

WATCH AND ANSWER
What's the weather like?
It's snowing and cold.


WATCH AND ANSWER

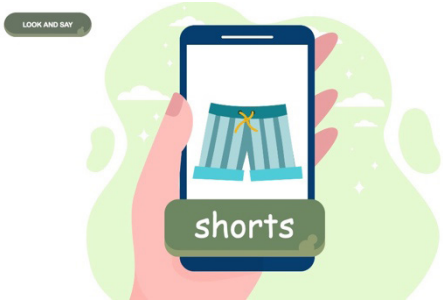

LOOK AND SAY
scarf

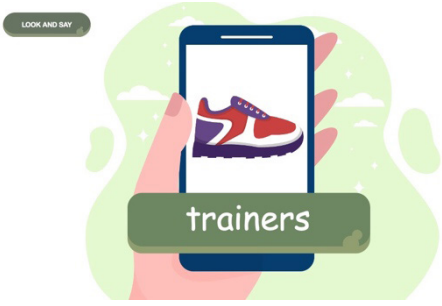

LOOK AND SAY
coat

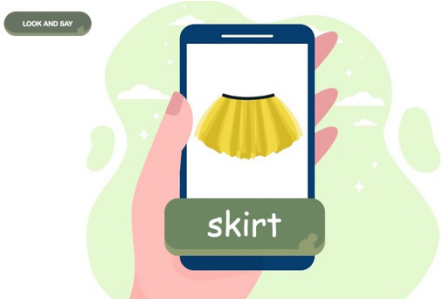

LOOK AND SAY
shirt


LOOK AND SAY
shirt

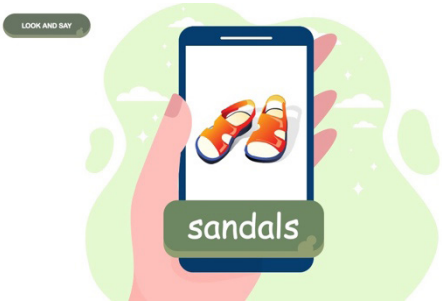

LOOK AND SAY
sunglasses

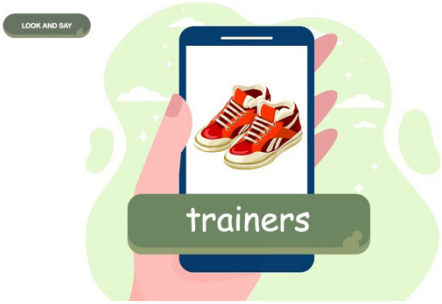

LOOK AND SAY
shorts


LOOK AND SAY
trainers


LOOK AND SAY
skirt


LOOK AND SAY
coat


LOOK AND SAY
sandals

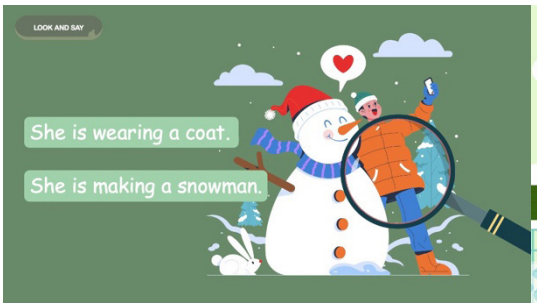

LOOK AND SAY
trainers


LOOK AND SAY
sweater


LOOK AND SAY
jacket


LOOK AND SAY
He is wearing trainers.
He is going hiking.


LOOK AND SAY
He is wearing sandals.
He is going fishing.


LOOK AND SAY
She is wearing a coat.
She is making a snowman.


LOOK AND SAY
He is wearing a T-shirt.
He is going swimming.


LOOK AND SAY
She is wearing a sweater.
She is skating.

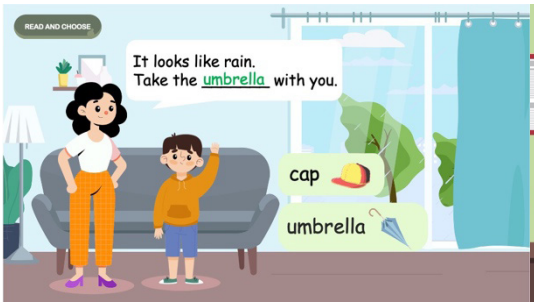

LET'S TRY


READ AND CHOOSE
What a sunny day!
Where are my sunglasses ?
scalf
sunglasses


READ AND CHOOSE
We are going hiking today.
Put on your trainers.
READ AND CHOOSE
Trainers are good for walking.
sandals
trainers

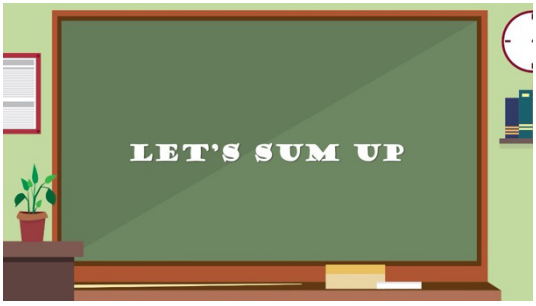

READ AND CHOOSE
It's windy today.
Put on your scarf .
scalf
umbrella

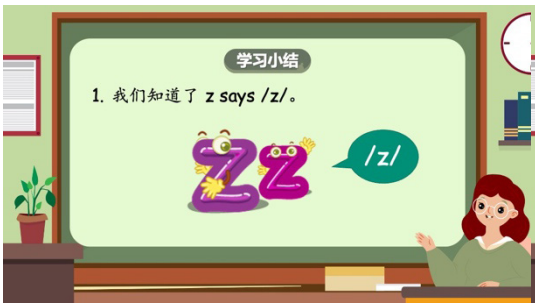

READ AND CHOOSE
Thank you, Mum.
Bye-bye.


READ AND CHOOSE
It looks like rain.
Take the umbrella with you.
cap
umbrella


LET'S TRY


SHOW AND TELL
Hello, I'm Amanda.
Look! It's summer.
It's sunny. I'm
wearing a hat, a
dress and sunglasses.
I'm riding my bike.

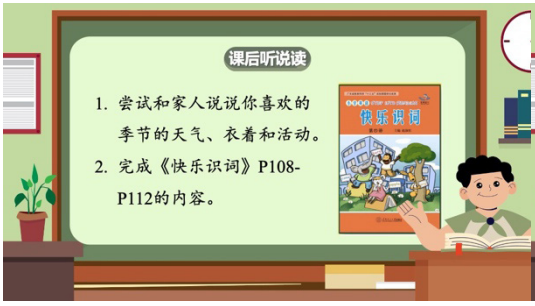

LET'S SUM UP

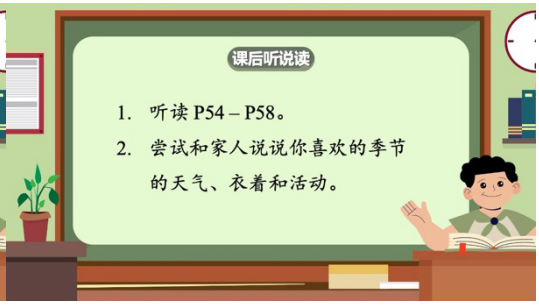

学习小结
1. 我们知道了 z says /z/。
/z/


学习小结
2. 我们复习了衣物类的单词，如：
coat
skirt
sweater
boots
trainers
sandals


学习小结
3. 我们尝试讲述不同季节的天气、衣着和活动。
如：
It' s sunny today.
I am wearing shorts.
I'm riding my bike.


学习小结
4. 我们能认读以下语篇：


课后听说读
1. 尝试和家人说说你喜欢的季节的天气、衣着和活动。
2. 完成《快乐识词》P108-P112的内容。
快乐识词

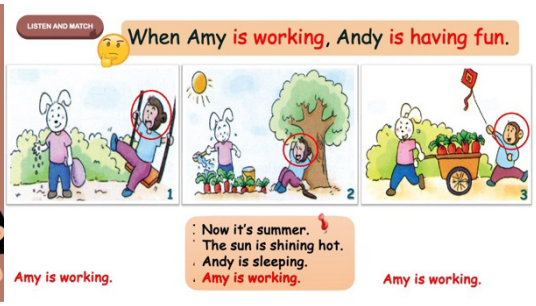

课后听说读
1. 听读 P54 – P58。
2. 尝试和家人说说你喜欢的季节的天气、衣着和活动。

Lesson 5:

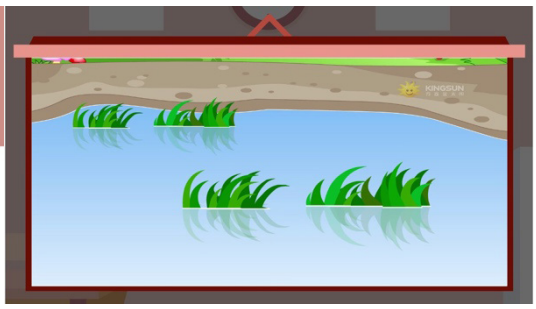

UNIT 6 WHICH SEASON DO YOU LIKE?
PERIOD 5
广州市九年义务教育教科书《英语口语》二年级下册教学课件
学习内容
UNIT 6
WHICH SEASON DO YOU LIKE?
P60-61 STORY TIME
学习目标
1. 能认读单词 work, with 。
2. 能理解 P60-61 Story Time 故事大意。
3. 能有感情地跟读、分角色朗读故事。
4. 能尝试表演故事。
PHONICS TIME
A is for Apple
A.J.Jenkins
LET'S LOOK BACK
SIGHT WORDS TIME
summer
when
warm
spring
autumn
winter
cold
now
hot
LET'S LOOK BACK
(工作)
Don't be lazy.
work hard.
What does the story tell us?
LET'S LEARN
Amy
the Rabbit
Andy
the Monkey


It's winter.
It's cold.
Amy is warm.
She is happy.
She has nice food.
It's winter.
It's cold.
Andy is cold.
He is not happy.
He has no food.

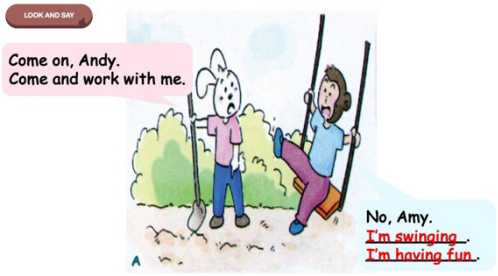

What happened?

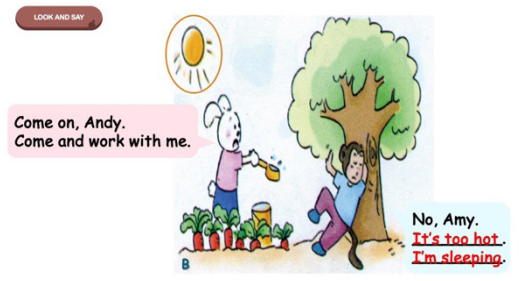

LISTEN AND MATCH
When Amy is working, Andy is having fun.
1
2
3
Now it's summer.
The sun is shining hot.
Andy is sleeping.
Amy is working.
Amy is working.
Amy is working.

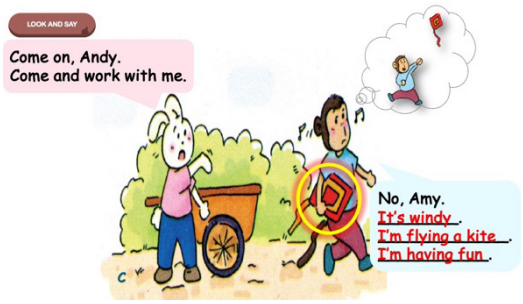

LET'S WATCH



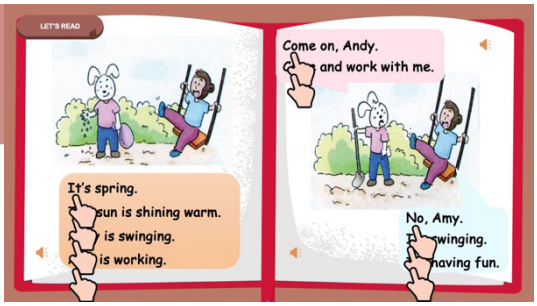

LOOK AND SAY
A
B
C
Come on, Andy.
Come and work with
?


LOOK AND SAY
Come on, Andy.
Come and work with me.
A
No, Amy.
I'm swinging.
I'm having fun.


LOOK AND SAY
Come on, Andy.
Come and work with me.
B
No, Amy.
It's too hot.
I'm sleeping.

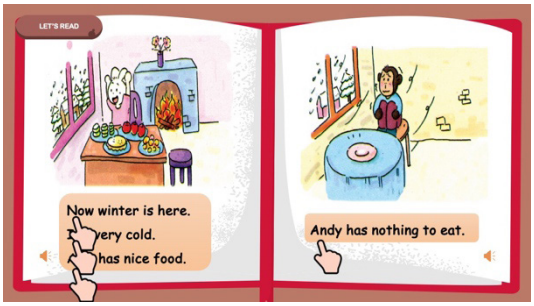

LOOK AND SAY
Come on, Andy.
Come and work with me.
C
No, Amy.
It's windy.
I'm flying a kite.
I'm having fun.


LET'S READ


LET'S READ
Come on, Andy.
and work with me.
It's spring.
sun is shining warm.
is swinging.
is working.
No, Amy.
swinging.
having fun.


LET'S READ
Now it's summer.
sun is shining hot.
is sleeping.
is working.
Come on, Andy.
and work with me.
No, Amy.
too hot.
sleeping.

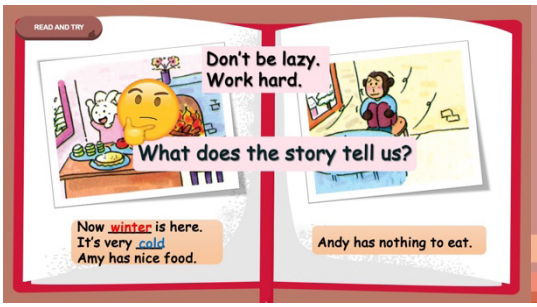
LET'S READ
It's autumn now.
windy.
is flying a kite.
is working.
Come on, Andy.
and work with me.
No, Amy.
windy.
flying a kite.
having fun.


LET'S READ
Now winter is here.
very cold.
has nice food.
Andy has nothing to eat.


READ AND CHOOSE
1
It's spring.
The sun is shining warm.
Andy is swinging.
Amy is working.
spring autumn summer
windy warm hot
sleeping working swinging flying

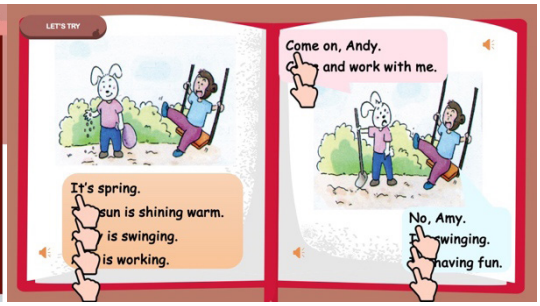

READ AND CHOOSE
2
Now it's summer.
The sun is shining hot.
Andy is sleeping.
Amy is working.
spring autumn summer
windy warm hot
sleeping working swinging flying

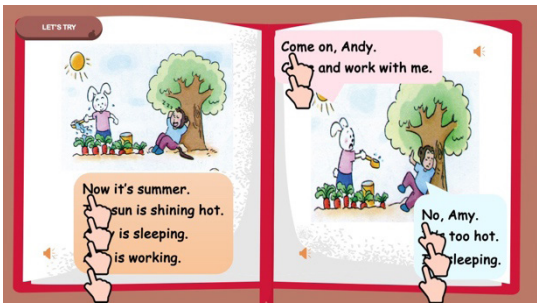

READ AND CHOOSE
3
It's autumn now.
It's windy.
Andy is flying a kite.
Amy is working.
spring autumn summer
windy warm hot
sleeping working swinging flying

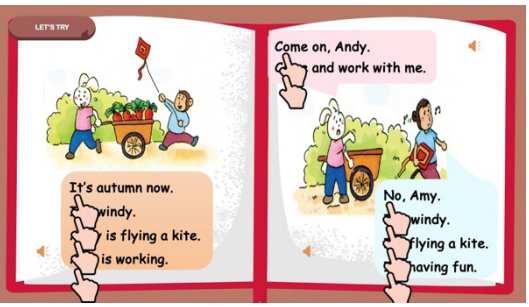

READ AND TRY
Don't be lazy.
Work hard.
What does the story tell us?
Now winter is here.
It's very cold.
Amy has nice food.
Andy has nothing to eat.


LET'S TRY


girl
Amy the Rabbit
boy
Andy the Monkey
narrator（旁白）


LET'S TRY
It's spring.
sun is shining warm.
is swinging.
is working.
Come on, Andy.
and work with me.
No, Amy.
swinging.
having fun.


LET'S TRY
Now it's summer.
sun is shining hot.
is sleeping.
is working.
Come on, Andy.
and work with me.
No, Amy.
too hot.
sleeping.

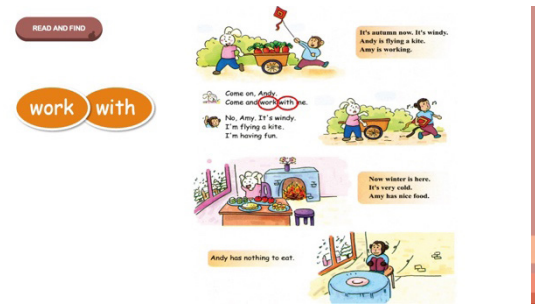

LET'S TRY
It's autumn now.
windy.
is flying a kite.
is working.
Come on, Andy.
and work with me.
No, Amy.
windy.
flying a kite.
having fun.


LET'S TRY
Now winter is here.
ery cold.
has nice food.
Andy has nothing to eat.

ROLE PLAY
girl
Amy the Rabbit
boy
Andy the Monkey
narrator（旁白）


SIGHT WORDS TIME


READ AND FIND
work with
It's spring. The sun is shining warm. Andy is swinging. Amy is working.
Come on, Andy. Come and work with me.
No, Amy. I'm swinging. I'm having fun.
Now it's summer. The sun is shining hot. Andy is sleeping. Amy is working.
Come on, Andy. Come and work with me.
No, Amy. It's too hot. I'm sleeping.

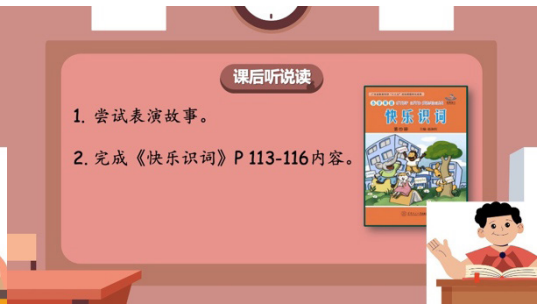

READ AND FIND
work with
It's autumn now. It's windy. Andy is flying a kite. Amy is working.
Come on, Andy. Come and work with me.
No, Amy. It's windy. I'm flying a kite. I'm having fun.
Now winter is here. It's very cold. Amy has nice food.
Andy has nothing to eat.


LET'S SUM UP


我们复习了这些单词：
work with


我们学习了 P60-P61 的故事。


我们尝试了角色扮演。
Amy the Rabbit
Andy the Monkey
narrator（旁白）


课后听说读
1. 尝试表演故事。
2. 完成《快乐识词》P 113-116内容。
快乐识词


课后听说读
1. 听、跟读并朗读故事。
2. 尝试表演故事。

FEEDBACK INTERVIEWS

Question guides

INTERVIEW QUESTION GUIDES

For motion graphics as an educational tool that supports learning English vocabulary by Chinese students

In-depth semi-structured interviews in phase 2 (part 2)

Greeting

Warm up

"How are you doing today?"

1. Introduce myself as the interviewer.

2. Explain to the participant about what we are going to do in this interview:

"This will be an approximately 1-hour interview where you will be invited to share your feedback on the experimental motion graphics teaching materials.

3. Confirm with the participant that they do understand the information sheet and willing to give his/her consent on this interview.

"All the detailed information have been written on the information sheet that I sent you before. Please allow me to emphasize again, the results of this interview will be anonymised, written up and submitted as a part of supporting data in the PhD thesis and may be used in publications. With your consent, the interview will be video-recorded. Once the recording has been transcribed and verified, the video-recording will be destroyed.

4. Answering any questions form the participant.

"Before you sign this consent form, do you have any questions about this interview? If you are understand and agree, could you please sign on the consent form for me, then we can start our interview."

*The above is the general flow of the interview, the details of which will be modified slightly according to the previous steps.

Free expression

This is a free time for thoughts and opinions about how the teacher feels overall after using the new teaching materials. Questions that might be used for guidance:

*"**Can you please share your overall experience of using the new courseware after using it?***

For example, overall, is the new version more helpful to your teaching process than the old one?

Which courseware design would be more in line with your teaching style or pace?

Feel free to share any feelings or thoughts you may have."

Discussion

Show the teacher a particular/series page, review the design changes in the new version with the teacher:

*"**For these changes, you would think:***

Agree/positive:

What happens to make you feel that these design modifications are positive for teaching and learning?

For example,
In terms of teaching, is it an effective aid to your teaching activities?
On the student side, how did the students respond? how are their learning outcomes?

In contrast to the old version, please can you share why you think this has had a positive effect?

Disagree/negative:

What happens to make you think that these design modifications are non-obviously effective/negative for teaching and learning?

For example,
In terms of teaching, do the new changes hinder your teaching activities?
On the student side, how did the students respond? How are their learning outcomes?"

In contrast to the old version, could you please share the reasons why you think it created a negative/non-obvious effect?

*The above is the general flow of the interview, the details of which will be modified slightly according to the previous steps.

When a teacher considers a modification to have a useless or negative impact, the reason for the modification will be explained to the teacher:

"This modification occurs because ..."

A discussion will be launched with the teacher about the reasons for the modifications:

"Do you think it's reasonable for this motivation?

Can you share your opinion based on your real school experience?

Do you have thoughts or needs for further modifications?"

Free expression

This is a time for free expression, where teachers are invited to share their observations of student responses based on their lessons,

"How was the student feedback in the comparison of the use of the old and new versions of the teaching materials?"

which can be discussed in the following contexts:

1 Students' responses to the new version of the teaching materials in lessons.

2 Comparison of students' outcomes after learning from the teaching materials.

*The above is the general flow of the interview, the details of which will be modified slightly according to the previous steps.

Ending

"Thank you very much for participating in this interveiw. The information you have provided has been very helpful.

Are there any questions that I can answer before we end the session?

Thank you again for your help. I really appreciate your time and your knowledge."

*The above is the general flow of the interview, the details of which will be modified slightly according to the previous steps.

Final themes, subthemes and codes (FEEDBACK INTERVIEWS 1)

Theme 1: The Impact of Courseware Visual and Color Design on Learning Experience

Category A: Use of Color and Visual Perception
Focuses on how color selection, combination, intensity, and brightness affect students' visual and psychological experiences.*
1. Color brightness affects students' sensory experience.
2. Overly dark background colors negatively affect visual experience.
3. Imbalanced color tones interfere with visual perception.
4. Color intensity influences visual comfort.
5. Color design affects student interest.
6. Color and context trigger intuitive responses.
7. Students dislike the use of green.
8. Visual preference for cool color tones.
9. Suggestions regarding the use of green.
10. Preferences toward color usage.
11. Overly complex color schemes make comprehension difficult.
12. Color contrast affects students' recognizability.
13. Color tone influences classroom atmosphere, though teachers' personal perception is relatively weak.
14. Rich combinations of color and motion are attractive to students.
15. Color blending should be moderate to avoid visual clutter.
16. The impact of color on student learning is difficult to determine.

Category B: Typography, Layout, and Page Clarity
Concerns how text design, font size, and layout affect information recognition and classroom focus.*
17. Inconsistent font sizes negatively affect reading experience.
18. Font modifications are more standardized, but teachers mainly require clarity of expression.
19. Preference for layouts that are visually clear and clearly segmented.
20. Layout affects reading order and comprehension sequence.
21. Teachers emphasize the importance of classroom engagement (related to content clarity).
22. A unified framework design offers advantages in recognizability.
23. Preferred courseware visual design: simple, clear, sentence-centered.
24. Visual cues support classroom interaction.
25. Visual cues guide classroom interaction.
26. Visual focus influences cognitive understanding.

Category C: Use of Patterns and Decorative Elements
Focuses on the functionality and acceptance of patterns (non-image elements) used as decoration or instructional cues.*
27. Pattern usage needs to be explicit; otherwise, it may cause controversy.
28. Patterns are easier to understand than text.
29. Patterns and images should be used selectively depending on context.

Category D: Visual Attractiveness and Emotional Response
Describes students' and teachers' perceptions of aesthetics, attractiveness, and visual comfort.*
30. Preference for visual styles that are aesthetically pleasing and color-attractive.
31. Improved image quality generates positive impressions.
32. New visual designs enhance students' positive feelings.
33. Aesthetic appeal also improves teachers' user experience.
34. Visual attractiveness enhances classroom concentration.
35. Screen/image size is critical to students' visual experience.
36. Visual representation affects students' understanding and the time required for comprehension.

Category E: Emphasis Strategies and Use of Contrast
Focuses on how color and composition help highlight learning priorities.*
37. Image color and composition influence understanding.
38. Compared with the old design, teachers need to spend more time explaining it.
39. Key content can be emphasized using a white background for contrast.
40. Design variations serve as visual focal points but require balance.

Category F: Visual Impact Related to Teacher Feedback and Lesson Plan Integration
Teacher-centered evaluations focusing on system-level usability.*
41. Challenges in integrating lesson plans and courseware affect usage frequency.
42. Integrating lesson plan information into PPT helps avoid repetition.
43. Teachers' preferences may not align with student acceptance.
44. Lesson plan content is complex and overly theoretical.
45. Frequent teacher operation affects teaching rhythm.
46. Teachers emphasize the importance of classroom engagement (also categorized under B).

Category G: Textbook Images, Materials Matching, and Detail Issues
Concerns mismatches between image content and instructional meaning.*
47. Image style influences cognition.
48. Students' interest is usually focused on content rather than color.
49. The new version of courseware lacks scene continuity.
50. Image arrangement affects understanding and aesthetic appeal.

Category H: Miscellaneous / Integrative Observations
51. Teachers are more concerned with clarity of image structure.
52. Overall regulation of visual experience through color requires systematic consideration.

Theme 2: The Role of Image and Animation Presentation in Student Understanding and Classroom Engagement

Category A: Image Size, Composition, and Information Transmission
1. Image size affects information extraction.
2. Image size influences observation and cognition.
3. Enlarging images enhances information transmission.
4. Improved image quality generates positive impressions.
5. Blurry images cause comprehension difficulties.
6. Overly complex composition distracts students' visual focus.
7. Images that are too small hinder emphasis of key points.
8. Multiple images presented simultaneously cause cognitive interference.
9. Image composition influences visual attention.

Category B: Animation Pace, Quantity, and Cognitive Load
10. Animation pacing varies among individuals; animations can feel prolonged.
11. Excessive animation disrupts teaching rhythm.
12. Special effects and playback pace should align with instructional focus.
13. Sound effects enhance instructional emphasis but require volume control.
14. Revised courseware increases animation intensity.
15. Animation speed affects teachers' explanatory pacing.
16. Animation creates visual burden.
17. Animation attracts attention but does not guarantee effectiveness.
18. Rapid visual changes disrupt teaching flow.
19. Animation pacing varies across individuals (repeated).

Category C: Image–Text Integration and Language Input Support
20. Images combined with text support students' expressive output.
21. Image selection should more precisely match the teaching context.
22. Image–content alignment needs higher precision.
23. Imbalance between text and images.

24. Image–text presentation should follow a rhythmic sequence.
25. Semantic image matching enhances cognition.
26. Images with narrative quality promote associative thinking.
27. Pairing images with words is the most common and intuitive vocabulary teaching method.

Category D: Image/Animation Attractiveness and Student Response
28. Image attractiveness enhances student attention.
29. Students like animations, but teachers report poor usability experience.
30. New patterns are more attractive to students.
31. New courseware is more vivid and includes more activities.
32. Interesting content attracts attention.
33. New designs make students more engaged.
34. Images fail to convey instructional intent clearly (counterexample).
35. Students show immediate reactions to visual content.

Category E: Presentation Order and Rhythm Control
36. Image presentation sequence is clear.
37. Animation effects enhance contextual atmosphere.
38. Images are used to establish learning contexts.
39. Simultaneous appearance of multiple images disrupts focus.
40. Progressive image presentation enhances learning experience.
41. Shortening courseware content and merging class sessions.
42. Image style influences cognition.
43. The order of animations and images affects information processing.

Category F: Visual Style and Courseware Design Preferences
44. The importance of images varies across instructional stages.
45. Preferred courseware visual design: simple, clear, sentence-centered.
46. Image composition influences visual attention (repeated; also in A).

Theme 3: Alignment Between Contextual Design and Students' Life Experience

Category 1: Context–Life Experience Alignment
1. Complete, life-related scenes are easier to understand.
2. Scene establishment facilitates understanding and is more recognized by teachers.
3. Scenes support comprehension.
4. Scene settings should align with students' life experiences.
5. Scene design should be close to students' experiences.
6. Local cultural background should be reflected in courseware.
7. Regional climate affects image interpretation.
8. Teaching content should connect with real-life scenarios.
9. Everyday language combined with images aids understanding.
10. Familiar environmental elements help students identify new vocabulary.
11. Home-related images should align with children's cognitive norms.

Category 2: Impact of Images and Characters on Student Response
12. Students respond intuitively to character representation.
13. Familiar cartoon characters may cause students to ignore learning content.
14. Contextual images stimulate student interest.
15. Family-context elements influence immersion.

Category 3: Teachers' Intentional Contextual Design and Preferences

16. Teachers emphasize scene establishment.
17. Lesson plan design aims to extend textbook content.
18. Curiosity drives courseware scene design.
19. Teachers intentionally introduce competitive mechanisms.
20. Some teachers prefer spinning-wheel games.

21. Game design should guide students to speak more.

Theme 4: Attention Management and Multisensory Teaching Strategies

Category 1: Cognitive Load and Information Processing
1. Presenting information all at once causes cognitive load.
2. Excessive information density leads to confusion.
3. Conflicts between text and images affect learning focus.
4. Progressive presentation enhances concentration.
5. Managing information load across age differences.
6. Sensory-dominant information processing.
7. Cognitive theory is referenced to explain visual guidance.

Category 2: Role of Audio and Sound Effects in Attention Regulation
8. Automated audio enhances immersive learning experiences.
9. Automated audio affects teachers' teaching rhythm.
10. Sound effects assist student understanding.
11. Sound effects can be used to manage attention.
12. Sound effects enhance attention.
13. Sound effects should support teaching rather than distract.
14. Audio increases attention and learning engagement.
15. Audio design should complement teacher operation, supporting pronunciation and listening.
16. Key content can be reinforced through delayed presentation and sound effects.
17. Sound effects should be controllable.
18. Students generally like sound effects and respond positively.

Category 3: Age, Language Background, and Attention Differences
19. Young age and English as a second language weaken attention.
20. Information load management across age differences (repeated).
21. Teachers monitor students' attention span.
22. Students are sensitive to sensory stimulation.
23. Younger students are difficult to test; observation is primary.

Category 4: Teacher-Regulated Attention Strategies (Non-verbal)
24. Teachers use non-verbal strategies to direct attention.
25. Clapping or group activities help refocus attention.
26. Calling names and eye contact refocus attention.
27. Teachers use body language to highlight key content.

Category 5: Multisensory and Visual Design
28. Multimedia elements assist attention.
29. Students notice changes in courseware details.
30. Color, imagery, and pacing jointly affect attention.
31. Scene switching and visual transitions serve as attention-shifting tools.
32. "Enlarge-and-brighten" animations reinforce memory focus.

Category 6: Interaction and Game-Based Attention Strategies
33. Fast-paced games increase student participation.
34. Game frequency should be controlled to avoid aesthetic fatigue.
35. Courseware lacks sufficient interactivity and needs improvement.

Theme 5: Sensory- and Intuition-Driven Learning Approaches of Students

Category 1: Intuition- and Sensory-Based Judgement
1. Students rely on feelings as the basis for judgment.
2. Students rely on intuitive judgment.
3. Students prefer intuitive content.
4. Students show immediate reactions to visual content.

5. Students are sensitive to sensory stimulation.
6. Students' cognitive processing is intuitive.
7. Sensory-dominant information processing.

Category 2: Interest- and Fun-Driven Engagement
8. Students are more engaged in fun content.
9. Students generally like sound effects and respond positively.
10. Students respond positively.
11. Competitive interaction strongly attracts students.
12. High entertainment value may weaken contextual immersion.

Category 3: Detail Sensitivity and Visual Reaction
13. Students notice changes in courseware details.
14. Students react differently to new and old designs.
15. Students respond intuitively to character representation.
16. Students easily notice details.
17. Images attract more student attention.
18. Use of small finger icons attracts students.

Category 4: Color Preference and Perception
19. Students' interest is mainly in content rather than color.
20. Students' color preferences vary.
21. Students are more interested in content interaction than color.
22. Students prefer cool color tones.

Category 5: Content Understanding and Interface Complexity
23. Students have weak memory performance.
24. Students judge content appropriateness based on images.
25. Some students become absorbed in characters and ignore learning.
26. Students feel confused by structurally complex pages.

Category 6: Habit and Familiarity
27. Younger students are difficult to test; observation is primary.
28. Students like animations, but teachers report poor usability experience.
29. Students feel the new version provides a better experience.
30. Students tend to prefer familiarity and habitual use.

Theme 6: Teacher Feedback and Challenges in Teaching System Integration

Category 1: Lesson Plan–Courseware Integration Dilemmas
1. Integrating lesson plan information into PPT avoids repetition.
2. Lesson plan content is complex and theoretical.
3. Lesson plans are formalized and used only in specific situations.
4. Lesson plans lack practical value.
5. Teachers rarely consult lesson plans during actual teaching.
6. Lesson plan design aims to extend textbook content.
7. Integration challenges affect usage frequency.
8. Repetitive feedback occurs during integration processes.

Category 2: Teacher Modification and Teaching Style Adaptation
9. Teachers usually modify courseware according to their own situations.
10. Teachers prefer manual control of courseware pacing.
11. Frequent teacher operation disrupts teaching rhythm.
12. Teacher-controlled pacing reduces distraction risk.
13. Difficulty of modification affects teachers' willingness to revise.
14. Courseware suitability to teaching methods is important.
15. Teachers adjust flexibly according to student ability.
16. Teachers prioritize pacing and interaction over theory.

17. Significant differences exist in teachers' depth of modification.
18. Teaching preferences affect courseware usage frequency.
19. Teachers emphasize operational efficiency.
20. Modified versions align better with teachers' pacing.
21. Teachers request simplified courseware for daily use.
22. Teachers suggest producing multiple versions for flexibility.

Category 3: Feedback on Visual and Audio Details
23. Teachers rarely modify courseware colors.
24. Audio settings depend on individual teacher choice.
25. Color replacement often reflects teachers' personal interest.
26. Teachers question the appropriateness of certain images.
27. Teachers suggest merging animation steps.
28. Teachers describe courseware as "too busy" or "too noisy."
29. Teachers propose detailed improvements (color/position).
30. Teachers suggest retaining some legacy materials.
31. Teachers do not favor overly complex interaction formats.

Category 4: Gap Between Teacher Perception and Student Response
32. A gap exists between teacher perception and student feedback.
33. Teachers' preferences may not align with student acceptance.
34. Aging courseware and textbooks create pressure for updates.
35. New courseware is more vivid and includes more activities.
36. New patterns attract students more.
37. New visual designs enhance student impressions.
38. Students respond differently to new and old designs.
39. Teachers worry students may not adapt to new versions.
40. Teachers believe modifications do not affect learning outcomes.

Category 5: Teacher Experience-Based Judgement
41. Teachers' detailed understanding of students.
42. Teachers usually modify courseware according to personal situations (repeated).
43. Teacher feedback is mainly derived from classroom response.
44. Teachers rely more on experiential judgement.
45. Teachers prioritize clarity of courseware structure.
46. Teacher feedback is the primary source for optimization.
47. Teacher feedback influences debugging and version selection.

Category 6: Teaching Content and Classroom Mechanisms
48. Teachers intentionally introduce competition mechanisms.
49. Teachers emphasize scene establishment.
50. Teaching content design elements.
51. Repetitive teaching increases student participation.
52. Teachers emphasize scene establishment (repeated).

Category 7: Expectations for Technical and Team Support
53. Teachers expect technical teams to better understand instructional needs.

Interview transcript (FEEDBACK INTERVIEWS 1)

Interview Transcript Teacher A

Interviewer: Researcher
Interviewee: Teacher A

Researcher: Hello, did you use all of the new courseware, or did you use it selectively?

Teacher A: I used all of the new courseware you designed.

Researcher: And this was your first time using this new courseware, correct? One class used the old version, and one class used the new one?

Teacher A: Yes, that's right. One of my classes used the old version, and the other class used your new courseware exclusively.

Researcher: So, what was your overall feeling after using it?

Teacher A: Overall, I feel that the two versions of the courseware are not that different in terms of the teaching flow. However, I spoke with the students in the class that used the new courseware, and their feedback was that they prefer your new design. There are two main reasons: first, they think the new courseware is better-looking and more eye-catching; second, they like the new colour schemes and graphics, finding them much more beautiful than the old version.

From the students' reactions, the class using the new courseware was indeed slightly more responsive in class. This is because, in your new courseware, some of the scenes are constructed more completely, allowing students to understand and react more quickly.

However, the new courseware does have a small shortcoming, which is that it doesn't provide enough language support for the students. Although the graphics are rich, there is less corresponding language support, so the students' language output was just average. But even so, the output from the class using the new courseware was still better than that of the class using the old one.

Researcher: So, you feel that the new courseware was more effective for student learning?

Teacher A: Yes. Because the students themselves said they liked it and that it was "comfortable to look at," they found it easier to understand. In contrast, students in the other class would sometimes see a scene in the old courseware and not quite understand what was happening, requiring me to explain further. I primarily judge learning effectiveness by observing their immediate reactions and interactions in class. For first and second graders, using tests to measure effectiveness is affected by many other factors, so in-class feedback is a more important indicator.

Researcher: From your perspective as a teacher, what was the user experience like?

Teacher A: Because the teaching flow of the two versions isn't very different, I found both relatively easy to use, and I needed to adapt based on student reactions. However, I personally also prefer your new version because it's more aesthetically pleasing and operates more smoothly.

Researcher: Did you make any modifications to the new courseware while using it?

Teacher A: I made some minor adjustments, mainly to the animations. For example, some animations play automatically and continuously, so I changed them to a step-by-step, click-to-play format. This is because sometimes students are not yet proficient with new words, and I need them to follow my reading first. I would confirm their pronunciation was correct before moving on to the next step. I mainly modified the animations; the illustrations were left almost untouched.

Researcher: How did you ask the students for their opinions on the courseware?

Teacher A: I asked them after class. I would ask, "The courseware we've been using recently is different from the old one. Which one do you like more? Why?" They would mention the colours. For instance, the new courseware has several different colour schemes, so I would ask them which colour they liked and why they liked or disliked it. They were able to express their feelings, such as finding a particular colour combination "very comfortable to look at."

Researcher: From a teaching perspective, were there any specific differences in how the students in the two classes learned?

Teacher A: The students themselves are different; one class is generally more active. But even so, in the class using the new courseware, students rarely "zoned out"—that is, knowing what they want to answer but not knowing how to say it in English. This situation occurred more frequently in the class using the old courseware. Overall, the classroom flow was smooth for both, and the difference in in-class performance wasn't huge. The real difference is in how much they remember after class.

Researcher: Let's look at a few specific examples. For instance, this slide comparing the "fan" and the feeling of "cool."

Teacher A: The feeling students get from these two images is very different. In the new image on the left,

the visual focus is very concentrated. Students can immediately see the little person and his hair being blown up, so they can quickly figure out that this means “cool.” But in the old image on the right, the visual elements are very scattered—there’s a sun, a person, a watermelon. The students’ attention is divided, and they need a moment to process the meaning.

This actually relates to what’s mentioned in educational psychology: young students will first notice the most prominent point in an image. Therefore, the design on the left has a clear focus, and students can grasp the information quickly.

Researcher: Is it a similar principle for the slide about the air conditioner?

Teacher A: Yes, very much so. The class using the new courseware saw the image on the left and immediately said, “It’s so cool!” This is because the air conditioner is in the centre of the image and very prominent. Moreover, the entire image uses a blue colour scheme, which gives them a cool feeling. In contrast, the class with the old image on the right looked at it for a while before realizing the air conditioner was on. This is because the air conditioner, sofa, window, and other elements in the image are all roughly the same size, with no focal point, so students didn’t know where to look.

Therefore, when the teaching topic involves seasons and weather, coordinating the colour scheme with the theme is very important. Colour itself can give students a very direct feeling.

Researcher: What about this slide for “autumn”?

Teacher A: This slide was less effective. Because we are in Guangzhou, students’ daily lives don’t include an autumn with orange and red maple leaves. When they saw this image, they couldn’t connect it with “cool.” Some students even saw the colour red and asked if it meant “hot.”

For situations like this, if you want students to understand, you need to use other elements. For example, if the falling leaves were an animation, students could grasp the element of “wind” and thus understand “cool” and “autumn.” So, courseware design must take students’ real-life experiences into account.

Researcher: How did you find the revised version of this practice activity?

Teacher A: The new version of this exercise on the left worked very smoothly for the students. Its logic flows from left to right—first look at the picture, then read the sentence—which aligns well with their reading habits. The old version on the right, however, had crowded information and smaller pictures, which students found visually confusing and required more time to process.

Researcher: And this slide for the “spring” scene?

Teacher A: With the new image on the left, students actually had trouble identifying it as “warm.” In their minds, such a big sun should mean “hot.” However, the students with the old image on the right were able to identify it. This is because the tree in that image had appeared repeatedly in previous courseware, so the students had already formed an association that “this tree represents spring.” So, when some concepts are not easy to present visually, “repetition” is an effective method to help students build connections.

Overall, children at this age think very intuitively; they rely on sight and feeling to understand things.

Researcher: For a follow-along reading activity like this, with animations and pictures, does it distract them?

Teacher A: No. Because in this type of activity, the teacher controls the pace. The students need to follow the teacher or the recording, so their attention is managed and it doesn’t have much of an impact.

Researcher: You mentioned the issue of information load, and the comparison on this slide is quite clear.

Teacher A: Yes, the step-by-step presentation in the new courseware on the left is very effective. Students can focus on the item that is currently displayed, so the activity runs smoothly. The old courseware on the right, however, presents all the information at once. The information load is too great, and students easily get confused and lose track of where they are.

For younger students, especially when the task is relatively complex (e.g., they have to read, listen, and do an action), you absolutely cannot present too much information at once. It has to be step-by-step, or they can’t keep up.

Researcher: Were there any interesting phenomena during the role-playing reading activity on this slide?

Teacher A: There was a very interesting phenomenon. With the new courseware on the left, because of the pink and blue labels, the students spontaneously divided themselves: girls read the pink part, boys read the blue part, and the combined part was read by the whole class. This might be because they’ve had

similar role-playing training before, so when they saw such clear visual cues, they organized themselves. With the old courseware, the visual cues were not as obvious, so the whole class just read together.

Researcher: What are your thoughts on the audio in the courseware? Do you use it? Do you prefer auto-play or click-to-play?

Teacher A: I generally use it. If it's always just me talking, students will get bored. Hearing a different voice from an audio clip is a nice change of pace for them. For follow-along reading, I prefer to let students listen to the audio first and try to repeat, and then I correct them if they're wrong. For story-based content, I personally prefer auto-play because it feels more immersive, like the characters in the story are telling them the story, not the teacher.

Researcher: For this exercise question, which layout do you think is better?

Teacher A: The layout of the old version is better. Although the total amount of information is the same, it helps you categorize it, with one type on one side. Students can consciously make comparisons between the separate groups, making it less confusing. The new version's layout, while neat, appears to the students as if all the pictures are mixed together, and they still have to spend time sorting through them.

Researcher: On this slide, the colour blocks in the new and old courseware are very different.

Teacher A: Yes, the colour blocks in the new courseware on the left are very large and clear. So, the students knew exactly which part was for the teacher, which was for the girls, and which was for the boys, and they coordinated very well. In the old courseware on the right, the prompt box was not obvious, and as they were reading, students would get confused about whose turn it was.

Researcher: On this story page, did the Peppa Pig element have any impact?

Teacher A: The image of Peppa Pig was too large, so the students' focus immediately shifted to Peppa Pig, and they didn't pay attention to the text next to it or the smaller, more relevant picture. So, on this page, the students actually needed to think for a moment to figure out what the focus was. In contrast, while the picture in the old courseware wasn't as nice, the focal point (the activity picture) was prominent, and students reacted faster.

Researcher: How did you find the difficulty of this language output activity?

Teacher A: This page was extremely difficult for the students. It only provided three sentence patterns with no picture prompts and expected them to produce language. This is essentially asking second graders to perform at a third or fourth-grade level. They don't have that kind of logical thinking to come up with things to say just from seeing three sentences. They absolutely need pictures as support—for example, pictures of different seasons or different activities—so they can look at the picture and speak. In this activity, only the top students in the class could say a few sentences.

Researcher: In this lesson, how do you view the design of the scenes about organizing clothes and shoes in the new versus old versions?

Teacher A: The design of the new version (like the enlarged clothes and shoes) makes the knowledge points more prominent. Students react faster and immediately understand which piece of clothing or shoe we are talking about. With the old version, because everything is placed together and is smaller, students sometimes have trouble keeping up.

However, the design of the old version has a significant advantage: it creates a **coherent scene**. It first shows clothes being organized and put into a clean closet, then moves on to organizing shoes and putting them on a clean shoe rack. The entire process forms a complete storyline of "tidying my room." During this process, we can naturally integrate moral education, teaching them to learn to tidy their own rooms.

The new version, while highlighting the knowledge points, presents the scenes in a disconnected way, lacking this continuity. The point students get is "I need to sort clothes" and "I need to sort shoes," but they miss the overall context of "I am tidying my room." Therefore, using pictures to create a coherent, life-related scene is very useful for teaching.

Researcher: And what about the extension content related to geography? Were the students able to absorb it?

Teacher A: They actually don't remember the place names they learned before, so teaching these two lessons was quite challenging. However, because the exercise was in a multiple-choice format, they were able to complete the task smoothly. This kind of design is mainly to give them a sense that "knowledge can be integrated" and to cultivate an awareness of comprehensive application.

Researcher: Okay, thank you so much for your incredibly detailed feedback.

Interview Transcript Teacher E

Interviewer: Researcher
Interviewee: Teacher E

Researcher:
Based on your impression from using this new courseware in class, what differences do you think there would be compared to the old version?

Teacher E:
After the revisions, the sense of animation in some of the courseware is stronger. However, the colours in some parts might not be ideal. For young children, they might not like the colours on certain pages, and it might not capture their attention. On the other hand, some of the new images and the areas you modified would definitely make them very curious.

Researcher:
Let's look at it more specifically. For example, the first math lesson, what do you think of the changes? The main adjustments were to the images, animations, and the timing of pop-ups. If you imagine using it in class, what kind of reaction might the students have compared to the old version? Which version do you think would be easier for you to use?

Teacher E:
The core teaching content of the courseware hasn't changed, only the images and animations were modified. For example, in the first lesson, the design that uses four trees to represent the four seasons—I think students would like the revised version more. The visuals are richer. For lower-grade students, as long as you can capture their attention, they will listen more seriously and stay focused.

Researcher:
Would there be instances where, because the visuals are richer, the instructions become less clear? For example, around page 25, there's a design that uses a single image to represent "spring." A teacher previously mentioned that students questioned it, saying, "Why does this picture have to be spring? It could also be summer." Does the new version have similar issues with ambiguous instructions?

Teacher E:
To be honest, I don't think the original version's use of a single tree in full bloom was a very clear representation of spring either. Looking only at the single image you revised, it could indeed lead to the situation other teachers mentioned. However, if you combine it with the image on the following page, the context feels different. There's another issue: it doesn't snow in Guangzhou in the winter. If we use a snow scene to represent winter, the local children might not understand. Perhaps it would be better to use flowers they are familiar with that only bloom in spring, like the kapok flower, to represent the seasons.

Researcher:
Overall, between the old and new versions of the courseware, which one do you think is better?

Teacher E:
I think they both have their pros and cons. Some parts might be better in the old version, while others are better after your revisions. But as I mentioned last time, some of the image choices in the new version are not quite appropriate. For instance, some of the character illustrations look a bit strange.

Researcher:
Which character are you referring to?

Teacher E:
In the fourth lesson, there's a boy with a backpack, with the Canton Tower and autumn trees in the background. That illustration looks a bit odd. However, we later realized this strange illustration was already in the original courseware. We had discussed before that the characters in the practice section of that lesson all looked very strange, including the mother and son in a previous scene.

Researcher:
Do students notice these strange illustrations during class?

Teacher E:

Yes, they do. Sometimes they'll just say it out loud: "Wow, that person looks so weird!"

Researcher:
How do you usually respond as a teacher?

Teacher E:
I usually choose to ignore it. If I respond, the whole class might start discussing it, which would disrupt the flow of the lesson.

Researcher:
You mentioned issues with colour earlier. Could you elaborate on that?

Teacher E:
I feel that one of the greens used in the courseware is a bit too dark and dull. A teacher once mentioned that the classroom blackboard is already dark green, so if the PowerPoint has the same colour tone, the entire front of the room feels green, which isn't visually appealing. The colours could be a bit brighter or lighter.

Researcher:
So students generally prefer brighter colours. Have you ever encountered situations where the courseware colours were too bright or clashing, which in turn distracted them?

Teacher E:
The colours shouldn't be *too* bright either. For example, you can use fluorescent green or yellow for highlighting or marking specific areas. But if the entire page uses such colours extensively, it will cause visual fatigue after a while.

Researcher:
Regarding animations, do you feel any parts move too fast, are illogical, or are inconvenient to operate? For instance, some teachers have mentioned that setting some animations to auto-play would be smoother than requiring a click. What are your thoughts?

Teacher E:
I personally prefer to control the playback pace of animations myself, rather than having them pop up automatically. Even for very minor animations, I'd rather click through them myself. This is very convenient at our school because we use touchscreen all-in-one displays. I can either tap the screen directly or use a presentation remote.

Researcher:
Regarding the images in the courseware, do you think it's better to use the original images from the textbook or to find new ones?

Teacher E:
Actually, the official courseware that came with our original textbook didn't frequently use the original images from the book either.

Researcher:
Besides colour, do you have any preference for the overall colour scheme of different lessons (e.g., cool tones vs. warm tones)?

Teacher E:
(After reviewing different lessons) I personally like the colours of the third lesson the most (the blue-toned one). I don't really like the colours of the fourth lesson. The pink theme of the fifth lesson also feels a bit too dark; it would be better if it were brighter.

Researcher:
What about the layout? For example, the placement of images and sentences—do you find any arrangements to be illogical?

Teacher E:
The layout is quite similar to the original version you sent. I've mentioned before that in the second lesson, a matching exercise was changed to a circling activity, but having five pictures clustered together made the screen look cluttered, and students might find it difficult to understand the connection between the pictures and sentences.

Researcher:

Do you think sound effects are useful in teaching? For instance, can they help students concentrate?

Teacher E:
I think sound effects are useful. Sometimes when students get distracted, a suitable sound effect can actually draw their attention back.

Researcher:
I'd also like to ask about the design of the page borders. The revised courseware removed the uniform border, but some teachers feel that a consistent border helps create a sense of cohesion. What is your personal view?

Teacher E:
It doesn't really affect student learning. For our open classes, we are used to having borders with some patterns around the edges, but the central content area is pure white. This way, if the background is white, the text on it is clearer. Students mainly focus on the main content of the courseware, not the surrounding decorations.

Researcher:
When you notice students are not paying attention or are zoning out in class, what methods do you usually use to bring their attention back?

Teacher E:
Usually, they only get distracted for a brief ten or twenty seconds. In many cases, I don't need to specifically remind them. As long as I continue with the lesson and new content appears on the screen, they will naturally shift their focus back.

Researcher:
When do you find students are more engaged, and when are they more likely to get distracted?

Teacher E:
It's highly related to the content being taught. For example, during Story Time, they are very attentive because it's interesting. But if it's just learning sentence patterns, they are less enthusiastic. However, when it comes to learning songs or chants, they become more engaged again. So, whether the content itself is interesting is very important. Story Time is optional content, and many teachers don't really teach it because there are a lot of sentences, and if the story isn't captivating, the students don't want to listen.

Researcher:
From your teaching experience, what are the significant differences in cognition and learning between lower-grade and higher-grade students? What inspiration can this provide for our courseware design?

Teacher E:
There's a very clear difference. For example, students change a lot from third grade to sixth grade. Lower-grade students think in a more concrete and intuitive way. So, when designing courseware for them, the content must be very direct. Tell them exactly what something is, and avoid using too much suggestive or abstract language. For the lower grades, vibrant colours and strong animations are more effective at capturing their attention. By the time they reach the higher grades, the quality of the courseware itself has less of an impact on them.

Researcher:
When teachers receive the courseware, do they modify it to suit their own needs?

Teacher E:
They generally don't modify it much. Usually, I'll review it the day before class. If I feel I don't want to teach the content on a particular page or find it unsuitable, I just delete that page.

Researcher:
Finally, if you were to choose a unit from the upcoming second-grade curriculum to test the new courseware, what would you recommend?

Teacher E:
(After checking the table of contents) Unit 2 is about sports, and Unit 3 is about food. Comparatively, Unit 2 (sports) might be more suitable for you to revise and design than Unit 3 (food). In terms of timing, after the school year starts and we finish Unit 1, we will likely move on to Unit 2 around the end of September. Unit 3 would probably be in mid-October. This timeline seems quite suitable.

Interview Transcript Teacher F

Interviewer: Researcher
Interviewee: Teacher F

Researcher:
From your perspective as a teacher, what was the difference in experience between using this new courseware and the old version?

Teacher F:
I feel that the new courseware you created is more vivid and lively. The visuals and fonts are more eye-catching. You standardized the font sizes, which I think is a good thing; it looks more professional.

Researcher:
During use, were there any design details that you found convenient or inconvenient?

Teacher F:
Animations: The animations could be more streamlined. For example, in the phonetics section, the animation was a bit cumbersome with too many clicks required, which took up valuable practice time in the latter half of the class. I personally believe it›s best to have a uniform speed for animations, like 0.3 seconds. Only when explaining key and difficult points should the animation be deliberately slowed down or paired with special sound effects for emphasis.

Sound Effects: Special sound effects can capture students› interest, especially when some are distracted, helping to pull their attention back. However, they should be used sparingly, preferably only for key and difficult points, not on every page. Additionally, for reading audio, I would prefer a clickable speaker icon rather than having it auto-play when the page turns. This allows the teacher to control the timing; otherwise, students can be caught off guard.

Reading Guidance: The «little finger» animation in the courseware, meant to guide students› reading, felt cumbersome and slow. We teachers have our own reading pace and typically use a pointer to guide them in person, so I usually delete or skip that animation.

Researcher:
What was the students' reaction to the new visual elements, like the images, character designs, and so on?

Teacher F:
They noticed. Some students would ask, "Teacher, why has this picture changed?" They felt the new images and designs were prettier and more aligned with their tastes. If the courseware featured cartoon characters they recognized, like "Nobita," they would get more excited and participate more actively.

Researcher:
Regarding the images in the courseware, which do you think is more effective: using real photos or cartoon images?

Teacher F:
That depends on the difficulty of the teaching content. In pedagogy, we have a very important "principle of concreteness." If a concept is abstract and difficult to understand, using real photos is better because it's more direct and intuitive. If the content is simple, like the word "summer," then using some cartoon images to liven up the atmosphere is also great. For children, the most important thing is that the image helps them understand the content quickly and clearly.

Researcher:
What are your thoughts on the overall layout and colour scheme?

Teacher F:
Layout: The layout should be simple with a clear focus. For example, in one exercise page, the old version›s layout was more effective, with elements spread out on the left and right, making the focus clear. The new version clustered all the images together, which provided too much information for the children and felt complicated.

Colour: I don›t think the colour scheme—whether it's warm-toned or cool-toned—has a major impact on students' classroom reactions. Their responses are more about the teaching content and activities, not the overall colour. Of course, the colour combination must ensure clarity; for example, there should be enough contrast between the background and text so they don't blend together.

Researcher:
You've mentioned several principles from pedagogy and psychology. How do you apply these theories in your daily teaching and in your assessment of courseware?

Teacher F:
This theoretical knowledge is fundamental for us as education students and is very helpful for understanding and teaching children. For example, students in the lower primary grades (first and second grade) are in the "concrete operational stage" of cognitive development. Their understanding relies heavily on what they can see and hear, and they are not yet capable of complex abstract logical thinking. The critical period for this development is around the fourth grade. Therefore, courseware designed for lower-grade students must be extremely intuitive, concrete, and visual.

Researcher:
In your actual teaching, how do you adjust activities based on the classroom situation?

Teacher F:
Classroom interaction and games are crucial for maintaining students' attention. In my own classes, I use a reward system that runs throughout the entire lesson, like giving groups little red flowers, which effectively motivates them. If I notice students getting tired or distracted mid-lesson, I will spontaneously add interactive games, like a class-wide clapping game or a group reading competition. They also love the games in the courseware (like the spinner game) because they are fast-paced, efficient, and can instantly energize the atmosphere.

Researcher:
How do teachers typically modify and use existing courseware?

Teacher F:
When we modify courseware, we are almost always "subtracting" content; we rarely add new things ourselves. Therefore, it's better for the courseware to have more content that we can choose to delete, rather than too little content that requires us to add things. For example, I would delete sections that are too slow-paced or overly complicated. Sometimes, to improve efficiency, I'll even combine the content of two or three lessons into one and use the saved time for practice or review.

Researcher:
Overall, do you feel this revised courseware was helpful for your teaching?

Teacher F:
Yes, it was helpful. I can tell you put a lot of thought into the revisions for the students' benefit. When using your courseware, I felt more confident, and the students' reactions were more positive. At the same time, it's important to recognize that courseware has a limited impact on teaching outcomes. The final result still largely depends on the teacher's teaching style, their ability to adapt in the classroom, and how they choose to use the tool.

Phase 2 (FEEDBACK INTERVIEWS 1): detailed description of specific design guidelines

Based on the above categorisation of design insights, the corresponding supplementary insights obtained from FEEDBACK INTERVIEWS 1 are listed below:

Topic 1: (4) Reducing florid expressions for new content instruction

Effectively using visual hierarchy to highlight key information

Using a 'white background with high contrast' design can help highlight key content. This high-contrast visual hierarchy supports students in focusing their

attention, quickly identifying key information, and improving the clarity of the material.

Contrast between colours in content and the background is an effective strategy for optimising the visual hierarchy and directing students' attention to important elements.

Attention focuses on the most salient visual elements
Students typically first notice the most prominent visual elements on a screen and respond accordingly. This is especially true for Grade 2 students, whose understanding and reactions rely heavily on the visual salience of design elements.

Increased cognitive load when key information is not highlighted
When key information is not effectively emphasised visually, students need to invest more cognitive resources to process the content. This leads to a significant increase in cognitive load, which can reduce the overall effectiveness of classroom instruction and negatively affect comprehension and task performance.

Topic 1: (5) Support interactive activities, enhance voluntary attention

Potential distraction from overly attractive cartoon characters
Using popular cartoon characters can sometimes attract students' attention too strongly, diverting their focus away from the intended learning content. For example, when the goal is to guide students to focus on dialogue text, a highly appealing character design (such as Peppa Pig) may lead students to concentrate on the character's appearance instead of the textual information. This, to some extent, undermines the effectiveness of achieving the instructional objectives.

Visual salience: balancing appeal and instructional focus
It is crucial to ensure that decorative or illustrative elements do not overshadow the key information. If the design elements are more visually salient than the key learning content, they can interfere with information processing and comprehension.

This suggests that regardless of the methods used to capture students' attention, designers must first clarify the key information that should be

emphasized on each slide. Effective visual design should intentionally direct students' attention to key instructional content rather than merely relying on attention-grabbing features. If students focus solely on the engaging elements without naturally transitioning their attention to the learning material, then the design results in ineffective attention capture.

Game and interactive activities design

Competitive elements enhance learning motivation

- Incorporating competition-based activities into the classroom can effectively boost student engagement and interest.
- Games should not only be entertaining but should also facilitate students' language output, with particular emphasis on improving oral communication skills.

Fast-paced activities energise the classroom atmosphere

Maintaining a quick pace in games helps sustain students' enthusiasm and active participation, thereby creating a more active classroom atmosphere.

Frequency control to avoid diminishing returns

It is important to regulate the frequency of similar game activities. Overuse of the same type of game may lead to novelty fatigue, which can reduce student motivation and compromise the overall instructional effectiveness.

Topic 2: Motion graphics and situated learning in the classroom

Contextual relevance and alignment with students' life experiences

Relating to students' real-life experiences helps improve learning outcomes

- Scenarios designed to reflect students' daily life experiences are more likely to stimulate curiosity and interest in learning, promote positive cognitive engagement, and enhance comprehension.
- Scenarios that are highly relevant to students' lives can help students make associations more quickly and enhance their sense of immersion in the scenario.
- Regional cultural background and cognitive patterns need to be given consideration.

Scenarios not aligned with life experience can reduce comprehensibility

- If the motion graphics contains expressions or scenarios that do not match students' cognitive practices and life experiences, students need more time

to recognise and understand them, which may lead to less efficient reception of information
- It is not enough for the visual expressions used to be content-accurate; the localised design of the teaching context is as important.

Topic 3: Graphics and photos in visual expression

The graphic design must have a clear focus on key content, to avoid triggering unnecessary discussion or confusion among students.

Functional differences in different teaching stages, such as in reading aloud activities, the focus is on guiding students to imitate reading sentences aloud, the role of the graphics themselves is relatively small. At the stage when the learning scenario needs to be established, pictures and decorative graphics can enhance students' sense of immersion and interest, and help to achieve the teaching objectives.

Abstract or complex content is prioritised with photos to reduce the difficulty of students' understanding.

Combination of graphics, photos and text, language input support

- Graphics, photos and text pairing is a direct and effective way to input vocabulary and has wide applicability and positive effects in teaching and learning, whether or not it is combined with animation effects.
- Excessive and frequent use of photos or decorative graphics can diminish the prominence of the textual content as a key pedagogical element. This can lead to compromised performance in the knowledge output chain and impediments to the transfer of language skills.
- Graphics or photos that are highly matched and moderate to the text should be selected according to the teaching objectives to avoid excessive distraction of students by visual elements.
- Maintaining a strong link between graphics, photos and text can help students to better understand and remember vocabulary, improving the coherence of language input and output.

Topic 4: Instructions for modifying motion graphics

Teachers generally found the content of lesson plans to be complex and theoretical, making it difficult to translate them directly into classroom practice. This complexity reduces teachers' motivation and frequency in using lesson plans.

Integrating the contents of lesson plans into teaching materials helps to reduce repetitive operations. The teachers preferred to put the modification instruction of motion graphics into the ‘notes’ of the PowerPoint without the need to show it separately in the lesson plan.

Topic 6: Intuitiveness of visual expression

Primary school students (especially in grades 1 and 2) rely heavily on intuitive sensory stimuli to process information: for example, seeing a picture of the ‘sun’ is directly associated with ‘hot weather’. Many students do not know how to understand or respond to information if it is only in text, and need to use pictures or visual elements to help them understand.

Topic 8: Text

In terms of text design, although uniform font size and typeface can improve overall aesthetics, teachers care more about readability and whether the information is clear.

Topic 9: Colour

Brightness and visual comfort

- Teachers generally prefer using colours with higher brightness levels, as brightness directly affects students’ visual comfort.
- High-saturation colours can appear glaring to students sitting in the front rows.
- Large areas of bright red are discouraged.
- Fluorescent colours are also perceived as too harsh for students’ eyes.

If students dislike the colours used, they tend to lose interest in the lesson.

Emotional effects of different colour tones

Students have varying emotional responses to different colours. Colours that match the scenario can help them understand and engage with visual content more effectively.

Colour and the teaching environment

- The colour of motion graphics should consider the surrounding teaching environment, especially whether it blends too closely with surrounding colours (e.g., blackboards or projection screens).
- Greenish tones are generally less favoured by students because they are

too similar to the slight green tint of traditional classroom blackboards, which can cause visual fatigue and reduce a sense of freshness.
- Colours of visual elements that are too similar to the slide background can lower visual hierarchy and distract students' attention.
- Students tend to prefer 'cool' tones (especially blue).

Complexity of colour combinations

If the colour combinations in slides are too complex or overly bright, students may find it challenging to process visual information, which can affect their understanding of the teaching content.

Teachers' practical practices and limitations

- Although colour can affect classroom engagement, teachers generally perceive its impact as relatively weak and rarely adjust colours intentionally:
- Students pay more attention to teaching content and classroom interaction than to colour design.
- Even when teachers modify motion graphics, they seldom adjust colour schemes due to a lack of technical skills and time for colour optimisation.

The test results showed that students generally accepted the different colour schemes, with no strong negative reactions. Among them, 'cool' tones, especially blue, are the most preferred. Teachers suggested this might be because blue gave a 'fresh' feeling and created a strong contrast with the black text and colourful visual elements (e.g., images and icons), making the content clearer and easier to read.

In contrast, green was less preferred. Teachers noted that dark green backgrounds looked too similar to the blackboard, making students feel the screen content wasn't clear or visually engaging.

In PROTOTYPE 2, design changes were made to reduce the potential influence of colour cues on students' judgement. Teachers did not observe any major differences in students' reactions or answer accuracy between the contrast designs.

Based on the above, PROTOTYPE 3 focused on further testing colour schemes through three attempts:

- Testing different brightness levels of blue, exploring how light and dark shades of blue affect student acceptance and clarity.
- Trying other cool colours, comparing other cool tones (like teal or bluish

purple) to see if students also prefer them.
- Using high-contrast colours, testing colour schemes that strongly contrast with the classroom setting to see if contrast (not just 'cool' tones) improves visibility and student engagement.

Topic 10: Sound

Sound effects and voice-overs in attention regulation

Enhancing immersion and situational awareness
- Sound effects and character voice-overs can significantly improve students' sense of immersion.
- Character dialogues make students feel as if 'the story characters are speaking to them,' increasing classroom realism and engagement.

Providing direct language input support
- Compared to relying solely on teacher explanation, voice-overs and sound effects offer direct exposure to pronunciation, intonation, and other language inputs, especially beneficial for oral language teaching.
- Diverse audio resources supplement teaching methods and help improve the quality of students' language input.

Using environmental sounds to reinforce scenario-building and visual information
- Environmental sounds (e.g., door closing, page turning, footsteps) enhance scene authenticity.
- Such sounds serve as a complement to visual information, drawing students' attention and boosting classroom participation.

Control and flexibility are key to effective audio use
- Audio should allow operational control, especially in reading-aloud segments; if voice-overs cannot be paused or adjusted, they may disrupt the teacher's control over lesson pacing and hinder learning objectives.
- In design, it's important to distinguish between contextual sound effects and content narration to ensure each serves its intended purpose.

Supplementary topic 1: motion effects trigger controls

When using automatic appearance, the following should be considered:

- When a large amount of information appears on the slide simultaneously, students may struggle with information processing and experience cognitive overload.
- Presenting content all at once makes it difficult for students to identify key points quickly. This can lead to confusion and a loss of focus when trying to follow the lesson.
- In automatic sequential presentations, step-by-step automatic appearance helps guide students' attention progressively, reducing the burden of processing too much information at once.
- Step-by-step automatic appearance can effectively reduce misunderstanding and improve accuracy in task comprehension and execution.

Design strategies:

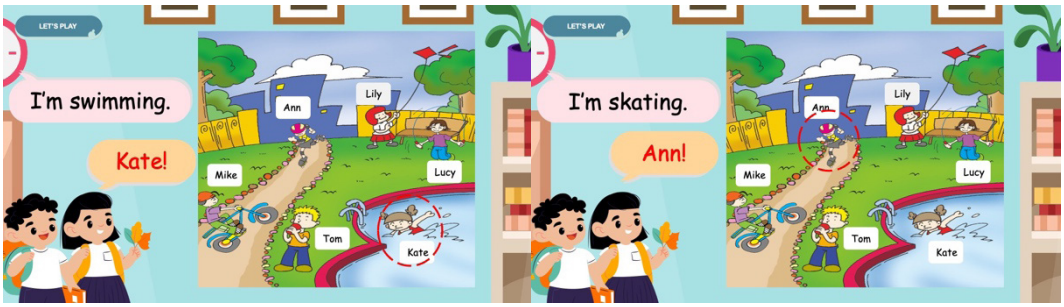
- Controlling the sequence and pace of motion effects and information presentation is key to reducing cognitive load and improving comprehension and students' attention.
- For tasks requiring student's behavioural participation, such as words classification or reading, gradual presentation combined with focus guidance is an effective design approach.

PROTOTYPES 3

Design Prototypes 3 is based on the same current teaching materials (Grade 2, Semester 1, Unit 5), presenting:

Lesson 1:




LET'S PLAY
I'm swimming.
Kate!
Ann
Lily
Mike
Lucy
Tom
Kate

LET'S PLAY
I'm skating.
Ann!
Ann
Lily
Mike
Lucy
Tom
Kate

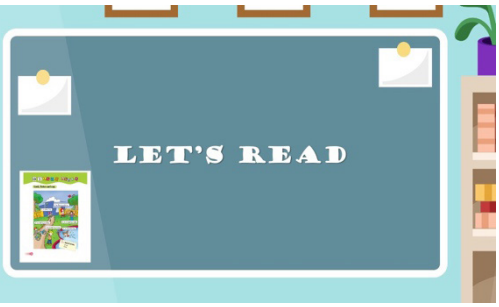

LET'S PLAY
I'm riding a bike.
Mike!
Ann
Lily
Mike
Lucy
Tom
Kate

LET'S PLAY
I'm flying a kite.
Lily!
Ann
Lily
Mike
Lucy
Tom
Kate

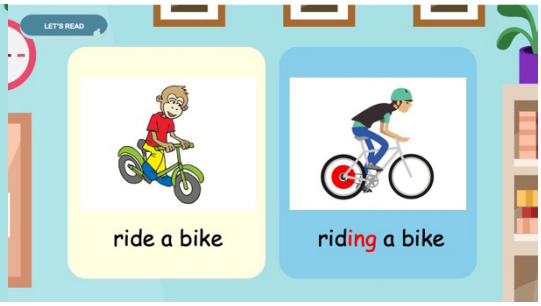

LET'S PLAY
I'm skipping rope.
Lucy!
Ann
Lily
Mike
Lucy
Tom
Kate

LET'S PLAY
I'm drinking Coke.
Tom!
Ann
Lily
Mike
Lucy
Tom
Kate


Coke
Coke
I'm drinking Coke.


LET'S READ


LET'S READ
发现了吗？
每句话都有一个小尾巴ing，
它表示正在做某事。
I'm skating.
I'm flying a kite.
I'm riding a bike.
I'm skipping rope.
I'm swimming.
I'm drinking coke.

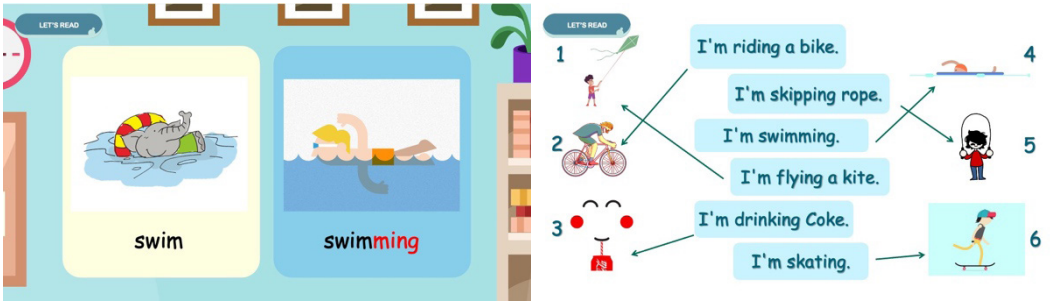

LET'S READ
ride a bike
riding a bike


LET'S READ
skate
skating


LET'S READ
fly a kite
flying a kite


LET'S READ
skip rope
skipping rope
LET'S READ
play the piano
playing the piano

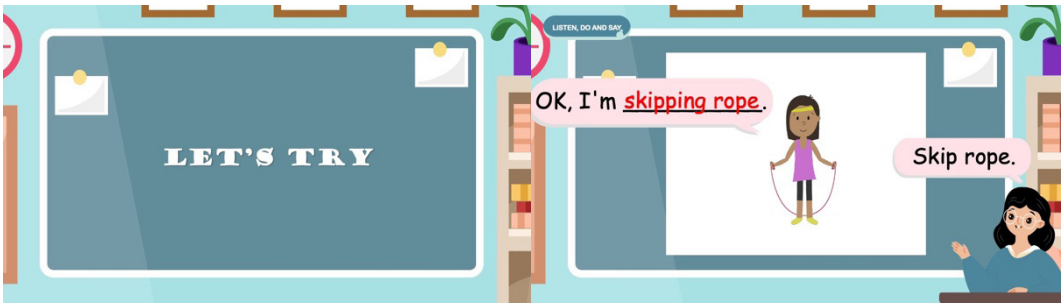

LET'S READ
dance
dancing
LET'S READ
draw
drawing


LET'S READ
swim
swimming
LET'S READ
1
I'm riding a bike.
2
I'm skipping rope.
I'm swimming.
I'm flying a kite.
3
I'm drinking Coke.
I'm skating.
4
5
6


LOOK AND SAY
I'm skipping rope.
What are you doing, Peppa?
LOOK AND SAY
What are you doing, George?
I'm eating.


LOOK AND SAY
I'm riding a bike.
What are you doing, Peppa?
LOOK AND SAY
I'm flying a kite.
What are you doing, George?


LOOK AND SAY
I'm dancing.
What are you doing, Peppa?
LOOK AND SAY
What are you doing, George?
I'm drinking.


LET'S TRY
LISTEN, DO AND SAY
OK, I'm skipping rope.
Skip rope.

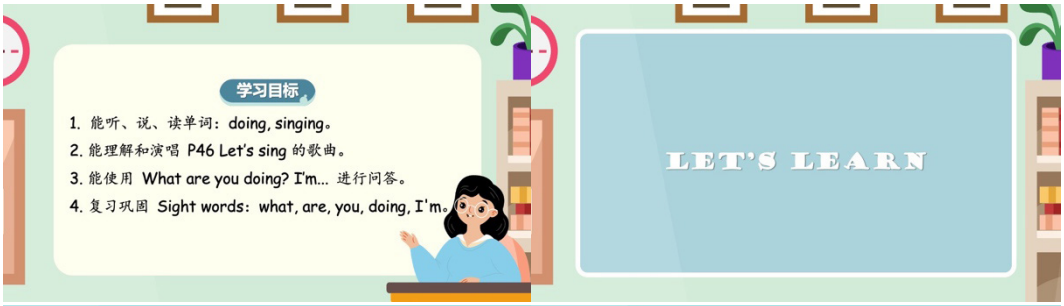

LET'S SUM UP
学习小结
我们学了这些词：
drink
Coke


学习小结
我们学习了第44页的课文
学习小结
我们学习了一个小尾巴ing表示正在做什么。
riding a bike
skating
flying a kite
skipping rope
swimming
drinking Coke

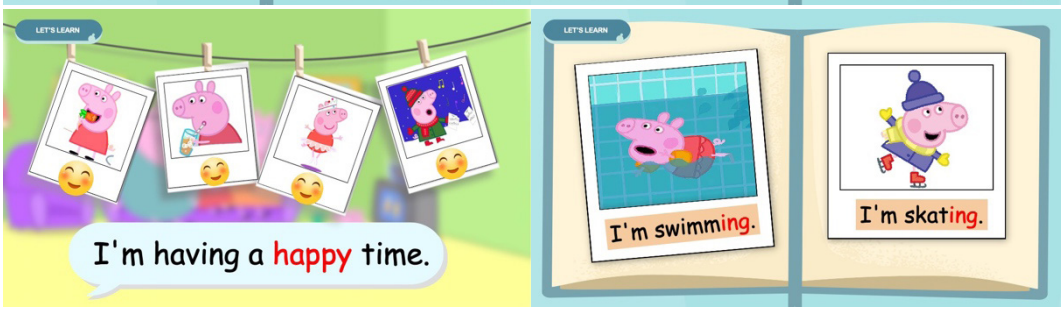

学习小结
I'm drinking.
I'm riding a bike.

Lesson 2:
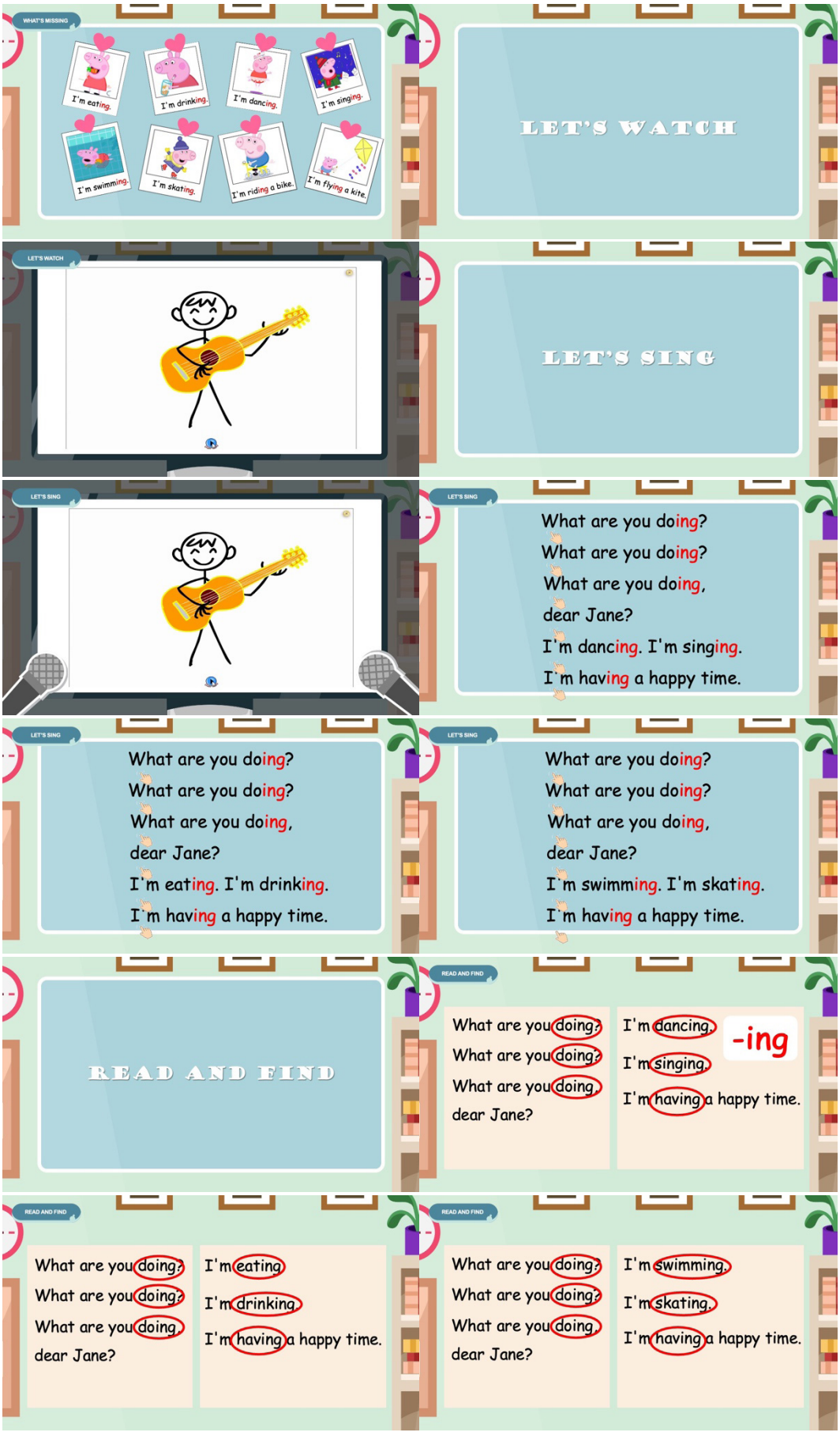

UNIT 5 I'M SKATING
PERIOD 2
学习内容
UNIT 5
I'M SKATING
P46 LET'S SING


学习目标
1. 能听、说、读单词：doing, singing。
2. 能理解和演唱 P46 Let's sing 的歌曲。
3. 能使用 What are you doing? I'm... 进行问答。
4. 复习巩固 Sight words: what, are, you, doing, I'm。
LET'S LEARN


LET'S LEARN
I'm eating.
I'm drinking.
I'm dancing.
I'm singing.


LET'S LEARN
I'm having a happy time.
I'm swimming.
I'm skating.


LET'S LEARN
I'm riding a bike.
I'm flying a kite.
I'm having a happy time.


WHAT'S MISSING
I'm eating.
I'm drinking.
I'm dancing.
I'm singing.
I'm swimming.
I'm skating.
I'm riding a bike.
I'm flying a kite.
LET'S WATCH
LET'S WATCH
LET'S SING
LET'S SING
LET'S SING
What are you doing?
What are you doing?
What are you doing,
dear Jane?
I'm dancing. I'm singing.
I'm having a happy time.
LET'S SING
What are you doing?
What are you doing?
What are you doing,
dear Jane?
I'm eating. I'm drinking.
I'm having a happy time.
LET'S SING
What are you doing?
What are you doing?
What are you doing,
dear Jane?
I'm swimming. I'm skating.
I'm having a happy time.
READ AND FIND
READ AND FIND
What are you doing?
What are you doing?
What are you doing,
dear Jane?
I'm dancing.
I'm singing.
I'm having a happy time.
-ing
READ AND FIND
What are you doing?
What are you doing?
What are you doing,
dear Jane?
I'm eating.
I'm drinking.
I'm having a happy time.
READ AND FIND
What are you doing?
What are you doing?
What are you doing,
dear Jane?
I'm swimming.
I'm skating.
I'm having a happy time.


LET'S TRY
LET'S SING
What are you doing?
What are you doing?
What are you doing,
dear Jane?
I'm . I'm .
I'm having a happy time.
LET'S SING
What are you doing?
What are you doing?
What are you doing,
dear Jane?
I'm . I'm .
I'm having a happy time.
LET'S SING
What are you doing?
What are you doing?
What are you doing,
dear Jane?
I'm . I'm .
I'm having a happy time.
LOOK AND SAY
LOOK AND SAY
What are you doing, Lucy?
Li Hua
I'm dancing.
LOOK AND SAY
What are you doing, Bobby?
I'm playing the piano.
LOOK AND SAY
Are you having a happy time?
What are you doing, Sammy?
Yes, I'm having a happy time.
I'm riding a scooter.
LOOK AND SAY
Are you having a happy time?
What are you doing, Jerry?
Yes, I'm having a happy time.
I'm eating.
LOOK AND SAY
Are you having a happy time?
What are you doing, Sammy?
Yes, I'm having a happy time.
I'm washing the dog.
LOOK AND SAY
Are you having a happy time ?
What are you doing, Andy?
I'm flying.
No, I'm scared!
READ ALOND
s playingg
drplayig


LET'S SUM UP
学习小结
1. 我们学了P46的歌曲。
学习小结
2. 我们学了用 What are you doing?
询问对方正在做什么
What are you doing, Jerry?
I'm eating.
学习小结
2. 我们学了用 What are you doing?
询问对方正在做什么。
What are you doing, Jerry?
I'm eating.
学习小结
3. 我们学了用 I'm having a happy time.
表达自己很开心。
I'm drawing.
I'm having a happy time.

Lesson 3:


UNIT 5 I'M SKATING
PERIOD 3
学习内容
I'M SKATING
P45 LET'S PLAY &
P48 LET'S TALK
学习目标
1. 能就正在发生的行为进行问答：Are you ...? Yes, I am. / No, I'm not.
2. 能认读：am, not。
3. 能理解和朗读P48对话。
4. 复习巩固 sight words: what, are, you, I'm, doing 及现在分词。
SIGHT WORDS TIME
Jump in Muddy Puddles
What are you doing?
Are you dancing?
LET'S LEARN
Yes, it's me.
Are you flying a kite?


Yes, it's me.
Are you flying a kite?

Yes, I am.


No, I'm not.
I'm watching TV.
Are you playing the piano?


Yes, it's me.
Are you drawing?

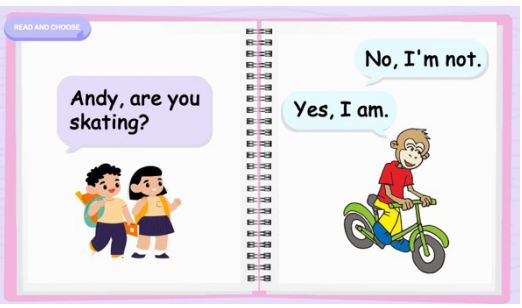

Yes, I am.


Yes, it's me.
Are you riding a bike?


No, I'm not.
I'm running.

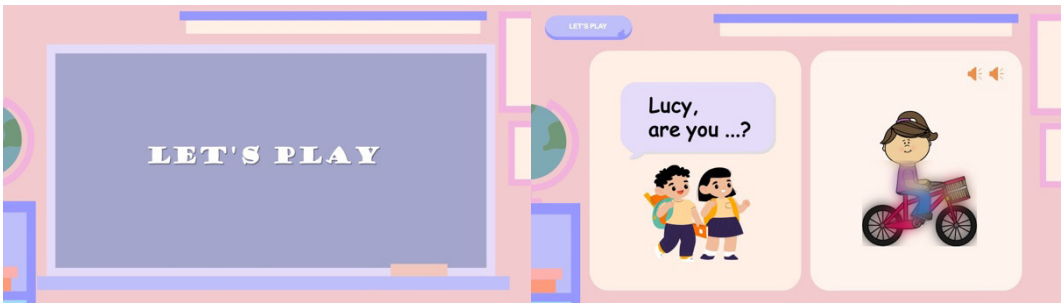

READ AND CHOOSE


READ AND CHOOSE
Amy, are you skipping rope?
No, I'm not.
Yes, I am.

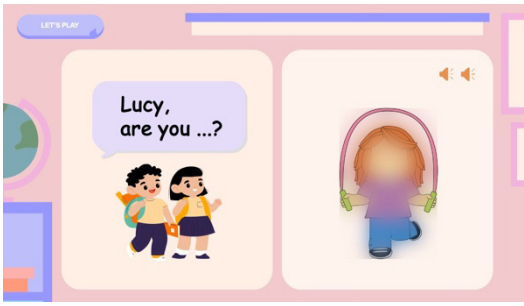

READ AND CHOOSE
Andy, are you skating?
No, I'm not.
Yes, I am.


READ AND CHOOSE
Koto, are you flying a kite?
No, I'm not.
Yes, I am.

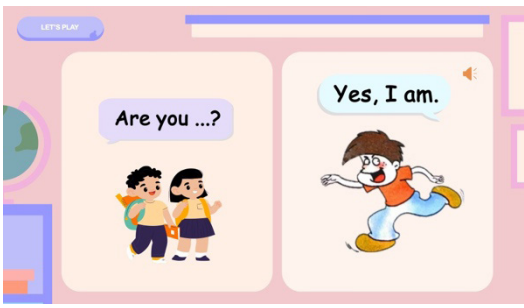

READ AND CHOOSE
Andy, are you dancing?
No, I'm not.
Yes, I am.

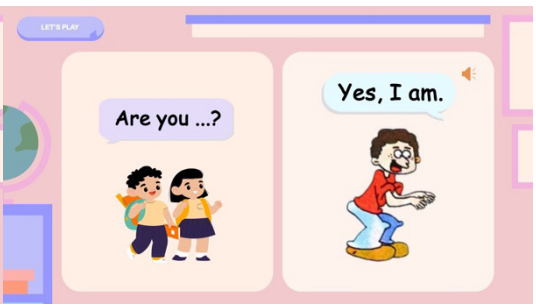

LET'S PLAY

LET'S PLAY
Lucy,
are you ...?


LET'S PLAY
Lucy,
are you ...?


LET'S PLAY
Koto,
are you ...?


LET'S PLAY
Are you ...?
Yes, I am.


LET'S PLAY
Are you ...?
Yes, I am.


LET'S READ


LET'S READ
Are you riding a bike?
Are you skating?
No, I'm not.
Yes, I am.
Are you skating?
Are you swimming?
No, I'm not.
Yes, I am.


LOOK AND GUESS


LOOK AND GUESS
What are you doing, Koto?


LET'S WATCH



LET'S READ



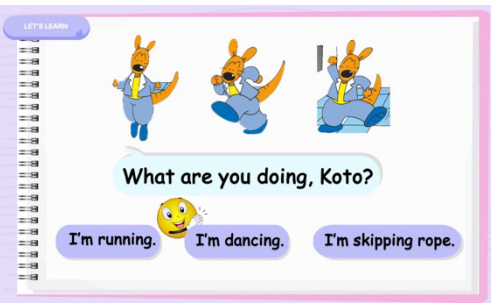














LISTEN AND REPEAT










LET'S LEARN
I'm a poor dancer.
SIGHT WORDS TIME

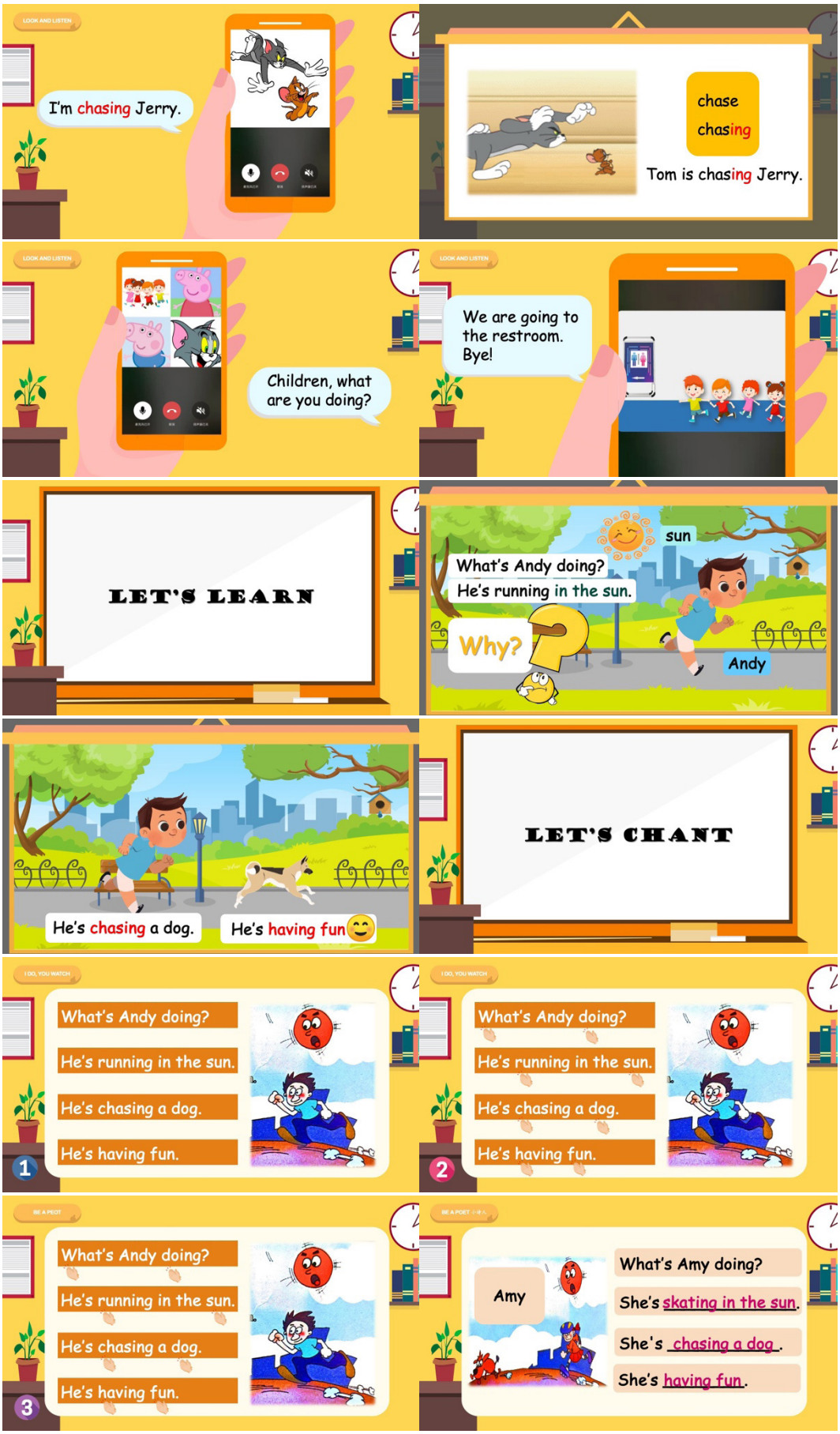

SIGHT WORDS TIME
Are you drawing? Yes, I am.
am
Are you riding a bike?
No, I'm not. I'm dancing.
not
Are you swimming? Yes, I am.
LET'S SUM UP


LET'S CUM UP
学习小结
1. 我们学习了新单词 am, not
am
not
LET'S CUM UP
学习小结
2. 我们学习了用下面的句型就正在发生的行为进行问答。一起做了 P45 的游戏。
Are you eating?
Yes, I am.


LET'S CUM UP
学习小结
3. 我们学习了P48页的对话。

Lesson 4:


UNIT 5 I'M SKATING
PERIOD 4
学习内容
UNIT 5
I'M SKATING
P47 LET'S CHANT
学习目标
1. 能巩固认读已学单词: doing, what's, I'm, he's, she's和ing 动词。
2. 能听说读新单词 sun, chase 并能理解其意义。
3. 能理解和朗读小诗。
4. 能尝试用 What's... doing? He's / She's... 谈论他人正在进行的活动。
LET'S LOOK BACK
LOOK AND LISTEN
What are you doing, Peppa?
I'm skating.
What are you doing, Geoge?
I'm flying a kite.
What are you doing, Tom?


LOOK AND LISTEN
I'm chasing Jerry.
chase
chasing
Tom is chasing Jerry.
LOOK AND LISTEN
Children, what are you doing?
LOOK AND LISTEN
We are going to the restroom. Bye!
LET'S LEARN
sun
What's Andy doing?
He's running in the sun.
Why?
Andy
He's chasing a dog.
He's having fun
LET'S CHANT
I DO, YOU WATCH
What's Andy doing?
He's running in the sun.
He's chasing a dog.
He's having fun.
1
I DO, YOU WATCH
What's Andy doing?
He's running in the sun.
He's chasing a dog.
He's having fun.
2
BE A POET
What's Andy doing?
He's running in the sun.
He's chasing a dog.
He's having fun.
3
Amy
What's Amy doing?
She's skating in the sun.
She's chasing a dog.
She's having fun.


BE A POET 小诗人
Amy
What's Amy doing?
She's skating in the sun.
She's chasing a dog.
She's having fun.
CHANT AND CLAP
What's Amy doing?
She's skating in the sun.
She's chasing a dog.
She's having fun.
Amy
LET'S WATCH
LET'S READ
What's Andy doing?
He's running in the sun.
He's chasing a dog.
He's having fun.
LET'S READ
Amy
What's Amy doing?
She's skating in the sun.
She's chasing a dog.
She's having fun.
LET'S TRY
创编小诗
LOOK AND SAY
What's Jerry doing?
He's eating in the sun.
He's eating the chicken.
He's having fun.
Jerry
LOOK AND SAY
What's Tommy doing?
He's playing in the sun.
He's washing the dog.
He's having fun.
Tommy
LOOK AND SAY
What's Peppa doing?
_____.
_____.
_____.
George
Peppa
LOOK AND SAY
What's Peppa doing?
She's running in the sun.
She's chasing George.
She's having fun.
George
Peppa



Final themes, subthemes and codes (FEEDBACK INTERVIEWS 2)

Theme 1: Attention Regulation and Visual Load Management

Integrated Code 1:
Dynamic and visual elements play a dual role in students' attention: they can attract attention but may also cause distraction and interfere with teaching

Included original codes:
* Animated images re-attract students' attention
* When there are too many dynamic effects, students stop listening to the teacher
* Repetitive looping animations gradually lose students' interest, especially when the effects are not engaging
* In practice, review and attention-capturing often occur at the same time
* Images attract attention but easily cause distraction
* Students tend to focus more on visual images and may even engage in additional discussions
* Teachers' guidance usually gains students' attention more effectively than looping animations
* Teachers find that static elements are less engaging, while dynamic elements attract students more
* Teachers believe that motion graphics have limited impact at the end of class; smooth transitions are sufficient

Integrated Code 2:
Courseware color design should avoid overly bright or light colors to maintain visual comfort and reduce students' cognitive burden.

Included original codes:
* It is recommended to reduce color saturation to alleviate visual load
* Bright colors have negative effects on students' visual perception
* Teachers emphasize avoiding overly bright yellow
* Teachers consider colors such as yellow and red to be visually harsh
* Teachers value color schemes that reduce eye strain
* The new courseware uses warmer colors, which are visually more comfortable
* Text colors should not be too light
* Background and text colors affect the presentation of key information

Integrated Code 3:
Colors and patterns are highly attractive to lower-grade students, but students pay more attention to patterns than to background colors.

Included original codes:
* Students prefer brightly colored courseware
* Students prefer blue
* Patterns are more attractive than colors to lower-grade students
* Students focus on patterns rather than background colors

Integrated Code 4:
Audio and video elements help maintain students' attention in the middle and later stages of a lesson.**

Included original codes:
* Videos placed in the middle of the lesson help students maintain attention
* When songs are accompanied by videos, the visual content becomes more attractive
* Children's voices attract students' attention more than adult voices

Theme 2: The Influence of Font Design on Reading Recognition and Writing Transfer

Integrated Code 1:
Differences between courseware fonts and textbook fonts create cognitive conflicts, requiring a balance between consistency and legibility.

Included original codes:
* Fonts used in motion graphics are different from textbook fonts
* Using fonts in PPT that differ from textbooks creates contradictions
* Teachers suggest matching motion graphics fonts with textbook fonts, but this may affect letter recognition
* When fonts match the textbook, students form cognitive connections
* Changes in textbook fonts may affect the font choices in motion graphics

Integrated Code 2:
Font clarity and style affect students' spelling, word recognition speed, and writing habits.

Included original codes:
* Use "wooden-stick style" fonts to enhance interest and clarity
* Consistent font design improves writing efficiency
* Font usage affects students' writing
* Fonts influence vocabulary recognition speed
* Font habits affect how quickly students distinguish letters and words
* Font usage shapes students' visual habits, which in turn influence writing style

Integrated Code 3:
Teachers consider curriculum continuity and instructional goals when selecting fonts, avoiding frequent changes that require students to re-adapt.

Included original codes:
* Font choice largely depends on teaching content and whether writing is being taught
* Some teachers consider alignment with higher-grade fonts when changing fonts
* Font changes require students time to re-familiarize themselves
* New fonts can be used, but students need time to adapt
* Teachers intentionally avoid using printed fonts in PPT design
* Teachers provide diverse reasons for font selection
* Different regions and schools have different curriculum requirements, leading to different font needs

Theme 3: Interaction Mechanisms and Teacher Guidance Strategies

Integrated Code 1:
Interactive methods such as triggers, songs, and games enhance student participation and classroom effectiveness.

Included original codes:
* Multiple trigger designs enable character interaction
* Integration of physical games with PPT
* Songs are considered interactive activities
* Interaction is necessary; motion graphics can include interaction design without excessive concern about distraction, as teachers can control the degree of interaction
* Teachers emphasize that strong interaction should involve students' real physical actions

Integrated Code 2:
Teachers guide students' attention and control classroom pace through preset animation sequences and instructional prompts.

Included original codes:
* Animation sequences anticipate student responses
* Preset animations are designed to guide students' answers
* Teachers introduce lesson content based on student responses
* Teachers follow students' ideas and then guide them further
* Teachers emphasize that intuitive teaching methods are most suitable

Theme 4: Consistency Between Courseware Structure and Teaching Strategies

Integrated Code 1:
Teachers emphasize alignment between teaching objectives, design processes, and trial feedback during courseware development, valuing scenario construction and instructional adaptability.

Included original codes:
* PPT development often involves trial use, revision, and then large-scale application
* PPT production and scenario design should be based on instructional design
* Teachers need both technical skills and classroom adaptability
* Lesson plans usually appear in demonstration classes but have limited reference value for real classrooms
* Designers find it difficult to predict how teachers will actually use the materials
* Teachers believe motion graphics cannot meet large-scale universal needs because student responses are unpredictable

Integrated Code 2:
*The new Prototype 2 courseware is closer to students' daily life and improves comprehension and attention distribution.

Included original codes:
* The green used in Prototype 2 is relatively dark
* Prototype 2 still triggers additional student discussions, which may be unavoidable
* Teachers believe different types of graphics in Prototype 2 are used appropriately
* Prototype 2 is more intuitive than previous versions
* The visual elements in Prototype 2 better match students' life experiences
* Compared with older designs, Prototype 2 is more attractive to students
* Teachers believe the new design of Prototype 2 is clearer than the old version
* Teachers agree with the motion graphics design in Prototype 2 regarding attention distribution

Theme 5: Language Development and Classroom Behavioral Responses of Lower-Grade

Students

Integrated Code 1:
*Lower-grade students mainly rely on imitation; their output is evaluated through teacher observation, with short attention spans and frequent topic deviation.

Included original codes:
* Grade 2 courses focus on stimulating interest in language learning, exposure to English, and imitation of pronunciation
* Vocabulary in Grade 2 courses mainly consists of concrete nouns
* In second-language learning, lower-grade students rely mainly on imitation and involuntary attention
* In second-language acquisition, Grade 2 students are primarily imitation-oriented
* Forms of output
* Interaction among lower-grade students is simple and direct
* Output performance is not obvious because attention decreases and cognitive abilities are still developing
* Teachers judge output mainly through observing students' responses
* Young age leads to easy shifts in attention
* Teachers believe theoretical explanations of teaching objectives are more effective for higher-grade students and less effective for lower grades

Integrated Code 2:
Students are more likely to lose focus in the second half of class due to boredom or limited language ability rather than fatigue; moderate topic deviation may support understanding.**

Included original codes:
* Teachers believe students' inattention in the latter half of class is more due to boredom than fatigue
* Some teachers hide instructional objectives to prevent loss of interest and to create suspense and curiosity
* Familiar content triggers topic deviation but deepens understanding
* Limited language ability leads to topic deviation
* Mild topic deviation helps connect language learning with real life
* Teachers believe lower-grade students often engage in irrelevant discussions due to motion graphics content

Theme 6: Fun-Oriented Design and Maintenance of Student Learning Motivation

Integrated Code 1:
Teachers use fun-oriented design to strengthen review and practice stages, enhancing learning motivation and maintaining classroom focus.

Included original codes:
* In current materials, practice sections often focus heavily on drilling and may become boring
* Vocabulary learning usually involves repeated practice in different formats
* Review is necessary, but since the content is already learned, fun methods are often used to prevent loss of interest
* Review activities are usually designed to be interesting to attract attention
* Teachers believe changes in practice methods are driven more by the need for repetition than by fun
* Teachers believe that even repetitive practice must consider fun, otherwise students will lose interest
* Teachers find that using the fun aspects of motion graphics is necessary to attract attention,

but it may also cause unnecessary discussions

Interview transcript (FEEDBACK INTERVIEWS 2)

Interview Transcript Teacher A

Interviewer: Researcher
Interviewee: Teacher A

Researcher:
Hello, Teacher A. I'd like to talk about your experience using the new courseware this time. What differences did you notice compared to before?

Teacher A:
My experience this time was indeed quite different. Previously, I was making a comparison in a second-grade class during their second semester. Those students had been with me for half a semester, so the contrast between the old and new courseware was very clear. This time, I'm teaching first-graders who are new to the school, and I've had to re-establish many of their classroom habits.

The most prominent difference this time is this: these first-grade students are easily captivated by the cute pictures in the courseware, but their attention is also extremely easily diverted by these same pictures to things outside the lesson. For instance, when they see a picture with someone riding a bike or flying a kite, they immediately relate it to themselves, saying, "I can ride a bike too!" or "I've never flown a kite before," and start thinking about many things unrelated to the class. The pictures do attract their attention, but this attention quickly shifts.

In contrast, students in the second semester of second grade, being a bit older and more mentally mature, would also be attracted to the pictures, but their discussions would remain within the scope of the classroom topic. The first-graders are younger, so when they see cute pictures and bright colours, their minds tend to wander. So, while the courseware can attract them, the teacher needs to expend extra effort to pull their attention back to the content. This is the most significant difference.

Researcher:
So, you're saying that even if the pictures in the courseware are relevant to the lesson content, first-grade students are still prone to going off-topic?

Teacher A:
Yes. He clearly knows the teacher is showing the picture to discuss a certain topic, but he can't help but think of other things related to himself and say them out loud. There are two main reasons for this: first, their young age, and second, their relatively weaker sense of discipline. They say whatever interesting thing comes to mind.

However, these pictures and animations are genuinely effective at capturing their attention. For example, when they get tired in the first half of the class, a sudden appearance of an interesting picture or an animated GIF will immediately bring their focus back to the classroom. Although they might uncontrollably say something off-topic, the teacher can then use their words to skilfully guide them back to the lesson's theme.

Researcher:
Is there really such a big difference in students' cognitive and disciplinary maturity with just a one-semester gap?

Teacher A:
Yes, the difference is quite noticeable. An additional semester of learning isn't just about gaining more knowledge. After four months of school life, their minds mature, and their discipline improves through practice. They become more aware of the teacher's expectations, knowing what the teacher wants them to say and not say, and they can better control their own classroom behaviour.

Researcher:
When students become familiar with your teaching style and classroom procedures, do they become less engaged due to a lack of novelty?

Teacher A:
On the contrary, I don't think so. With both my previous and current classes, as they become more familiar with my routine, their reactions don't become negative. This is because the courseware itself is designed to be diverse; you don't use the same presentation method for several consecutive lessons. For instance,

this lesson might use one type of interaction, and the next might use another. Furthermore, even if it's the same game (like popping bubbles), a different background image creates a different feel for them. We only have two English classes a week, so for them, these activities and scenarios remain very interesting, and the sense of novelty is always there.

Researcher:
Regarding the courseware content, if you use pictures of life scenarios familiar to the students, does that make them more likely to go off on tangents? Is this a serious problem?

Teacher A:
I wouldn't call it a serious problem. When students see familiar scenes, they do share some of their own experiences, but these "off-topic" remarks can actually help them better understand the teaching content because it connects with their own lives. This behaviour is characteristic of their age group and is actually beneficial for their application of English and comprehension of sentences.

Moreover, this situation usually only occurs the first time they encounter a picture. For example, in a lesson about "ways to go to school," they get very excited and discuss it when they first see pictures of various vehicles. But when these pictures reappear, they no longer go off-topic because the novelty has worn off, and they already know what English words to use. Initially, they speak in Chinese, partly because they are young and can't control themselves, and partly because they don't know how to say it in English yet. But after the teacher has taught them, they will naturally try to express themselves in English when they see similar pictures again.

Researcher:
As a teacher, how do you typically handle it when students go off-topic?

Teacher A:
I go with the flow and guide them. For example, if a picture shows many children doing activities and a student says, "I can swim too," I will affirm them by saying, "Oh, you can swim too, that's great!" and then shift the focus back to the picture: "Now let's see what the children in the picture are doing." You first follow their lead, then steer them back to the lesson. With younger children, you can't be as direct as you would with older students; you have to work with their comments, pick up on keywords, and guide them back to the teaching content. It's actually not difficult to handle.

Researcher:
Besides the issue of student attention, have you encountered any other problems while using the courseware?

Teacher A:
The main issues arise when I try to modify the courseware. Some designs in the original courseware have a specific purpose, like the particular way a sentence or word appears, which is intentionally designed by the teacher to create suspense and guide students' thinking. For example, showing a picture first and leaving some time for students to recall or think of the corresponding word before revealing the text.

However, during the modification process (like replacing a picture), the animation effects and sequence in the PowerPoint are easily disrupted. After making a change and playing it, I find that the pop-up order of the elements is different from what I intended. This is a common problem we face even when preparing our own lessons.

Researcher:
Yes, sometimes a file looks fine on my computer but the formatting gets messed up after I send it to you.

Teacher A:
Exactly, and this affects the flow of the lesson. A fixed animation sequence essentially presets the students' reaction path. But students' real reactions are varied. For instance, during a Q&A session, a student might ask a question we hadn't anticipated. In such cases, a fixed animation sequence isn't flexible enough.

Therefore, a more ideal design would use the "trigger" function in PowerPoint. The teacher could click on different areas based on the students' live reactions to provide different, immediate feedback. For example, if Peppa Pig in the courseware is supposed to talk to the students, we could preset several possible student answers and create different triggers. When clicked, Peppa would say different things in response. This would make the students feel like they are truly interacting with Peppa. Of course, when technology is limited, the teacher has to rely on their own verbal flexibility to handle things.

Researcher:
Is it complicated to preset responses for younger students?

Teacher A:
No, for students of this age, the response options provided are usually very simple, basically “Yes/No” or simple multiple-choice questions. For example, if you ask “Do you like it?”, the answer is either “Yes, I do” or “No, I don’t.” So it’s relatively easy to manage.

Researcher:
Did the students have any feedback on the graphics and colours in this version of the courseware?

Teacher A:
Not this time. Because they are younger, their focus is mainly on whether the “pattern” itself is cute and interesting, and they don’t pay much attention to the overall “colour scheme.” The previous second-graders had clear preferences; they liked blue and thought red was too glaring. But this new group of students hasn’t developed that kind of awareness yet and doesn’t compare the styles of the new and old courseware.

Researcher:
Regarding fonts, I heard there are new requirements for them in teaching?

Teacher A:
Yes, but mainly starting from the third grade. The new third-grade textbook requires the use of a more standard print-style font, whereas in first and second grade, we still use a rounder, handwriting-style font in our classroom PowerPoints.

This actually creates a contradiction: the textbook uses a print font, but the teacher requires students to write in a handwriting style. This can be confusing for students, and some might even try to imitate the print font from the textbook. So, as teachers, we have to repeatedly explain to them: “The words in the book are typed on a computer, but what you need to write is the handwriting style, like what the teacher writes on the PowerPoint or the blackboard.”

Researcher:
In your opinion, what is the impact on students of using a different font in the PowerPoint than in the textbook?

Teacher A:
It mainly affects two things: first, their word recognition speed, and second, their writing habits. If they are used to one font, their cognitive reaction is faster. At the same time, they subconsciously imitate the font they see when they are learning to write.

Researcher:
So, how do you think fonts should be considered in courseware design?

Teacher A:
I believe that in the first and second grades, when students are learning to write, the PowerPoint should use a font that is consistent with their handwriting standard. By the third grade, their handwriting is generally established, so a print font that matches the textbook can be used to aid their reading.

Researcher:
Next, I’d like to discuss the design of animations in the courseware. Are there any points to be aware of when using animations in the classroom?

Teacher A:
I think the most important principle is: **Do not have too many elements moving at the same time on one page.**

If there is only one animated element on a PowerPoint slide, it can immediately capture the attention of all the students. But if a picture has seven or eight characters all moving, the students will be overwhelmed and won’t know where the teacher wants them to look. Even if you highlight the key element with a frame, their eyes can easily be drawn to other moving parts. Therefore, it’s best to have only one dynamic focal point. Of course, if the page background is simple, like for a matching exercise, having three or four moving elements is acceptable.

Researcher:
What if the background itself is a continuous animation, like falling rain, while you are explaining the text in the foreground? Would that distract the students?

Teacher A:

That has little impact. Because the background animation is a continuous repetition of a single action (like rain), they lose interest after a short while and won't keep staring at it. With the teacher's guidance, most students' attention will return to the main teaching point.

Researcher:
I'd like to verify a ranking of classroom attractants with you. Does this align with the actual situation?

1. Games and interaction
2. Animations and videos
3. Cute static pictures
4. Text

Teacher A:
Absolutely correct. That order is a perfect reflection of the reality. Students are visually oriented; text holds the least attraction for them and requires the teacher to enforce their focus on it.

Researcher:
Where does singing fall into this?

Teacher A:
Singing is more of an "interaction." It's usually a call-and-response where I sing a line and they repeat it. When I play a music video before teaching the song, I've noticed that the younger students' attention is entirely on the visuals of the video, not on listening to the song's content. They comment on the characters' clothes or the changing scenes. So, when using video for teaching, the teacher needs to constantly remind them to "listen to how it's being sung." The main purpose of teaching songs is to cultivate their sense of language and rhythm, making learning English more fun.

Researcher:
That aligns well with the psychological principle that young students primarily use intuitive and visual thinking.

Teacher A:
Yes, that's exactly right. The teaching content at this stage is also mostly concrete objects or actions that are visible and easy to understand. Therefore, the courseware design must provide a large number of intuitive images to establish a direct link between the "image" and the "English word," rather than going through a Chinese translation. This also aligns with second language acquisition theory, which advocates for creating a language environment during the initial stages through imitation and a great deal of "listening" and "speaking" to cultivate interest.

Researcher:
Finally, let's talk about the changes in attention during different stages of a class and how courseware design can adapt. According to some theories, the attention curve in a class looks something like this:

- **First 5 minutes (Warm-up/Lead-in):** Attracting attention.
- **5-15 minutes (New Content Presentation):** Attention reaches its peak.
- **After 20 minutes (Practice):** Attention starts to decline.
- **Just before class ends (Summary):** A brief resurgence of attention.

Do you agree with this observation?

Teacher A:
I completely agree; this perfectly matches my actual teaching experience. The attention span of first and second-graders is about 20 minutes. After that, they start to fidget and engage in various small movements.

Researcher:
So, based on this pattern, how do you think the courseware design should be adapted? For example:

- **Lead-in stage:** Use very flashy and fun animations to grab their attention.

- **Presentation stage:** Keep animations and images relatively simple to highlight the key points and avoid distracting from the core knowledge with excessive flair.
- **Practice stage:** When their attention wanes, use very engaging, game-like animations to pull their focus back.
- **Summary stage:** The design can be simple because the prospect of «class is almost over» is the biggest motivator in itself.

Teacher A:
That approach is absolutely right and is exactly how it should be designed.

- The **lead-in** needs to be fun to activate them.
- During the **presentation** of new material, the focus should be singular and clear to take advantage of their most attentive 10 minutes to ensure they learn the core content well.
- In the **latter half of the class**, they do get tired, or rather, their attention needs a new stimulus. If the practice session is just a dull matching of pictures and text, they will be very reluctant to do it. But if the practice is designed as a fun game with striking visual effects, it can recapture their attention, and they will be happy to participate.
- For the **final summary**, you really don't need fancy designs. The teacher's words, "Let's read these words well and then we can finish class," are more effective than any animation.

Interview Transcript Teacher E

Interviewer: Researcher
Interviewee: Teacher E

Researcher: We can begin.

Teacher E: Alright. Regarding the modification of the courseware graphics and colour scheme, I have a few thoughts.

Researcher: Okay, please go ahead.

Teacher E: First, this new colour scheme is very clear. It's refreshing from the moment you open it. I find the colours to be a warm palette, which is very nice. The courseware previously provided by our Teaching and Research Office had a green background, perhaps for the sake of protecting students' eyesight, but I think this warm palette of yours is also very good. It's not harsh on the eyes and is actually quite comfortable to look at because it gives a very soothing feeling. Our previous green colour felt a bit dull and dated.

Researcher: That's because this is actually the second round of testing. In the first round, the version I showed the teachers had green, red, yellow, and so on.

Teacher E: Those colours were too glaring.

Researcher: Yes, some teachers at the time reported that the children felt they needed brighter colours, but not colours that were jarring to the eyes.

Teacher E: The equipment we use now is an all-in-one interactive whiteboard. The entire board is black, with a large main display screen in the middle, which is essentially the same as our computer screens. The courseware from our Teaching and Research Office also has a dark green background on the homepage, which feels too dreary to us. Your current warm palette is much better. However, in a later chapter, the courseware for the fourth lesson, you used a ginger-yellow colour.

Researcher: Yes, that was to test the effect of different colours.

Teacher E: I think the colours in the first three chapters were great, but when it came to the fourth chapter,

that ginger-yellow—although the centre is white—the yellow on the sides felt a bit harsh on the eyes.

Researcher: So, you would lean towards a scheme where the colour saturation isn't too high, is that right?

Teacher E: Exactly. Protecting students' vision is very important nowadays. They spend a lot of time in class looking at screens, and if the colours are too vivid, their eyes will get tired easily.

Researcher: Then I'd like to ask, compared to other subjects, is the reliance on PowerPoints in English class higher?

Teacher E: Yes, especially in oral English classes. It might be less so for upper grades, but for lower grades, oral English is primarily about speaking, with very little writing. Therefore, they spend a longer time looking at the PowerPoint, and its usage frequency is higher. Also, we have many games and activities in class, and many of them are now operated through the PowerPoint, much more so than in Chinese and Math classes. Chinese and Math classes usually have about ten minutes of writing practice, but the practice in oral English is mostly verbal, so they are focused on the PowerPoint most of the time. They only look away when we're doing group drills, group discussions, or activities like puzzles and small games.

Researcher: Got it.

Teacher E: For second-graders, they don't do much writing, so a lot of their time is spent looking at the PowerPoint. Therefore, a warm, less glaring colour palette is better for highlighting the text content. If the background colour is too bright, it will distract from the lesson content.

Researcher: Understood.

Teacher E: Next is about the font size. I think it's well-designed, no issues there. And using this kind of stick font is quite fun and suitable for younger students, as it's clear to read. However, our curriculum has been revised.

Researcher: It changed again? I was told before that using a stick font was a requirement.

Teacher E: The current third-grade class, who just moved up, has been using it for a semester already. Starting from the third grade, they've gone back to using a script font.

Researcher: I'm not focused on the third grade for now.

Teacher E: No, what I mean is, although there's no writing requirement for the second grade, they might start learning to write next semester, which needs to align with the third-grade content. Third grade now uses a cursive-style font with hooks to connect with middle school. This stick font is actually very suitable for elementary students, especially the younger ones, because it's clear. But if they're still using this font in the second half of the second grade, they might have trouble adapting to the third grade.

Researcher: So, will the second grade also switch to the script font later?

Teacher E: Actually, the font in the textbook itself is not a stick font; it's a standard print font. We only change the font in our PowerPoints to make it easier for students to see, for aesthetic reasons, or for a smoother transition.

Researcher: Okay.

Teacher E: The textbook uses a print font, but the problem arises when they're required to write. Sometimes we make word cards, with a picture on top and the word to be written below. For example, the word "apple," students don't know how to write the letter "a" because the print version of "a" in the book looks different from the handwritten version. They don't understand it and don't know how to make the conversion.

Researcher: A previous teacher told me that the Teaching and Research Office required that all PowerPoints must use this stick font.

Teacher E: That was because, at that time, the third-grade curriculum also required writing in a stick font. But now the curriculum has changed; the entire curriculum, including the writing content, has been revised. They revise one grade level each year. This semester, they revised the third grade; next school year, it will be the fourth grade. I'm referring to the handwriting font requirements in the curriculum.

Researcher: Do you know why they changed the font?

Teacher E: The official reason wasn't stated clearly. But among us teachers, we discussed it and believe it's to align with middle school, which teaches script font. Also, the handwriting examples in the new textbooks are all in script font, so it's for an earlier transition.

Researcher: In your opinion, for second grade, should the PowerPoints follow the textbook and change the font, or continue using this stick font?

Teacher E: For example, when we observe third-grade classes now, we see that the sentences and new words in their PowerPoints are already using the script font required by the textbook. This is because students need to imitate; they see it and know how to write it, especially since third grade is the beginning of learning formal handwriting. So, if you're making courseware for next semester, some content might need to be adjusted. However, our school is unique in that we start teaching handwriting in the second half of the second grade, while some smaller schools might not.

Researcher: So the main difference is whether the second grade teaches handwriting, and that decision affects which font is used in the PowerPoint.

Teacher E: Yes. However, when we teach letter writing, we might create separate PowerPoints just for handwriting practice, taking a little time each class for it, rather than integrating it into the main lesson like we do now. So it might not conflict with your courseware.

Researcher: Can I understand it this way: for the main content in the PowerPoint, it's best to use a font consistent with the textbook, like the script font, so what the children see and what they learn are the same. But for sessions specifically teaching handwriting, would a stick font be better than a script font?

Teacher E: If we are teaching handwriting, we must follow the requirements of the new curriculum. As for this oral English PowerPoint, it's separate from the handwriting instruction I just mentioned. That is an additional component and isn't directly related to your lesson content.

Researcher: So, the handwriting instruction is something added by certain schools or teachers, and according to the official curriculum, the second grade still focuses on listening and speaking?

Teacher E: For example, our Panyu District's Teaching and Research Office requires us to start integrating handwriting in the second grade, but other districts may not. It's our district's requirement for an early transition. So, regarding your font, I think using the stick font should be fine.

Researcher: The reason I'm asking is that my final goal is to write a design guide for this type of courseware, so font usage is something I need to understand clearly.

Teacher E: At that time, the requirement was to use the stick font because the curriculum at the time demanded it. Now, the curriculum itself has changed.

Researcher: And why do the teachers think it changed back to a script font?

Teacher E: We don't really understand either. We all guess it's to align with the textbooks, and also because the new curriculum content has become very life-oriented. It used to be thought that the stick font was suitable for young children, but now it seems we're reverting to the old model, even changing the font.

Teacher E: Another point about colour is the font colour. I think in the first three lessons, using red to highlight key words while keeping other content in black is a good approach. It helps students easily distinguish the key points of the lesson.

Researcher: In some PowerPoints, the key words are not in red. Is there a reason for that?

Teacher E: I noticed on some pages with sentences, it would be better if different colours were used for distinction, and if some key words had their colour changed.

Researcher: What colour do you think is best for key words? A previous teacher mentioned that red is sometimes associated with "errors," so I sometimes use blue or green.

Teacher E: In our classrooms, blue and green fonts are not clear when projected. It should either be black, or a combination of black and red. Blue or purple can only be used as a background colour; the font should never be in those colours. When we attend training or workshops, the courseware we see rarely uses other font colours.

Researcher: So, the basic principle is a light-coloured background with black text, and red for highlighting.

Teacher E: Correct. For example, in the first lesson when teaching the present progressive tense (-ing), just changing “ing” to red makes the effect very clear. Students can see where the change is at a glance.

Teacher E: I also want to mention an issue in the first lesson. Starting from page 10, pictures are used to guide a student discussion. However, from page 11 to page 16, the audio for these pages seems to be incorrect; the content and the audio do not match.

Researcher: Oh, the files might have gotten mixed up. Since I was modifying a copy of the original courseware, some parts might have become disordered.

Teacher E: I thought that might be the case. Another thing I think you did very well in this PowerPoint, compared to the old version, is your use of frames. You framed the words and content, which makes it very clear for the students to see, unlike the old version where the distinction wasn’t as obvious.

Researcher: The previous version was often just a large white box with an outline.

Teacher E: Your current use of a frame-based design makes the teaching content stand out and much clearer. Later on, you also replaced the old-fashioned watch phone with a modern smartphone, which is also great, as it’s more relevant to their lives.

Researcher: I remember the original picture’s resolution was too low.

Teacher E: Changing it to a smartphone works well, because kids these days do use smartphones more. You mentioned 2D and 3D animation; I noticed many of the graphics still use the animation style from before.

Researcher: Yes, if it’s a picture from the textbook, I generally don’t change it, so that students can connect the courseware with their books.

Teacher E: Actually, today’s kids see so many animations and videos; they’re no longer satisfied with simple animations. I really want to emphasize this point: today’s students are truly very different from the ones we used to teach. In the past, a very simple PowerPoint could get the whole class excited, but now if you just present the content plainly, they feel bored. They are used to seeing dynamic things.

Researcher: Yes.

Teacher E: So, they are only drawn in when they see dynamic videos or animations. But that creates another problem: if there are too many dynamic elements, many of them will start discussing what the characters in the animation are doing and ignore the actual learning content. That’s why today’s students are so difficult to teach.

Researcher: I’ve been thinking about this problem as well. Dynamic elements are necessary to attract them, but if the animation is too strong, they get distracted and ignore what the teacher is saying.

Teacher E: Yes, younger students are already hard to manage. If there are a few mischievous ones, they will constantly discuss what the animated characters are doing, and then just laugh and play. This is a very serious problem now.

Researcher: And as you said, they’ve “evolved” so quickly now. If you don’t show them these things, they find it boring and ignore you.

Teacher E: Exactly, that’s how it is now, unless the class has a very high level of concentration. In my current classes, only one or two have good concentration; the rest don’t. A static picture gets no reaction from them, but as soon as there’s more action, they constantly discuss the actions. So, the attention span of children now is very poor, and they’re exposed to too many animations and videos. This has led to a major challenge in creating PowerPoints: how to capture and maintain their attention.

Researcher: Understood.

Teacher E: So when creating animations, technique is crucial. How can you make it so that while they are watching the animation, they are also paying attention to the main content?

Researcher: I had a proposed solution I’d like your opinion on. I know that children have a limited attention span. For instance, in a 40-minute class, the prime time might be the first 15 minutes. So, when I arrange the PowerPoint, I put the key content in the first half or middle section. During this period, there can be fewer animations because their concentration is relatively high.

Teacher E: Hmm.

Researcher: Then, at the very beginning of the class, I add some animation or sound to help them immediately focus their attention. Later on, in the middle and latter parts of the class, when they start to get tired and their concentration wanes, I add more dynamic elements to revive their interest. That's usually when it's time for practice or games. What do you think of this arrangement?

Teacher E: That could work. It doesn't need to be animated from start to finish. You mentioned using subtle animations when the topic is introduced; I think that's fine. It won't distract them. What causes a distraction are the character animations, like swimming or jumping rope. They pay a lot of attention to those.

Researcher: Okay.

Teacher E: You just mentioned sound, and I happened to have made a note about that. When introducing some key phrases or sentences, if you can accompany them with sound, the effect might be better. The sound system in our classroom is very good, it's surround sound and very clear. I've found that when a word appears, the students' reactions are completely different depending on whether there's sound or not. When there is sound, they listen more intently.

Researcher: I see.

Teacher E: Especially if it's a child's voice, they listen with more focus. But if it's a teacher's voice or a more mature adult's voice, they're not as interested.

Researcher: Does sound, like animation, cause them to start discussions? For instance, sound effects.

Teacher E: I'm not talking about page-turning sound effects, but the sound of the main vocabulary being read aloud. For example, if the word "eyes" appears on the slide, if it's just the teacher leading the reading, they might not be interested. But if the word pops up with its own audio, the combination of the word and the sound is much more effective. This kind of normal pronunciation won't cause them to discuss it; on the contrary, it will make them listen more carefully.

Researcher: And they are more drawn to children's voices than adult voices, is that right?

Teacher E: Yes. It's the same in my classes. Sometimes I find that some of the outstanding students in the class have excellent pronunciation and intonation, so I'll ask them to lead the reading, and the result is very good. It's easier for me, and they enjoy listening and following along.

Researcher: It's the feeling of learning from a peer.

Teacher E: Exactly, it's that peer feeling. They really do prefer listening to the voices of their peers.

Researcher: Separately, what are your thoughts on using real photos?

Teacher E: We rarely use real photos in our courseware due to copyright and portrait rights issues. However, in the courseware from the Teaching and Research Office, occasionally there are videos in some chapter activities featuring real children, but they are always credited.

Researcher: The "real photos" here mainly refer to photos of real objects or scenes. For example, when talking about shopping, we might use photos of actual malls. The question is, when expressing a concept, is it better to use cartoons or real object photos?

Teacher E: That depends on the context. You can't just suddenly insert a real photo. It has to be based on the lesson design and where it's needed. It's not that they can't be used at all, nor that they should be used exclusively.

Researcher: For example, during a discussion segment, you could insert some real-life scenes.

Teacher E: Right, especially in discussion segments or when you're creating a scenario. But for teaching new content, like I remember a lesson on "tall" and "short" that featured Yao Ming, that's acceptable. Occasional use is fine, but not for everything.

Researcher: So, if the entire PowerPoint is in a cartoon style, it's best not to suddenly insert a large section of all real photos, correct?

Teacher E: Yes. It has to follow your lesson design. You should only consider using cartoons versus real scenes when you need to create a specific scenario. Your current PowerPoint's scenarios are mostly consistent with the textbook, without creating new ones, so suddenly adding real photos would not be appropriate.

Researcher: So, it all comes back to the lesson plan first.

Teacher E: Correct, our PowerPoints are all based on the lesson design. Especially for a demonstration lesson, you must have the lesson design first, and then create the PowerPoint. You have to discuss whether real scenes or characters are needed.

Researcher: I've seen some lesson plans for demonstration classes that are incredibly detailed, even including theoretical justifications.

Teacher E: Yes, they are very long. To prepare for one demonstration class, creating the PowerPoint takes a very long time, and it's usually a team effort.

Researcher: But the content of those demonstration classes doesn't seem very practical for everyday teaching, does it?

Teacher E: That's right, it's different from what we actually use and is difficult to apply. Demonstration classes are mainly for workshops and seminars. After the class, everyone discusses and evaluates it. Furthermore, much of the content from a demonstration class is hard to implement in one's own classroom because there's too much preparation involved, and you have to consider your own students' level.

Researcher: How frequently is the material from the textbook used?

Teacher E: The learning content from the textbook mainly appears at the beginning of the PowerPoint (for introducing the topic) and at the end (for a summary). It occasionally appears in the middle, but not too much.

Researcher: The next two lessons are "Story Time," so I mostly just used the pictures from the book.

Teacher E: I noticed that in your third lesson, you seem to have included some story content from the fifth and sixth lessons.

Researcher: I generally didn't change the teaching content; I based it on the old version of the courseware.

Teacher E: The courseware provided by the Teaching and Research Office isn't perfect itself. It was created for televised lessons during the pandemic, which lacked student-teacher interaction, so the content moves very quickly. If we use it in the classroom, we need to add drills and interactions, which makes the content feel too packed and overwhelming. We often can't finish it, and some parts are too repetitive.

Researcher: A previous teacher also told me they couldn't finish it. How do you usually modify it? Do you just delete parts?

Teacher E: When I have more time, I'll revise it carefully, deleting some parts and rearranging the order. But often, I modify it as I teach, simply skipping over the more tedious parts. Especially for the second-grade courseware, there's a lot of repetition and follow-the-leader reading, so I'll change that into group reading activities.

Researcher: I see.

Teacher E: A perfect PowerPoint needs a lot of polishing. Just because you've made it doesn't mean it will match the students' classroom dynamic; you have to modify it through trial lessons.

Researcher: Some teachers have complained that the old courseware is too difficult to modify; one click and everything gets messed up.

Teacher E: Yes, that can happen. That's why sometimes I just make verbal adjustments in class, skipping certain segments.

Researcher: We are thinking about how to make it easier for teachers to use and modify.

Teacher E: How to modify it really depends on the teacher's own teaching style and the class situation.

Also, students love having games in the PowerPoint.

Researcher: Yes.

Teacher E: You could add more game-like segments. For example, card-flipping games. Students love to go up and interact with the screen themselves, tapping it to flip a card and read what's on it. These kinds of highly interactive segments are especially popular.

Researcher: Yes, games like the "Train" game are also very popular.

Teacher E: The "Train" game is mainly for reading aloud. I'm talking about the kind they can physically interact with. In the consolidation stage, you can add some games that promote active participation and hands-on practice, letting them go to the screen to tap or operate it. Their enthusiasm will be much higher.

Researcher: For these impromptu games, does the PowerPoint need to be adapted?

Teacher E: If the game is pre-planned, you definitely need pages for the rules and a demonstration. But for simple, impromptu games to energize the class, like passing an object, you don't necessarily need it. However, if it's a new game and the students don't know the rules, you need to use a video or prompts to show them how to play.

Researcher: Understood.

Teacher E: Overall, the main purpose of the games we design is to reinforce the knowledge learned in class.

Researcher: Compared to using the old courseware, what differences have you noticed in the students' reactions to this newly revised version?

Teacher E: The most obvious reaction was to the background colour. They noticed the change immediately and found it bright and eye-catching. The animations were also very engaging. The frames you designed make the content more intuitive, making it easier for them to absorb.

Researcher: Yes, as designers, we approach visual output more systematically, following human cognitive logic.

Teacher E: Right, your visual design is very well done.

Teacher E: Also, students really like PowerPoints that include games that are active and practical. This kind of dynamic element doesn't distract them; instead, it effectively enhances the classroom atmosphere. The courseware from the Teaching and Research Office, being designed for television lessons, is mostly instructional and lacks this interactivity.

Researcher: Does this kind of interactivity risk causing chaos in the classroom? For instance, if students get too excited.

Teacher E: No. You're not letting them run around freely for the whole class. The activity is just a small part integrated into the teaching process; it doesn't last the entire lesson. This really tests the classroom management skills of us oral English teachers—you have to be able to let them get excited but also be able to bring them back to focus.

Researcher: I understand.

Teacher E: That's about it. What I've shared is based on my everyday teaching experiences.

Researcher: This is exactly what I need.

Teacher E: After all, I'm not one of those famous master teachers or a dedicated researcher. They would speak with more depth. What I have is practical, frontline teaching experience.

Researcher: But research findings don't always translate quickly to the classroom, whereas your experience is what's actually happening in real time.

Teacher E: Yes, a lot of the time, the results of our research projects are difficult to apply in the classroom because we have to consider the students' actual situations, and every class is different. Ultimately, the PowerPoint is just a tool. The students' engagement, their concentration, and the influence of the modern

era are the more crucial factors.

Researcher: I understand. Thank you very much.

Phase 2 (FEEDBACK INTERVIEWS 2): detailed description of specific design guidelines

Topic 1: (5) Support interactive activities, enhance voluntary attention

Integration of motion graphics and games

- Motion graphics as a direct entry point to games, such as spinning wheel games, with real-time visual feedback supporting human-computer interaction.
- Motion graphics for explaining game rules and supporting interactions Well-known games may require only brief visual cues, while unfamiliar games benefit from clearer operational demonstrations to ensure participation.

Effective interactive design

Interactive elements should go beyond mere entertainment value; they should encourage students' active engagement and hands-on participation. As long as the interaction is closely aligned with learning objectives, experienced teachers can manage the pacing to prevent distraction.

Challenges in motion effects

- Students are easily drawn to irrelevant visual elements, which can occasionally lead to off-topic discussions.
- While motion graphics are effective in capturing initial attention, excessive or repetitive motion effects may divert focus, requiring teacher guidance to redirect students back to the key content.
- Students are less interested in static content and rely more on motion elements to maintain classroom engagement. Once again, this illustrates the prevalence of motion graphics in the classroom and the need for research into how their design can effectively support teaching and learning.

Usage of video clips

- Practical experience suggests that placing video clips in the middle of a lesson can help sustain students' attention. Nevertheless, the timing of video integration should align with pedagogical needs and teachers' instructional routines.

- Visual content naturally attracts students' attention more than audio.

Topic 3: Graphics and photos in visual expression

The supplementary insights from the FEEDBACK INTERVIEWS 2 are as follows:

- Currently, most teaching material is mainly using graphics as visual expression, so the sudden replacing a lot of graphics with photos is not recommended, it may affect the coherence of students' understanding.
- If more accurate information needs to be conveyed (e.g., for after-school field study), the use of photo is more appropriate.
- In the lower grades, the use of student photos or videos can enhance the intimacy of the classroom, but there is a need to be mindful of the protection of portrait rights, so photos of people are generally not commonly used.
- The use of graphics or photos should be decided flexibly according to the needs of the content, to avoid the cognitive burden caused by random switching.

Topic 8: Text

Avoid text colours that are too bright in colour and decorative, ensure that there is sufficient contrast between the text and the background to ensure readability and clarity.

Font choice and curriculum setting

- If typeface used in PowerPoint are not consistent with textbook fonts. This especially confuses second-grade students who are still learning to write, as inconsistent typeface can cause cognitive confusion during review.
- Using typeface consistent with textbooks helps build cognitive connections and keeps classroom visual content aligned with printed materials.
- Textbook versions are updated frequently, so there is no fixed preference for a specific typeface, and teachers do not clearly feel that typeface choice directly affects learning.
- Continuing to use the 'Bat Font' is acceptable:
- The typeface is visually clear, helping students recognize and understand words.
- It supports clarity in information delivery.
- Typeface familiarity directly affects students' word recognition and reaction speed; consistent fonts help quick memorisation, while new typefaces require visual adaptation and lower reading efficiency.
- It supports handwriting acquisition.

- Typeface choice depends on whether handwriting skills are being taught.
- Since curriculum settings differ across regions and schools (such as whether handwriting is taught in second grade), typeface use should adapt to specific contexts and cannot be fully standardised.

Topic 9: Colour

In Prototype 3, the overall colour schemes were generally well accepted by the teachers. Most of their feedback and suggestions were consistent with what had been mentioned in previous interviews. However, one specific point of feedback concerned the use of the yellow scheme in Prototype 3. Some teachers suggested that the colour saturation should be reduced, as both red and yellow are inherently strong and attention-grabbing colours in visual design. Therefore, they recommended avoiding high saturation levels when using these hues to prevent visual fatigue or distraction.

Topic 10: Sound

Child voices are more engaging than adult voices: Audio recorded with children's voices tends to attract students' attention more effectively, as adult voices, especially those similar to the teacher's, may feel overly familiar and monotonous. Peer-like voices offer a fresher and more appealing listening experience.

VERIFICATION INTERVIEWS

Question guides

INTERVIEW QUESTION GUIDES

For motion graphics as an educational tool that supports learning English vocabulary by Chinese students

In-depth semi-structured interviews in phase 3

Greeting

Warm up

"How are you doing today?"

Thank you so much for taking the time to speak with me today. My name is Zijun Li, and I am a PhD researcher at Lancaster University. My research focuses on creating a design guideline for motion graphics used in teaching English vocabulary to second-grade students in Guangzhou's public primary schools.

The goal of this interview is to get your professional feedback as a designer. I will briefly walk you through the key themes of the guideline I've developed. There are no right or wrong answers. I am genuinely interested in your honest opinions, personal experiences, and any insights you might have, whether they align with or challenge the guidelines' suggestions. Your perspective is incredibly valuable for ensuring this research is relevant and impactful for the design community.

Before we begin, do you have any questions about the project or the consent form you signed? Just to confirm, this interview will be audio-recorded for transcription purposes, and all your personal information will be kept confidential. You can choose to stop the interview at any time.

*The above is the general flow of the interview, the details of which will be modified slightly according to the previous steps.

INTERVIEW QUESTION GUIDES

For motion graphics as an educational tool that supports learning English vocabulary by Chinese students

Opening Question

To start, could you briefly describe your experience as a designer, especially if you've ever worked on educational materials or projects for young children?

Part 1: Scenario & Initial Design Intuition

Let's imagine you've been commissioned by a primary school in Guangzhou. The task is to design a set of PowerPoint-based motion graphics to help second-grade students learn English vocabulary in the classroom. The school has provided you with the textbook content and the lesson plan.

> ***"What would be your very first steps in approaching this design task? What kind of information or references would you look for to get started?"***

Part 2: Deep Dive into the Guideline's Core Themes

Now, I will introduce several key themes from my design guideline. After each one, I would love to hear your thoughts.

Area A: The Macro-Strategic Framework (The 'Why' and 'When')

The first area covers the overall strategy. It links design choices directly to the flow of a 40-minute lesson and student attention levels. For example, it suggests using high-impact animations to capture attention at the start, but then deliberately reducing visual complexity during the core teaching phase to avoid distraction. It also emphasizes creating meaningful, coherent narrative scenarios that are grounded in the students' local culture to make learning feel relevant and immersive.

> ***"From your professional perspective, how does this strategic framework—linking design to the pedagogical timeline and emphasizing narrative context—align with your practice? Does this feel like a helpful guide, a creative limitation, or a confirmation of what you already do?"***

*The above is the general flow of the interview, the details of which will be modified slightly according to the previous steps.

Area B: Core Content & Interaction Decisions (The 'What' and 'How')

The next area deals with key content decisions. First, it discusses the strategic choice between graphics (cartoons) and photos, framing it not as an aesthetic choice, but as a choice of 'cognitive pathway' for the student.

Second, it introduces a key principle of designing for modifiability, meaning the PowerPoint should be built so that teachers can easily edit texts or replace images, empowering them to adapt the content for their specific class.

> ***"Let's discuss these two points. First, how do you typically decide between graphics and photos for children?***
>
> ***Second, what are your thoughts on intentionally building 'modifiability' into your final products for end-users like teachers? Is this something designers often consider?"***

Area C: Cognitive & Perceptual Principles (The User Experience)

This area focuses on the student's cognitive experience. It covers three principles:

> ***•Visual Cues & Consistency: Ensuring that functional elements like buttons or prompts always look and behave the same to reduce cognitive load.***
>
> ***•Intuitiveness: Making sure all visuals are direct and unambiguous, avoiding metaphors or details that could lead to confusion or off-topic discussions.***
>
> ***•Familiarity: Strategically using familiar elements (like popular cartoon characters or previously learned formats) to increase engagement and comfort, especially when introducing difficult new content.***
>
> ***"These principles—consistency, clarity, and familiarity—are central to user experience. In your work, how much do these factors typically influence your design process when creating educational content? Are there any here that you feel are particularly critical or often overlooked?"***

*The above is the general flow of the interview, the details of which will be modified slightly according to the previous steps.

Area D: Foundational Visual & Auditory Elements (The Building Blocks)

The final area provides very specific, practical recommendations on the 'building blocks' of the design. This includes:

- ***Text: Suggestions for font sizes to ensure visibility from the back of the classroom.***

- ***Colour: Guidance on using bright, high-contrast palettes that appeal to children while considering the classroom environment (e.g., avoiding colors that clash with the blackboard).***

- ***Sound: Recommendations on using authentic sounds and child voice-overs to enhance immersion and engagement.***

"This section offers concrete, rule-like suggestions. How do you feel about such specific recommendations in a design guideline? Do you find them helpful and practical, or too prescriptive? How do they compare with your own professional judgment and experience?"

*The above is the general flow of the interview, the details of which will be modified slightly according to the previous steps.

Part 3: Overall Impression, Gaps, and Broader Insights

We've now covered some of the main ideas. I'd like to zoom out and get your overall impression.

> ***"Overall, how do you feel about this guideline? Which parts, if any, stood out to you as particularly insightful or surprising—things you may not have considered before? And which parts felt more like a confirmation of existing best practices or 'common sense'?"***
>
> ***"Based on your professional experience, what do you think is missing? If you could add a new theme or principle to this guideline, what would it be?"***
>
> ***"Finally, do you have any 'disruptive' ideas? Are there any principles in this guideline that you fundamentally disagree with, or do you have a completely different vision for what would make an effective learning tool for these students?"***

Part 4: Wrap-up

"This has been incredibly helpful. The insights you've shared are invaluable to my research. Thank you again for your time and expertise."

"Do you have any final questions for me?"

Ending

> *"Thank you very much for participating in this interveiw. The information you have provided has been very helpful.*
>
> *Are there any questions that I can answer before we end the session?*
>
> *Thank you again for your help. I really appreciate your time and your knowledge."*

*The above is the general flow of the interview, the details of which will be modified slightly according to the previous steps.

Final themes, subthemes and codes (VERIFICATION INTERVIEWS)

Final Theme 1: The Value and Inspirational Nature of the Guidelines: Between "Common Sense" and Professional Insight
* Usefulness, inspiration, novelty
* Exceeding expectations vs. being perceived as common sense
* Providing new perspectives and addressing designers' blind spots

Final Theme 2: The Necessity of Clarity in Expression and Structural Optimization
* Abstract expression
* Information overload
* Redundancy and unclear hierarchy
* Need for streamlining, visualization, and restructuring

Final Theme 3: A Concentrated Demand for High Practicality and Operability
* Concrete guidance
* Application instructions
* Cases, methods, and procedural steps
* Avoidance of abstract principles

Final Theme 4: Design Principles Oriented Toward Children's Cognition and Instructional Goals
* Children's attention characteristics
* Contextualized and life-related design
* Visual hierarchy
* Controlled use of multisensory elements

Final Theme 5: Empowering Teachers: From Delivering Finished Products to Providing Modifiable Tools
* Teachers' need to modify materials
* Technical skill limitations
* Design flexibility
* Provision of modification guidance

Interview transcript

Interview Transcript Designer 1

Interviewer: Researcher
Interviewee: Designer 1

[01:21] Researcher: The purpose of this interview is to understand, from a designer's perspective, how you would approach a design request like this—for instance, if a primary school teacher asks you to create a dynamic graphics PowerPoint for their class. Assume the teacher will provide all the information except for the design itself, such as the teaching content, textbook materials, and course flow, while the design aspect is entirely up to you. In this situation, what would your design process be?

[02:15] Designer 1: I think the first step would be text analysis. It's essential to first clarify the theme, the specific grade level of the students, and the subject matter. I believe defining the specific age and characteristics of the student group is very important. Secondly, I would need to analyse the course requirements provided by the teacher and the specific content to be presented, conducting an in-depth analysis of this textual information.

[02:51] Researcher: Okay, so after you've understood all that content and moved into the design phase, what would you do next?

[03:05] Designer 1: The first step would definitely be to look for some relevant, existing case studies. I'd want to see what current primary school textbooks look like and what kind of dynamic videos they usually pay attention to, to understand the visual styles they prefer.

[03:32] Designer 1: The core challenge is getting the primary school students to accept and enjoy this form of expression. This requires us to cater to the characteristics and cognitive habits of their age group. We need to understand what they like to see, for example, what kind of visual materials they are exposed to, and how textual information is transformed into graphics. Since the target audience is young students, not adults, the design must align with their aesthetic and cognitive habits, making it easier for them to learn in a familiar environment.

[04:36] Designer 1: I think many existing materials can be used as references, such as popular science books for young students. These books often use very engaging methods to tell stories and explain concepts, whether through static illustrated materials or pop-up books with interactive elements. These static narrative processes can actually be seen as individual storyboard frames for a dynamic story, from which we can learn how to piece a story together.

[06:06] Researcher: Okay. The purpose of our research is to provide a clearer set of design guidelines for designers. It may not be extremely specific, but it will include some theoretical parts that can inspire thinking. I will now walk you through the 10 topics of this guide, and I hope you can provide some feedback, such as whether it's useful or if it's just "design common sense."

[07:03] Researcher: The scenario is as follows: You need to create a dynamic graphics teaching material for a second-grade primary school English vocabulary class, primarily using PowerPoint for production and presentation.

[07:53] Researcher: The first topic is about "The Course Flow of Dynamic Graphics and Attention Guidance." Based on our research, a class can be divided into several stages. In the initial 0-5 minutes, we suggest designers use dynamic graphics to attract students' "involuntary attention," which can be achieved through novel animations, videos, or strong visual stimuli.

[09:34] Researcher: Next, the students' attention will gradually shift to "voluntary attention," meaning they are truly starting to listen. At this stage, we recommend reducing excessive flashy visual elements to avoid distraction. When the teacher explains new content, the students' attention will peak, so the intensity of dynamic effects can actually be reduced, as this is a natural cognitive process.

[11:04] Researcher: In the latter half of the class, students' attention may start to fluctuate. This is when dynamic graphics need to play a role again, using a mix of "involuntary" and "voluntary" attention techniques (like interest-based guidance, cartoon characters, life scenarios) to recapture their focus. As the class nears its end, the dynamic effects can transition smoothly, as the teaching segment is concluding. What are your thoughts on this first topic?

[12:12] Designer 1: I see that the core of this topic is focused on changes in student attention. However, I personally feel that the overall presentation, especially in the design strategy section, might be a bit confusing for a designer. Points like "avoiding distraction" and "novelty" are somewhat abstract, and there are too many points to remember, which might be difficult for a designer to apply in practice.

[13:12] Designer 1: Perhaps the attention-change timeline could be made clearer, even visualized. For example, using a chart to show which design elements (like novelty versus classicism) should be dominant at different stages. The current text-based description is very abstract; making it more visual might be more helpful.

[14:43] Researcher: So, on a content level, do you find this guide inspiring? In other words, does it point out things you might not have considered before but find useful?

[15:24] Designer 1: I think some points are helpful. For example, the suggestion to "reduce flashy expressions when explaining new content" is backed by sound reasoning. It's true that as a class is about to end, students don't have much patience for complex visuals.

[16:10] Designer 1: I believe the strategy section needs to be more concise; some of the phrasing feels a bit similar and repetitive. Perhaps distilling it down to one or two core points per stage would be better. Designers usually prefer to remember a key sentence or two rather than long paragraphs.

[18:25] Designer 1: In terms of content, the balance you mentioned between "novelty" and "classicism" is quite inspiring to me, as it's similar to my master's research. The idea of how these two elements can play different roles at different stages of a dynamic process is a great insight.

[19:42] Researcher: Do you think it needs a more concrete case study to support it? For example, one that runs through the entire guide.

[19:44] Designer 1: Yes, if there could be a concrete case study, for instance, using the story of “Little Red Riding Hood” as a theme, and then demonstrating how to apply these design principles to create a PowerPoint for different teaching stages, it would be very intuitive and prevent the content from feeling fragmented.

[22:46] Researcher: The second topic is “Contextualized Teaching.” This is heavily emphasized in English education, so our guide also focuses on it. The principles include: constructing a meaningful narrative scene, ensuring the coherence of the context, and making sure all design elements serve the theme.

[24:08] Researcher: In terms of design considerations, we propose creating a “sense of reality” and a “sense of immersion,” as this needs to connect with the students’ real-life experiences. For design strategies, we suggest extracting scenes from real life and ensuring the scene’s overall integrity, completeness, and narrative quality. Also, while a cartoon style is recommended, the content should not be detached from reality but should be based on the students’ surrounding environment and culture. What do you think of this topic?

[25:20] Designer 1: I think this topic is much clearer than the previous one. Its principles can be explained in a single sentence, making it very easy to understand.

[26:12] Researcher: So do you feel the content here falls under “design common sense,” or does it offer new insights? For example, points like “ensuring contextual coherence” and “constructing a meaningful narrative scene.”

[26:26] Designer 1: I think those two points could be considered common sense. Just as when we create a presentation for a Chinese literature class about ancient poetry, we would also find relevant images to build the right atmosphere. Even non-designers might think of this when creating courseware.

[27:32] Researcher: So for you, what content in this topic would be more useful?

[27:53] Designer 1: I think it would be the more specific operational methods. For instance, “creating an immersive feeling”—the concept is easy to say, but how do you actually design for immersion? If this part could be broken down further to provide actionable guidance, it would be more valuable.

[31:29] Researcher: The third topic is about “The Use of Images and Graphics.” As you can see, in actual courseware, teachers use both real photos (images) and illustrations (graphics). As a designer, do you struggle with when to use images versus graphics in your work?

[32:33] Designer 1: Sometimes I do struggle with that. From an aesthetic and coordination perspective, I would choose whichever one integrates more easily with the overall style. But from a child’s perspective, if they recognize real-world objects more easily, then it might be necessary to use cutout images from real photos. This is definitely a point worth discussing.

[33:12] Researcher: In this topic, our recommendation is: first, to understand the different impacts that images and graphics have on a child’s knowledge absorption. For example, images are more suitable for showing reality, rich details, or connecting to post-class activities. Graphics, on the other hand, are a more convenient choice for expressing abstract concepts like actions, ideas, or processes.

[34:19] Researcher: Second, we suggest a “graphics-first, images-as-support” approach. Research shows that cartoonish graphics are generally more appealing to children. Additionally, the integration of either graphics or images with text is crucial. It’s important to ensure that visual information doesn’t overshadow the text and to avoid ambiguity. What do you think of this topic?

[37:08] Designer 1: I think this part is useful, especially in distinguishing when to use images versus graphics—that was a novel insight for me. The points that follow, about avoiding visual complexity and maintaining style consistency, feel more like common sense that a designer would intuitively follow.

[39:53] Researcher: The fourth topic is “Modification Guides and Space for Co-creation.” We found that teachers need to modify courseware but many don’t know how. Therefore, we propose that when designers deliver their work, they should leave room for modification.

[46:53] Researcher: This means we shouldn’t just provide a fixed “complete script,” but rather a “flexible script” that allows teachers to use their professional knowledge for co-creation. We also recommend placing the modification guide directly in the notes section of the PowerPoint for easy access. What are

your thoughts on this topic?

[47:53] Designer 1: I think putting the modification guide in the PowerPoint notes is feasible. For teachers who aren't familiar with the software, it's like a quick-start tutorial. This approach addresses their pain point of wanting to make changes but not knowing how.

[51:52] Researcher: So, is the concept of "reserving space for co-creation" common sense to you, or is it insightful?

[52:23] Designer 1: That point is a bit surprisingly insightful for me. Although I have provided instructions when creating PowerPoints for others before, the concepts of a "flexible script" and "co-creation" make me think about this issue on a deeper level. It's a reminder that my design shouldn't be a closed-off product, but an open tool that educators can build upon.

[52:43] Researcher: The fifth topic is "Visual Cues and Consistency." We suggest using different character designs as visual cues, for example, a teacher character appearing to signify key teaching points, and a student character for interactive or practice segments. These characters need distinct features to be easily distinguishable.

[53:53] Researcher: Another key point is "consistency." We strongly recommend that visual elements in the courseware (like characters and illustrations) should be consistent with the textbook; you can even extract materials directly from the textbook. This prevents a disconnect for students when they review the book after class. Additionally, functional visual symbols like buttons and dialogue boxes should maintain a uniform style throughout the courseware to reduce students' cognitive load.

[55:41] Designer 1: I find the idea of transplanting materials directly from the textbook very novel. This actually utilizes the "familiarity principle" to lower the students' cognitive load and matching difficulty. Sometimes, in pursuit of novelty and creativity, a designer might overlook what's most accessible to the students. This is a great reminder to "return to simplicity."

[57:40] Designer 1: The other parts, like the design of guiding icons, seem related to the earlier topic of attention guidance—they all aim to reduce the cost for students to understand new information.

[58:17] Researcher: The sixth topic is "Directness." This is very straightforward: it's a reminder to designers that second-graders' thinking is concrete and direct, so we should avoid using metaphors, puzzles, or inferential expressions. The content and visuals should be highly aligned and clear.

[58:48] Designer 1: Yes, this topic aligns with my earlier points about simplicity and clarity, but it does feel like there's some overlap with previous sections. Perhaps some consolidation could be considered.

[59:36] Designer 1: Yes, I feel that a current issue with the guide is that the different topics or levels feel a bit unbalanced. Some points, like "familiarity," might be a small strategy in an earlier section but are then expanded into a major topic later on. The overall logical hierarchy could be refined.

[01:00:20] Researcher: Okay, I understand. The next few topics are more specific. The seventh is on the "Influence of Familiarity," which is related to directness. We would explain to designers how students react differently to familiar and unfamiliar content, and based on that, suggest how they should arrange their designs. Do you find this kind of reminder useful?

[01:01:25] Designer 1: I think it could be. It's like an extension, explaining the "why" behind a design choice. For instance, once a designer understands how students react to different levels of familiarity, they can make more informed decisions about how to present design elements.

[01:01:57] Researcher: The subsequent topics cover text, colour, sound, and some supplementary points like trigger controls and transition effects. Looking at the guide as a whole, do you find it inspiring? Or does it mostly state what you would consider "design common sense"?

[01:04:28] Designer 1: I do find it inspiring. The earlier sections that are based on principles like changes in student attention and cognitive theories are more appealing to me. They explain the "why" behind the design choices, and some of these ideas were different from my previous understanding, which I find very useful.

[01:05:00] Designer 1: In contrast, the later, more specific operational suggestions, like how to choose fonts and colours, are closer to what we might consider familiar common sense. However, if these specific suggestions can be linked back to the theoretical principles from the beginning—for example, explaining why a certain colour or font is more suitable for a particular teaching stage based on cognitive laws—then

their value would be greatly enhanced.

[01:07:33] Researcher: I see. So for you, the guide's value lies more in providing the "theoretical basis" that explains the reasoning behind design choices, rather than just giving operational-level advice.

[01:07:59] Designer 1: Yes, I think you could say that. The needs of designers from different backgrounds are diverse. Some may need direct, practical methods, while others, like me, might be more interested in understanding the underlying principles. A good guide should be able to balance both aspects to be applicable to a wider audience.

Interview Transcript Designer 2

Interviewer: Researcher
Interviewee: Designer 2

[00:03] Researcher: Okay, I'll start by explaining. I'm conducting a study on the application of dynamic graphics in primary school English teaching. The goal is to create a set of guidelines for designers on how to produce these kinds of instructional PowerPoints.

[00:50] Researcher: The scenario for this interview is this: You are a designer who has been given a task to create a PowerPoint presentation for a second-grade class. The teacher provides all the teaching content, and you are responsible for the visual design and presentation. I want to understand how you would think about and approach such a request.

[01:21] Researcher: In other words, the point of this design guide is that when designers receive this kind of task, it can provide some design principles and things to watch out for, rather than leaving them to figure it out on their own or rely on just a few scattered examples.

[02:30] Researcher: Our research subjects are second-grade students in Guangzhou City, and the PowerPoint they use is based on a universal template. Now, I will introduce the ten topics of this design guide to you one by one, and I hope you can provide feedback from a designer's perspective.

[04:22] Researcher: The first topic is about "The Course Flow of Dynamic Graphics and Attention Guidance." According to our research, a class's flow can be linked to the students' attention curve. For example, in the first 0-5 minutes of class, you can use novel visual elements like animations or videos to capture the students' "involuntary attention."

[08:06] Researcher: As the lesson progresses, the students' attention shifts to "voluntary attention." At this point, when the teacher is explaining new key points, the students' attention will peak, and at this time, the dynamic effects should actually be toned down to avoid distraction. Later in the class, when their attention starts to fluctuate, you can use interesting dynamic effects again to bring their focus back. The core idea of this topic is that the design should serve the teaching rhythm and the students' cognitive patterns, rather than just chasing flashy effects. What are your thoughts on this first topic?

[09:56] Designer 2: I understand. You're saying that dynamic effects should be used strategically according to the different stages of the lesson, rather than using flashy animations throughout the entire time.

[10:04] Researcher: That's right. So, do you find this concept insightful, or does it fall under what you'd consider common sense for a designer?

[10:29] Designer 2: I think this is quite insightful. Usually, when I'm designing, I might be thinking more from a visual aesthetics perspective—how to make the screen look better, more interesting. But your approach analyses this from an educational and psychological viewpoint, telling me "why" it should be done this way. For example, reducing animation at a certain stage is to let students focus more on the content itself. This kind of theory-based guidance, I feel, is very valuable because it provides a rationale for the design.

[11:36] Designer 2: It's just that the current text-only presentation might seem a bit dry and abstract. It might be more intuitive if you could add some visualizations, like an attention curve, and then mark the corresponding design strategies and examples at different points. That would be easier for designers to understand and remember.

[12:22] Researcher: Okay, that's a useful suggestion. The second topic is about "Contextualized Teaching." Because language learning emphasizes application in context, we recommend that designers should

construct meaningful and coherent narrative scenes. All design elements should serve this scene's theme.

[24:23] Researcher: When designing, you need to consider creating a "sense of reality" and "immersion," drawing more from the students' familiar real-life experiences. While a cartoon style is recommended, the content should not be detached from reality and should be connected to the local culture and environment. What do you think of that?

[25:15] Designer 2: I think this topic also makes a lot of sense.

[26:01] Researcher: In this section, were there any points that you hadn't really considered before but found enlightening?

[26:15] Designer 2: I think the point about "the scene should be integrated with local culture and environment" is quite insightful. Because as designers, we might unconsciously use elements that are very "international" or "Westernized." For example, if we're talking about a home, we might draw a house with a fireplace and a chimney. But for children in Guangzhou, this might not be a familiar environment. If we could use elements from their surroundings, like the local *Qilou* architecture or Kapok flowers to build the scene, the sense of immersion would definitely be stronger. This point reminded me that design needs to be more locally relevant.

[28:20] Researcher: Okay. The third topic is "The Use of Images and Graphics." In courseware, both real photos (images) and illustrations (graphics) are used. Our recommendation is to use images when you need to show realistic details and enhance the sense of reality, and use graphics to express abstract concepts. Furthermore, we recommend a "graphics-first, images-as-support" approach, as cartoon-like graphics tend to be more appealing to children. What are your thoughts on this?

[31:50] Designer 2: I agree with that too. My understanding is, for example, if you're teaching the word "apple," using a real photo of an apple (image) helps them build a cognitive link to the real object. But if you're telling a story about an apple, using a cartoon apple character (graphic) would be more fun and could spark their imagination.

[32:16] Researcher: Exactly. And what about the "graphics-first, images-as-support" proposal?

[32:26] Designer 2: I think that's reasonable. Because the entire courseware is a teaching product, stylistic consistency is very important. If you use a lot of real photos with different styles, the visuals will look messy. Graphics, on the other hand, offer better control over style and help maintain overall harmony. So, using graphics as the primary visual and supplementing with photos when necessary is a very good strategy.

[35:09] Researcher: Okay. The fourth topic is about "Modification Guides and Co-creation." We've found that teachers often need to modify courseware but don't know where to start. So we suggest that when designers deliver their work, they should leave room for modifications and provide a simple modification guide, for instance, by writing it directly in the PowerPoint's notes section.

[38:15] Designer 2: I think that's excellent and very practical. It's essentially about communicating the designer's workflow and thought process to the teacher in a simple way. As you said, don't provide a "dead script," but a "living script." This not only makes things convenient for the teacher but also reflects the designer's professionalism. And putting the guide right in the PowerPoint is indeed much more convenient than a separate manual.

[38:43] Researcher: So, is the concept of "leaving room for modification" common sense to you?

[38:45] Designer 2: To a certain extent, yes. But this guide systematizes and theorizes it. It makes me think that I should "consciously" reserve this space for the user, rather than just doing it based on intuition. It reminds me that my design ultimately serves teaching, and it should be easy for the user to adjust it based on the actual situation.

[39:09] Researcher: The fifth topic is "Visual Cues and Consistency." For example, using different character designs to represent different teaching segments, and ensuring the visual elements in the courseware are consistent with the textbook, even directly porting materials from it.

[58:31] Designer 2: The point about porting materials from the textbook is very insightful. I might not have consciously realized its importance before. It's true that if the visual language of the courseware and the textbook are completely disconnected, students will be confused when they review at home. This isn't just an aesthetic issue; it's about the continuity and efficiency of learning. This reminds me that a designer can't just work in isolation; we have to always remember that the design is operating within a larger educational

system.

[01:03:00] Researcher: The remaining topics include directness, the influence of familiarity, and more specific execution-level advice on colour, sound, and trigger controls. Looking at it all together, what are your overall feelings?

[01:03:25] Designer 2: Overall, I feel this guide is very valuable. Its biggest strength is that it takes many of the things we designers do based on experience or intuition and systematizes them within a theoretical framework of education and cognitive psychology. It doesn't just tell us "how" to do things, but more importantly, it explains "why" we should do them this way.

[01:04:30] Designer 2: For example, the earlier parts about attention and the later parts about familiarity and directness could all be integrated into a more comprehensive framework. If these theoretical points could be more closely linked with specific design elements (like colour, font, and animation) and presented in a more visual way (like the charts and case studies you mentioned), then it would become an incredibly powerful and practical tool.

[01:05:10] Designer 2: It can help designers move beyond the mindset of purely pursuing visual appeal and truly think from the learner›s perspective, making design better serve the ultimate goal of education. For me, that›s its greatest insight.

Interview Transcript Designer 3

Interviewer: Researcher
Interviewee: Designer 3

[03:14] Researcher: Imagine a primary school in Guangzhou says, "Zhong Qiaozhen, please help us create a PowerPoint for second-graders to learn English." How would you do it? What's the first thing that comes to your mind?

[03:37] Designer 3: First... I would definitely need to look at their textbook content first and extract elements from it.

[03:58] Designer 3: The lesson must involve both the textbook and supplementary materials working in sync. Because you need to have the book and also the PowerPoint, so the two have to align with each other.

[04:11] Researcher: Okay. My research is about providing a set of design guidelines to tell you what to consider as a designer. For example, the first topic is about motion graphics design and its relationship with the lesson flow and student attention. We would suggest how to use motion graphics at different stages of the lesson to capture or maintain students' attention. For instance, at the beginning of the class, you can use high-contrast visuals to capture "involuntary attention"; whereas during the main lecture part, you should avoid overly flashy effects to prevent distraction. For the most important part—teaching new material—how would you design it? Would you feel that this part is very important, so your design needs to be very beautiful, cute, or exquisite?

[07:42] Designer 3: No.

[07:43] Researcher: No? What would you think of?

[07:46] Designer 3: I think for the most important part, it should be simple and to the point. It shouldn't be overly flashy. There should be a page that's like an outline, which clearly shows what we're going to learn in this class, what we should be able to master by the end, and so on. A summary page like that would probably lean towards a more minimalist design.

[08:37] Researcher: That's the same as what I was thinking; we would suggest toning down the dynamic effects. But at the same time, we'd also remind you to keep some decorative elements. It can't just be black text on a white background.

[08:53] Designer 3: That's true, just a little bit. Just a little bit of decoration, not too much.

[09:00] Researcher: Next is the interactive section, where we would suggest using various interactive methods to maintain students' attention. For example, kids like to interact with the screen, click on it, or have it give them feedback. So here we would suggest to the designer that you can provide this kind of interaction. In the final 10 minutes, students' attention will fluctuate, and we'd suggest maintaining their

attention without using things that are too “strong.” So that’s the first topic. Do you think this is useful for you? Before hearing all this, would you have thought of these things?

[11:21] Designer 3: It’s quite useful, actually. It’s a bit like a... pre-design guide. A guide for the learning process.

[12:34] Researcher: Do you find this helpful? Or do you feel like, “Oh, this is just common sense,” or “Ah, I could probably figure this out on my own”?

[12:55] Designer 3: Well, I wouldn’t have thought of it in such detail. For example, I might generally know that for certain information parts, I need to do some visual enhancement for the students or highlight key points. And I might think about creating some dynamic interactions to engage with them. But I wouldn’t be as detailed as you are, for example, designing based on the different stages of a lesson.

[13:26] Designer 3: I don’t think I would have gotten to that level of detail.

[13:45] Researcher: This is an idea that combines teaching theory and design. My question is: “Do you think this structure provides effective guidance for your design work, or is it a creative limitation?”

[14:28] Designer 3: A “creative limitation,” in my opinion, doesn’t really exist in the domestic Chinese context. In a service-oriented industry, what designers need more is a very clear and powerful brief.

[14:56] Designer 3: Whether the brief comes from the school administration approaching a design firm, or if the designer directly receives a design guide... when you get a request, if you’re not a designer who specializes in education, you probably don’t understand student psychology either, so you might just... create the materials in a very straightforward way. But if you have a clear set of guidelines like this, which can influence you or give you some... clearer instructions at different design stages, I think that would make things much clearer for the designer.

[16:05] Researcher: The second topic is about contextualized learning and its integration with motion graphics. The core principles are: the narrative must be meaningful, maintain contextual continuity, and be faithful to the theme. We encourage designers to incorporate local, real-life scenarios that students are familiar with, but also to have diversity.

[19:20] Researcher: The third topic is about visual expression, revolving around the choice between using graphics and photos. When you’re designing, for example, to distinguish a bus from a motorcycle, or a student jumping rope from one swimming, do you struggle with whether to use an illustration or a photo to represent it?

[25:02] Designer 3: Based on a more intuitive thought process, it would probably be a more cartoonish style of illustration. Especially for this age group, for second-grade students, I would probably think of using more cartoonish illustrations.

[25:21] Researcher: But, do you ever find yourself in a situation where you’re wondering, “Should I use a cartoon or something else?” Like, between two options, which one would be more suitable for a certain situation?

[25:40] Designer 3: That’s really hard to say. For instance, should I use a photo or something else? A photo might reflect what they actually see in their daily lives more accurately. But if it’s an illustration, especially a more cartoonish one, it’s definitely simplified or stylized, which might be different from what they encounter in real life.

[26:07] Researcher: Our guide would point out that photos are more realistic and suitable for depicting reality or scenes rich with elements. Illustrations, on the other hand, lean towards the abstract and are better for expressing ideas, processes, or other abstract concepts, or for highlighting the teaching point itself.

[30:40] Designer 3: Regarding the whole topic of illustrations versus photos... I actually hadn’t thought about that before. Generally, from a conventional thinking perspective, my initial thought would be to first consider the user’s age. For example, if you set the target as first-graders, I would immediately think of using more cartoonish illustrations. I wouldn’t think about controlling the ratio of real photos to illustrations, or whether realistic graphics might lead them to unintended associations.

[31:30] Designer 3: That’s something I definitely wouldn’t have considered. Not without this kind of guidance.

[31:35] Researcher: The fourth topic is a modification guide for teachers. Because teachers need to modify the PowerPoints after receiving them, but they often don't know how. So this topic is about how we, as designers, need to leave room for them to make modifications and provide instructions on how to do so.

[33:20] Designer 3: That makes sense. Teachers are already so busy. You should just put it in the notes section.

[33:33] Researcher: So, as a designer, is your intuition that since teachers don't know design, you should just create a fixed, very smooth-to-use PowerPoint for them and be done with it?

[33:53] Designer 3: I don't think so. I think, based on their own teaching needs, there will always be some need for dynamic adjustments. For example, the text content. If they need to make changes to the length of a sentence or alter the sentence structure, you can't just give them a fixed set of courseware. There definitely needs to be room for modifications. And that includes things like changing the position of graphics or replacing images; those should also be possible.

[34:39] Researcher: The point of this topic is that we need to remind designers that your work can be modified, and you need to consider the difficulty for teachers to make those modifications. Do you think that's common sense?

[35:08] Designer 3: For a designer, not necessarily. They might just cluelessly hand it over. For example, I often have to ask them for the source files because we need to keep a record. Because who knows, maybe later we'll need to make changes, or we want to reuse this courseware template. In that case, we'll definitely need to make modifications.

[35:54] Researcher: The fifth topic is about visual cues and visual consistency. For example, using different character images as contextual markers, and these visual elements should be taken directly from the textbook to maintain a connection between the presentation and the book. Also, characters need to be consistent throughout a lesson.

[37:50] Designer 3: This one seems a bit more like common sense. Because generally, you would need to connect with the characters in the textbook. The PowerPoint and the textbook can't be two separate sets of content. I feel like most people would have a sense for this.

[38:24] Researcher: The sixth topic is intuitiveness. It means reminding designers not to have any "guessing" elements. Avoid subtle hints or implicit suggestions, and also avoid ambiguity, so they don't have to think one step further to understand it.

[39:39] Designer 3: Oh, I know. Because adults' thinking is different from children's. We might take it for granted, or the designer might take it for granted that when you see this, you'll think of that. But for a child, that's not necessarily the case.

[40:13] Designer 3: This one, yeah, this is something that probably needs to be pointed out. It's about telling designers not to... think too much from their own perspective when they're designing. It's like they need to adopt the user's perspective to look at the issue.

[40:34] Researcher: The seventh topic is the impact of familiarity. For example, if we use familiar cartoon characters (like Doraemon), they are very willing to engage. But at the same time, using completely new scenarios or characters, if too complicated, might make them feel scared. We bring this up to get designers to think about how the familiarity of different elements affects students' reactions and state of mind in class.

[42:35] Designer 3: I hadn't really thought about that before. I don't think I would have thought about it to that extent, about the familiarity of the content for the lesson.

[43:18] Designer 3: Well, if you tell me that I need to consider this aspect for students, then I would indeed need you to clearly explain to me... at what level or stage I should do certain things. I might need more detailed guidance. Because this is a bit abstract for a designer.

[44:45] Designer 3: Everyone would want something more concrete, especially for something this abstract.

[45:01] Designer 3: (Upon seeing examples of specific guidelines) This, this is very practical. This is what designers love to see the most.

[46:38] Designer 3: And readability, right? Otherwise, they can't even read it.

[49:14] Designer 3: Just give me a clear and direct guide.

[49:37] Designer 3: Right, because that's how design is in China. Even commercial design now is like that. They don't think about why they should use this font, or why they should use this colour. The best-case scenario is that the client or someone just decides for them, "I want, I like this font," or "Our company's standard font is this, you can't use anything else." They'd love for it to be like that. And then what font size to use, just give them a brand visual identity system manual, and they can just copy from it. They won't think about why, in the end, they should use this font.

[51:27] Designer 3: But it's true, I'm telling you, in China, this is what they like. You give them a font, a heading size, a subheading size.

[51:35] Researcher: But we're having an academic discussion here, so I have to elevate it to a theoretical level. I'm giving you this guide not as a brand manual, but for you to read and then have this thought process: why should I use this? Because of the theory behind it.

[52:12] Researcher: Ninth is about colour. Tenth is about sound, for example, the human voice should be more natural, and using a student's voice is better than an adult's. There are also supplementary points, like animation triggers—whether to use automatic or click-triggered; and that page-turning transition effects are encouraged. This is the whole design guide.

[54:56] Designer 3: (Summarizing feelings)

[55:35] Designer 3: Right, right, I think it integrates things like student psychology and educational theory. So there are indeed some things that a designer wouldn't think about.

[56:37] Designer 3: Let me think for a moment. For example, the points you raised earlier, like the level of familiarity, and the use of photos versus illustrations—those are things I wouldn't have really thought about before. Especially in the context of educational materials. Like, how exactly should I use photos and illustrations, to what extent, what's the percentage, or what's the process for using them... that's something I really wouldn't have considered.

[57:22] Designer 3: And then, for example, the use of motion graphics. I might have a general sense that I should use motion graphics, but how to specifically apply them to the level of detail you're talking about... I probably wouldn't have gotten to that level of detail.

[57:59] Designer 3: I think what's more common sense is that a designer would know that when making courseware, I need to make the visuals stand out, I need to create some interaction, I need to make the content look good, and I need to design some interactions based on the learning level. But for some of the very specific, or very in-depth aspects of student psychology, especially for very young learners, their "sense" for that might not be as developed.

[59:02] Designer 3: (Regarding interaction) That's something they wouldn't know.

[59:47] Designer 3: (On whether "flashy" and "simple" are contradictory) It's not necessarily a contradiction. "Flashy" doesn't necessarily mean "meaningful." When we say "not too flashy," we probably just mean not to include meaningless... graphics, illustrations, or visual content. Things that don't contribute to the overall content, that are purely decorative. Those are things that can certainly be added or removed. Because some designers, when they're designing, they might see an empty space and just want to fill it with something. But in terms of the content, it's meaningless. This kind of situation does happen.

[1:01:39] Designer 3: But we (designers) want to get to the point of you telling me what to do. I think for a designer, since you've raised this question, they would probably want to know how to solve it. So they would probably hope that you could tell me how I can do it. Or, for example, what directions to try.

[1:03:18] Designer 3: (The guide) is not hard to understand. If you're going to lay it out, you'll probably have examples and case studies, right? With those examples, it won't be hard to understand.

[1:04:04] Designer 3: But because your guide includes educational... because it includes educational concepts and that kind of stuff, it can't be as... rigid as the latter, like, "heading is this size, subheading is that size, use this colour here, that colour there."

[1:05:37] Designer 3: But the feedback they (teachers) give about the classroom, or the students' cognition and thinking at a certain stage, is something we can't get on our own. Is that something a designer would have common sense about? I don't think so. How would a designer know that?

[1:06:56] Designer 3: Right. A very professional designer also has to do research. So your work saves them the research process.

[1:07:09] Designer 3: What's lacking right now in China is this user perspective. It doesn't exist.

Interview Transcript Designer 4

Interviewer: Researcher
Interviewee: Designer 4

[00:53] Researcher: The background of my research is on how second graders in Guangzhou learn English vocabulary. They use PowerPoints in class now, and I'm collectively calling everything in these PowerPoints "motion graphics." After talking with teachers and blending various theories, I've developed a set of design guidelines. Now I'd like designers to look at these guidelines and see what they think. My biggest concern is that these guidelines might feel like they're just stating common sense.

[07:57] Researcher: The first topic is about motion graphics design, the lesson flow, and attention. Simply put, a lesson is divided into several stages, and in different time segments (0-5 minutes, 5-20 minutes, etc.), motion graphics play different roles. For example, at the beginning, we would suggest using a video or high-contrast visuals to capture students' "involuntary attention." In the middle of the lesson, when students' attention is most focused and the teacher is introducing new material, motion graphics should be toned down and not be too fancy. In the later interactive exercise part, game-like motion graphics should be designed to maintain their engagement. Finally, as the class is ending, the role of motion graphics is to try to maintain their already tired attention. For this first topic, what are your thoughts?

[12:21] Designer 4: I think adding motion graphics to the foundation you showed me would definitely be helpful. I understand you're saying that at different stages of the courseware, for instance, at the beginning, the motion graphics might be more dynamic and intense, and at another stage, they might be weaker so as not to distract them.

[12:46] Designer 4: That makes sense.

[12:51] Researcher: So, imagine this scenario: you're a designer, and you get a request to create a PowerPoint or courseware for in-class use.

[13:16] Designer 4: Let me give you an example. What you're describing is very similar to what I'm currently using. Our company's courseware is called HyperClass, and its logic is dynamic interaction. For example, in an online class, the teacher is in front of a green screen, and the system can switch to various scenes. If teaching travel vocabulary, the background could change to an airport, and there would be PNG layers of a passport or ticket appearing in front of the teacher. This is very similar to what you're calling motion. As for whether it's useful, I definitely think it is. This is what people have been talking about lately, this immersive experience.

[15:00] Designer 4: If I were a designer and you gave me a guideline like this, I think a potential issue would be, how exactly should I make it move? For example, at the beginning, there are many ways for things to move. I think it might be better to be more specific about the form of motion. For example, should it be typographic animation, should the text's movement be related to the scene, or how should an appearing image move? It might need more detail on how things should move to be clearer.

[15:44] Researcher: So, it sounds like when designers hear "guideline," their first reaction is, "Just tell me what to do."

[15:55] Designer 4: No, not "tell me what to do." From a designer's perspective, you could tell me the purpose of the motion. Is the goal to attract their attention? If I'm making a motion graphic just to get students' attention, then I could use stimulus intensity or strong contrast, that's one way. Another way, like at my company, is to make it very realistic with interaction within a scene. I think the form of interaction could be more detailed or standardized to be clearer. It's not necessarily about telling me exactly what to do, but telling me the purpose. Is the purpose of the motion just to make the screen move, or is it to make the scene feel more realistic, or is it related to the theme to help connect it with the teaching content later on?

[18:57] Researcher: So, will designers already know these processes? Is this also just common sense?

[19:13] Designer 4: Not necessarily, I don't think so. If I'm a designer and I don't know this, I might just do it based on my own feelings. I might put a lot of animation at the beginning, but another designer might put a lot of animation in the middle. I don't think that's a given.

[20:23] Designer 4: Actually, one of the points you made in the middle seems to be exactly like what we have now. The products and courseware we have, in actual use by students, follow a similar logic. That kind of thing (a flashy opening) is actually more of a hook, a gimmick from a marketing perspective. But just like you said, you start with something very attractive for kids, but in the actual learning process, if you do too much of this, it can actually interfere with their learning and distract from the main point. It becomes a distraction.

[21:51] Researcher: The second topic is about scene construction. We found that teachers strongly require the scenes to be meaningful, narrative, and coherent. For example, if a theme's vocabulary is taught over five classes, then the scenes in those five classes need to be continuously linked under this theme. The design strategy is to be grounded in real life, because students respond more strongly to familiar environments. Also, even with a cartoon style, it needs to be connected to reality and not be completely fantastical.

[23:57] Designer 4: My point on this is, if you don't tell me, I wouldn't know. If no one tells me about this, I wouldn't know this logic. As a designer, I would just design based on the content I'm given; I wouldn't know that these principles are needed. For instance, building meaningful, narrative scenes—if you don't mention it, I wouldn't know what that means. I don't have that concept. The coherence of scenes, I don't have that concept either. I would just look at the content and design, and if the content comes from different people, the narrative logic will definitely be inconsistent. So what I present would be even more disconnected. So having this would definitely be helpful.

[24:53] Researcher: So, when your designers are creating the green screen scenes, do they naturally have an awareness of coherence or ensuring elements are loyal to the teaching content?

[25:31] Designer 4: Possibly not. From what I've seen of how it's actually done, from a design perspective, I would create many templates. But how they are actually pieced together is up to the teachers who use them. Applied to your situation of a single PowerPoint, as the creator, I see the content I'm given, but I wouldn't think about it so comprehensively. I wouldn't think about things like coherence or the overall theme from start to finish.

[28:14] Researcher: Yesterday another designer felt that terms like "building meaningful scenes" were a bit vague.

[28:24] Designer 4: Yes, it is a bit vague. You could be more specific, like what does "meaningful" mean? How can you express that? Does it mean it has to tie back to the theme, or that the motion effects, graphics, or content have to be related to the theme? You mentioned one point, about motion effects that are irrelevant to the theme and just for fun. That point needs to be explicitly stated. If you don't write it down, many designers might think something is fancy and visually cool, but that doesn't necessarily mean it's helpful for learning.

[29:21] Researcher: The third topic is about the use of photos and illustrations. This choice affects the students' cognitive path. Simply put, photos are for perceptual, scenic, and complex things that can be explained in one picture. Illustrations are for abstract concepts, like the process of a thought, or when you need to isolate an object to highlight it. And students are generally more interested in illustrations and cartoon styles.

[31:43] Designer 4: I roughly understand what you mean. I think it's definitely useful. But I think what you're mainly trying to say here is about when to use illustrations and when to use photos. I think one point that might not be very clear, if I were a designer, is that the principle isn't strong enough. For example, you said illustrations should be the main element, and photos are supplementary. A designer could understand this as illustrations defining the style of the entire courseware. The overall visual style is illustrative. But the real-life photos are part of the content, not the style. For example, if an illustration can't convey a real-life scenario, you have to use a photo. But throughout the lesson, the illustration is a visual style, while the photos are a necessity for the courseware's content.

[35:00] Researcher: The fourth topic is a motion graphics modification guide for teachers. The key point is that we, as designers, need to leave room for modification and include simple instructions on how to do it within the PowerPoint itself, not in a separate lesson plan.

[36:32] Designer 4: That's right, that's necessary.

[36:46] Designer 4: This part is for teachers, and teachers are not designers, so they might not understand it. But for designers, this is very easy to understand. So if you present this... a designer might think it's stating the obvious, just fluff. But for a teacher, I think it's necessary, it's very necessary.

[37:18] Researcher: No, this is to tell designers that they need to leave this room for modification.

[37:26] Designer 4: Right. For me as a designer, if you tell me to leave an editable text field, that seems fine. Making things replaceable and adjustable is a very standard requirement for me. But for the teacher, the actual user, it's very important. But if you don't tell the designer this, the designer might not do it, which in turn won't be helpful for the teacher. This is something that, for a designer, might seem obvious, but it still needs to be clearly stated and implemented.

[38:58] Researcher: The fifth topic is about visual cues and visual consistency. For example, headings and buttons should have a consistent design to reduce students' cognitive load. Characters can be used as markers, like a teacher character appearing for a summary. And we suggest designers use characters and images from the textbook to avoid a visual disconnect between what students see in class and in their books, which can cause a cognitive break.

[40:54] Designer 4: It's like before, it's necessary to point it out. It's a guideline. It's necessary. Otherwise, the way I do it would be like this, but another designer might do it differently.

[42:10] Researcher: But if this isn't explicitly stated, would people think to do it?

[42:16] Designer 4: If it's not stated, they wouldn't.

[42:43] Designer 4: No, I think this really depends on the person who gives the brief. It's based on the requirements. If the requirements clearly state that it needs to be integrated with the textbook, then it will be. If it's not mentioned, then they might just create it on their own.

[43:02] Researcher: But the person who gives the brief is usually the teacher, and the teacher might not think to mention this.

[43:11] Designer 4: Right, so this is something you need to bring up with the designer.

[43:23] Researcher: The sixth topic is about intuitiveness. For elementary school students, there absolutely cannot be anything that requires guessing, is ambiguous, or needs deduction. It has to be very direct.

[43:47] Designer 4: I'm not sure about that. But for teaching English, I think it's quite important. You're using images to convey meaning because you're teaching a language. If students don't know the words, they can't learn. Using images removes the problem of not understanding the meaning; they will definitely know the meaning, they just don't know how to express it in words. So using images can help.

[44:54] Researcher: The seventh topic is about the effect of familiarity. Students react differently to familiar and unfamiliar content and visuals. For example, a familiar cartoon character like Peppa Pig will easily capture their attention, but it could also distract them if they focus too much on the character. Unfamiliar content might make them feel scared.

[46:24] Designer 4: A little bit (abstract). You've said it, and there's nothing wrong with it, but what's the purpose of saying it?

[46:43] Designer 4: Well, yes, so what should I do? Should I make things familiar or unfamiliar? I'm not sure. What you're saying doesn't sound wrong, but it doesn't give me any practical guidance for my design work.

[47:42] Researcher: I bring this up because teachers observed this characteristic in students. I thought this might influence designers. For example, if a designer wants to increase attention in a certain part of the lesson, using "familiarity" could be a tool. A straightforward example is using Peppa Pig versus a generic character. Of course, Peppa Pig would be more easily noticed. So, in the latter part of the class when they're tired, I might use Peppa Pig then. It's to give designers this way of thinking.

[49:23] Designer 4: That does make sense. If you explain it that way, it does seem to be the case. But it seems like it's not clearly explained in your document.

[49:35] Researcher: Moving on, the following parts are more practical design suggestions, like text, fonts, and colours. Do you think specifying font sizes is just fluff?

[51:56] Designer 4: I don't think it's fluff. For someone who's experienced, they might think it's fluff, but for someone new to this, I don't think so. For example, you mentioned a minimum font size of 12pt for chapter titles. I don't think it's fluff.

[52:30] Designer 4: I don't think it's fluff. When you're actually doing UI or other things, this is needed. But, I think you need to specify the reason. For example, why 12pt? Because (in parentheses) it's for classrooms where students are close to the screen. And at the top, the minimum recommended size is 28, to ensure that even the students in the back row can see clearly. You need to state the reason.

[53:42] Designer 4: Yes, right. So, this is very contradictory. For example, for 36pt, I think you should add a note, saying it's to create a hierarchy with the body text, maybe two or three times larger to really establish that hierarchy. You need to give a reason like that. As a designer, give me a reason, and then I'll understand why.

[54:14] Researcher: So this is just a suggested size. So the reason is the most important thing. I need to let designers know that a size hierarchy is needed, and the guideline needs to tell me about the logic behind it. The minimum suggested size is 28pt so that people can see clearly, so even if the layout is crowded, I won't shrink this font size because it will be hard to see.

[55:05] Researcher: The ninth topic is about colour. I'm considering deleting this one because the topic of colour is a very big topic.

[55:22] Designer 4: It's a bit abstract. I think you could mention the colour for highlighting, like red, or black for readability. But the part above about "high-saturation colour schemes are more popular," I can argue against that, saying that if the saturation is too high, it's not good either, right? You either explain it clearly, or you don't mention it at all.

[56:40] Researcher: Finally, there's sound. It's just a brief mention that voiceovers shouldn't be too robotic and children's voices are more popular than adult voices. A supplementary topic is animation triggers (automatic vs. click-triggered), and that transition effects like page turns can enhance the experience.

[58:03] Designer 4: (Summarizing) I don't think it's entirely "said it but didn't really say anything." I think it's necessary. But as you said, to avoid that feeling, I think one point is that you need to lay out the rules and explain the logic behind them. And I think you should talk about what to avoid, rather than telling people what they have to do. Because the design possibilities are too many. If you tell me what to avoid, then I know that's a rule. But if you tell me I have to do something a certain way, then that becomes very restrictive.

[58:48] Researcher: I was talking with another designer yesterday, and he felt that some designers want a design guide to be like a brand style guide, just telling you what to do. Another type of designer finds it more interesting and useful if you tell them why, so they can think about it.

[59:41] Designer 4: Right, you tell them the reason. I think that your document, first of all, should be centred around the goal of English language teaching for second graders, and you create the guidelines based on that. For those guidelines, you should probably give them a range, and what not to do, what the bottom line is. Not telling them they have to do something a certain way. But if you do say they must do something a certain way, that's okay too, but you have to explain the reason very thoroughly. For example, the font size you wrote about. Why that font size? Because you want to avoid a situation where the students in the back can't see. I think that in your context, that makes sense and is necessary. And for me as a designer, if you don't tell me this, I wouldn't know. I might make it very small, maybe even 6 or 7pt, for the sake of aesthetics in a PowerPoint. So, first of all, state the guideline, and after you state it, you have to tell them the reason. The purpose of all this is to serve the goal of teaching language to second graders.

Interview Transcript Designer 5

Interviewer: Researcher
Interviewee: Designer 5

[03:55] Researcher: As long as you are a graphic designer, it's more or less... for example, if you got this task, could you do it? Would you do it? Like, if a teacher came to you and said, "Xiao Zhou, can you help me make a PowerPoint for my class?" Would you do it?

[04:24] Designer 5: I would. Yes, I would extract the key knowledge points and then find images to go with them.

[04:31] Researcher: Right, exactly. So this document is to guide you while you're making the PowerPoint, telling you, "This is how they teach," and "You might need to pay attention to these things when you're

choosing images or colours." Or I might recommend using a certain colour and not using another. It's like that.

[04:55] Researcher: Okay, the first topic is about dynamic graphics in relation to the lesson flow and student attention. Simply put, during different stages of the class (input, internalization, output), a child's attention curve fluctuates. This section will tell the designer what kind of methods to use at each stage to capture what kind of attention. I'd like to ask you a question first. In an English class for young students, which stage do you think is the most important?

[06:32] Designer 5: The introduction stage, I think. Arousing their interest is more important.

[06:38] Researcher: Okay. Then, during the new lesson stage and the later practice stage, how would you design the visuals, like the PowerPoint or dynamic graphics? Would you try your best to make them very beautiful and interesting?

[07:08] Designer 5: I feel it needs to be a bit cute, and also simple... or rather, eye-catching. Because I feel that young students might have shorter attention spans, so you need to make it eye-catching and very clear so they can see the points they need to pay attention to.

[07:25] Researcher: Okay. So, in different stages, for these cute, pretty, and highly engaging animations or illustrations, do you think there should be different levels of intensity? How would you arrange it?

[08:32] Designer 5: Well, I would think that during the introduction, you need something that can spark their interest to attract them and get them to listen to the lesson. Then, during the main lesson, as I said before, the knowledge points should be listed very clearly and be eye-catching, without too many distracting elements. For the interaction part, it probably needs to be more fun. For example, you could play fill-in-the-blank games with them, or spot-the-difference, and things like that. It would involve designing some small games that can spark their interest and also check if they understood the lesson's key points. For the final summary, I would probably make it look a bit nicer, so they might be more willing to remember it.

[09:46] Researcher: Okay. So, your intuition is actually quite similar to what we found. The most important point is, as you said, when teaching new content, we discovered a relationship where the intensity of the dynamic graphics should actually be lowered. Then, when it comes back to the interaction part, the intensity should be increased. This is because we found that when teaching new material, the children's attention is already very high; it's the natural fluctuation of their attention curve. So at that time, we use graphics in a way that avoids having them compete for their already high attention.

[11:01] Researcher: So, do you think this first topic is helpful to you? Is it inspiring, or something you hadn't thought of before?

[11:33] Designer 5: Well, after you explained it, I'd definitely be more conscious of it.

[11:49] Designer 5: I feel what you said makes a lot of sense. At the beginning of the main lesson, their concentration is high, so you shouldn't distract them. The information should just be simple and clear. Then, during the interactive part, you want them to consolidate their learning, so you'd want them to practice more. How do you get them to practice more? You'd design some mini-games, like level-clearing challenges or something similar, so they can play it a few times and achieve the goal of reinforcement.

[12:25] Researcher: So, do you find this inspiring and novel?

[12:33] Designer 5: It's quite inspiring.

[12:38] Researcher: The second topic is about dynamic graphics and scenario-based learning. This section will advise that within the graphics we use, there should be the creation of a scene. We need to pay attention to making it a complete scene and ensuring that all elements within the scene serve that scene. A very important point is the continuity of the scenes. For example, if the theme of a unit is seasons, the scenes in the lessons can't suddenly have something detached like car racing. Another point is about realism and immersion; we found we should use more scenes from the children's daily lives because they connect more with them. Finally, even when using the cartoon style that kids prefer, it can't be too fantastical; it needs to be grounded in reality.

[15:24] Designer 5: I think I understood it after you explained it.

[15:28] Researcher: You wouldn't have known without the explanation?

[15:31] Designer 5: Without the explanation, I might not have thought it through so comprehensively. I

mean, I might have incorporated some of these ideas into my design, but I probably wouldn't have followed all the rules. But after you explained it, each step becomes much clearer.

[15:51] Researcher: The next topic is about the use of images versus illustrations. When we are designing, when should we use cartoons (illustrations), and when should we use photos? This section will tell you that the expressive function of photos versus illustrations differs. Photos directly connect to reality and are suitable for expressing real scenes or complex concepts. Illustrations are better at expressing abstract concepts, like "Xiao Ming had an idea." Based on teacher feedback, we suggest using illustrations as the main visual element because kids prefer them, with photos used as support. At the same time, when choosing a picture or illustration, you must avoid things that are too complex or ambiguous. For example, a picture of a little girl eating ice cream while wearing a thick padded jacket would make kids ask, "Why is she eating ice cream in the winter?" sparking unnecessary discussions.

[21:00] Designer 5: Then, in that case, I'd know. For things that can be photographed in real life, or as you said, can be represented by photos, I'd use photos. That would likely be closer to their real-life scenarios. If a photo is difficult to achieve, or if there's no ready-made material, then I'd probably use cartoon graphics. Or for some things that are hard to express, if I want to convey it more simply or in a cuter way, I'd use graphics.

[21:48] Researcher: You can apply this to your own work. The purpose of this document is to remind you that beyond those basic, general concepts you already have, its goal is to go deeper, be more specific, or, from a theoretical level, tell you, "The reason you do this might be because of A, B, and C." And if you know about A, B, and C, then working backward, your approach can be more diverse. Is this material inspiring to you?

[23:01] Designer 5: It is. Because I usually might not pay attention to this deeper level of methodology. But after you've said it, next time, for instance, if I really work on something for young students, I'll probably be more conscious of following the methods you described.

[24:34] Researcher: The fourth topic is that when making these course materials, we found that designers cannot make the materials too "rigid." Normally, one might think to make a perfect script for the teachers to use directly. But we found that teachers need space to make their own modifications. So, conversely, for designers, this means we need to leave "empty space" in the design to allow those teachers to make their own customizations. Also, we need to provide small tips within the PowerPoint itself to teach them how to make changes.

[26:02] Designer 5: I think, for teachers, they would probably prefer you to give them a PowerPoint template. Meaning they can directly insert pictures and fill in the knowledge points they need to cover. Or, you could provide them with a pre-made framework, and they can just add the content they want. They might not be that sensitive to design, or maybe they aren't very skilled at it.

[28:26] Designer 5: Right. So what I mean is, you can just design it well for them. They only need to change the content inside, or maybe just delete or reorder the main points.

[28:36] Researcher: Right, right. Oh, right. If you put it that way, that's the correct way to express it. So that means you can allow teachers to have the space to adjust the priority and content.

[29:40] Researcher: Second, they need to be able to... as you said, to preserve the possibility of modification.

[30:32] Researcher: As you can see, in these new slides I made for testing, I have this section here, "Modification Instructions," which teaches them how to change the content that they might need to change. It's about pre-empting what they might want to change and providing guidance for them.

[31:23] Researcher: Okay, the fifth topic is about visuals... that is, visual cues and consistency. There are two main points here. One is that for these so-called functional elements, designers are reminded to maintain consistency or similarity in design. This creates a visual cue, so when students see these things, they can quickly understand what they need to do, reducing their thinking time and the teacher's explanation time. Another point is about consistency, which extends to reminding the designer that the content on the PowerPoint and the content in the textbook need to have a certain connection and consistency, to prevent a disconnect where kids see one thing in class and something completely different in their textbook at home, causing a cognitive break.

[34:17] Designer 5: Then I think the illustrations used in the textbook and the PowerPoint need to be the same, or have repeated elements. And also, things like titles should probably use the same ones from the textbook. Like main titles, subtitles, that kind of thing definitely needs to be from the textbook, otherwise

they won't be able to orient themselves.

[34:54] Researcher: Have you thought about this concept before?

[35:01] Designer 5: No.

[35:04] Researcher: So if you were tasked with making a PowerPoint, would you think to use content from the textbook?

[35:10] Designer 5: Ah, I would. I would think to use the titles from the textbook—main titles, subtitles, and unit names, that kind of thing.

[35:16] Researcher: But that's on the content level. This is a reminder on the visual level.

[35:23] Designer 5: On the visual level, I would also use the same illustrations.

[35:41] Researcher: If I didn't bring this up, would you have the awareness to do it?

[35:46] Designer 5: I would. Maybe not the colour scheme, but the illustrations and titles would definitely be consistent.

[35:55] Researcher: Then, the sixth topic is so-called "directness." This is to remind the designer that because it's for second-graders, all your visual elements cannot be inferential or metaphorical. You have to express things very directly. Kids won't guess; what they see is what it is.

[36:35] Designer 5: Uh, this is something I'm aware of. For example, if this lesson is about cleaning supplies, what a broom is, what a mop is, I definitely wouldn't put them all together. I'd present them separately.

[36:52] Researcher: Mmmhmm, but sometimes people might provide images or cartoons that are inferential or metaphorical, which can cause ambiguity. So this is just to remind you again.

[37:18] Researcher: Then the seventh topic is about the impact of familiarity. This section explains that children's reaction to familiar things is different. There are two levels to this: content and visual representation. For familiar content, like cartoon characters they know (like Doraemon or Peppa Pig), their reaction will be stronger. But at the same time, these familiar things might overshadow the main lesson content.

[39:27] Designer 5: I didn't understand how I'm supposed to express this familiarity.

[39:32] Researcher: It's not about expressing familiarity, it's about utilizing it. First, I will tell you how students might react to familiar versus unfamiliar content. Then you can use these two things as your tools. For example, during the interaction stage, I could use a familiar knowledge point or character to first capture their attention and get a stronger reaction. Then, I can introduce new, unfamiliar content to help them transition. Of course, you could also start with unfamiliar content to spark their curiosity.

[40:31] Designer 5: Ah, I see. So it's two different approaches.

[40:33] Researcher: Right. It's to tell you about the different possible reactions they might have. And then let the designer take this tool or this way of thinking to arrange the visual elements they use.

[41:31] Researcher: What do you think of this point? Is it new to you, or what's your take?

[41:39] Designer 5: Mmm, I think I probably wouldn't normally be aware of this, but now that you've said it, I might think about it.

[41:47] Researcher: And, don't you think this part is a bit vague? A bit abstract?

[41:55] Designer 5: Yes, it is abstract. The concepts of "familiar" and "unfamiliar" — your description is a bit abstract. But your example earlier, about using a game as an illustration, that made it easier for me to understand.

[42:23] Designer 5: Um, I think if you use practical examples to explain it to me, it would be clearer than just using abstract text.

[42:38] Researcher: Okay. But do you need the explanation behind the case study, the "why"?

[42:44] Designer 5: Um, you can explain it, but don't just have text without any case studies.

[43:08] Researcher: Then the eighth one... this one is very practical. It tells you what font size to use, what colours to use, what colours to avoid... Yes, this one is much clearer and more direct.

[43:22] Researcher: Okay. But you lean towards this kind of guideline, right?

[43:25] Designer 5: Yes.

[43:27] Researcher: Okay. Then there's font selection. It will recommend fonts, but also tell you a key point... if the students are learning how to write words and letters, then your font should probably lean towards a handwritten style. This is because it will better help them understand or avoid confusion about how the letters should actually be written.

[44:14] Researcher: Is that helpful?

[44:16] Designer 5: I think providing this kind of tip is useful. Because if you don't, they might just default to using fonts they normally use in design, which might not be suitable for young students.

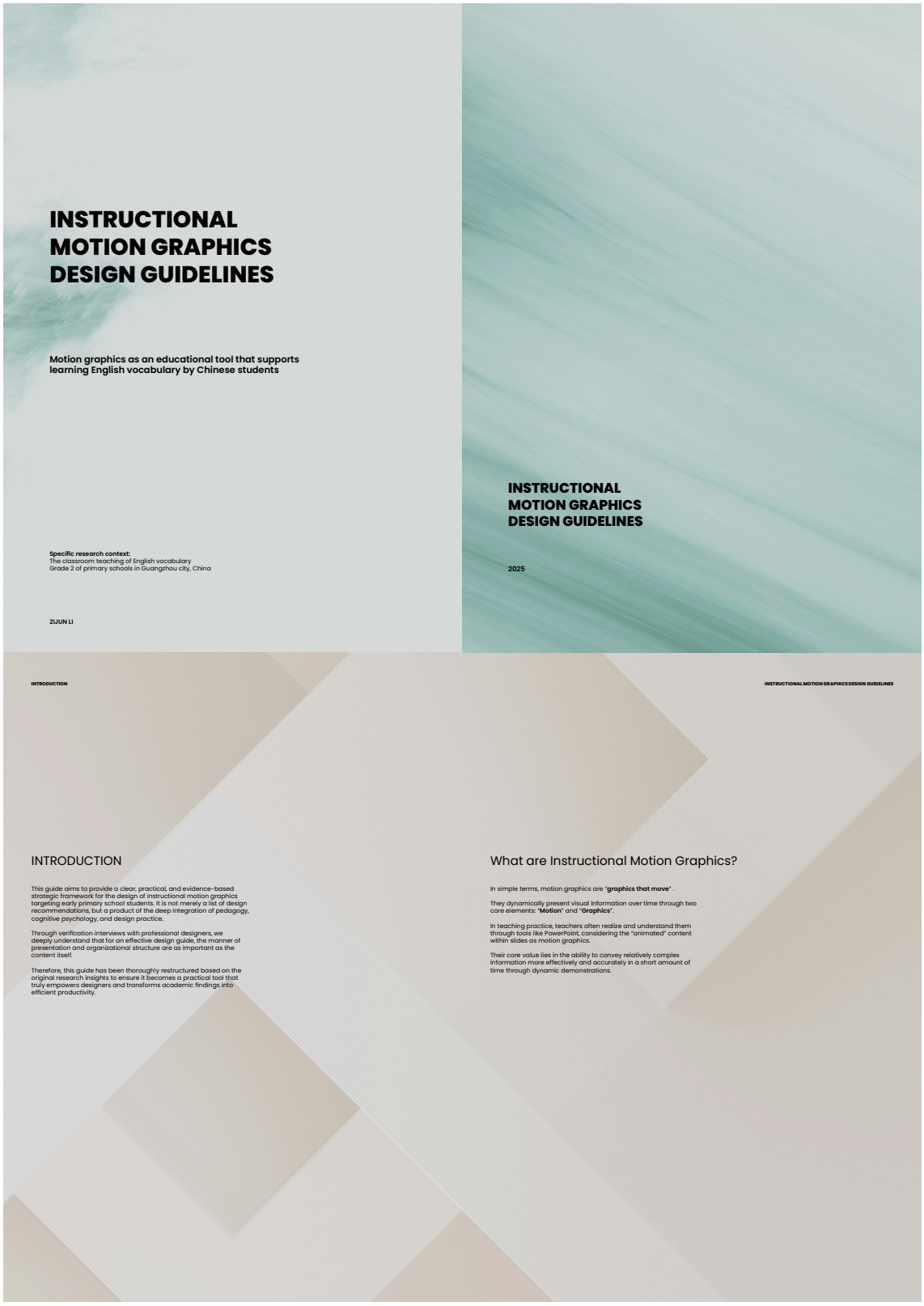
[44:33] Researcher: The ninth is colour. The section on colour here is quite superficial because it's a whole other huge topic. It will talk about things like saturation and vibrancy. Of course, kids like saturated, vibrant colours, but there's a limit. I just briefly mention that from what I've learned, they tend to prefer cooler colour tones, and they should avoid using green tones because it's too similar to the colour of their blackboards and can cause fatigue.

[46:35] Researcher: And the last topic is about sound. Sound is something I haven't tested, but I can just tell everyone... sound effects are accepted and even encouraged, but not too many. For children, real human voices are better than AI voices. A child's voice narrating is more engaging and better received than an adult's voice. After that, there are some supplementary topics, like the triggering of dynamic effects, because in PowerPoint, you can have on-click triggers and automatic triggers. It will tell them where to use each, with suggestions. Finally, it's about the transition effects between each slide. Teachers feel that logical transition effects, like a page-turning effect, make it more fun for the students.

[48:21] Researcher: Do you think this kind of thing has an inspirational quality for you?

[48:37] Designer 5: It feels a bit like a tutorial, telling me how I should do things, what would be better.

Final full version of the design guidelines



INSTRUCTIONAL MOTION GRAPHICS DESIGN GUIDELINES

Motion graphics as an educational tool that supports learning English vocabulary by Chinese students

Specific research context:
The classroom teaching of English vocabulary
Grade 2 of primary schools in Guangzhou city, China

ZIJUN LI

INSTRUCTIONAL MOTION GRAPHICS DESIGN GUIDELINES

2025

INTRODUCTION

INSTRUCTIONAL MOTION GRAPHICS DESIGN GUIDELINES

INTRODUCTION

This guide aims to provide a clear, practical, and evidence-based strategic framework for the design of instructional motion graphics targeting early primary school students. It is not merely a list of design recommendations, but a product of the deep integration of pedagogy, cognitive psychology, and design practice.

Through verification interviews with professional designers, we deeply understand that for an effective design guide, the manner of presentation and organizational structure are as important as the content itself.

Therefore, this guide has been thoroughly restructured based on the original research insights to ensure it becomes a practical tool that truly empowers designers and transforms academic findings into efficient productivity.

What are Instructional Motion Graphics?

In simple terms, motion graphics are "**graphics that move**" .

They dynamically present visual information over time through two core elements: "**Motion**" and "**Graphics**".

In teaching practice, teachers often realize and understand them through tools like PowerPoint, considering the "animated" content within slides as motion graphics.

Their core value lies in the ability to convey relatively complex information more effectively and accurately in a short amount of time through dynamic demonstrations.

Chapter: 1

CORE STRATEGIC PRINCIPLES

In this part, we first establish a macro-level design mindset. These principles are the cornerstones of all specific design decisions, intended to help you think from the strategic level of "why we do it."

Topic 1

Matching the Rhythm of Teaching:
DYNAMICALLY REGULATING COGNITIVE EFFICIENCY AND LEARNING MOTIVATION

Core Strategy

Design must serve and dynamically match the flow of classroom teaching. The core lies in finding a dynamic balance between two seemingly contradictory goals: "cognitive efficiency" and "learning motivation."

"The Core Paradox of Design"

Cognitive Efficiency

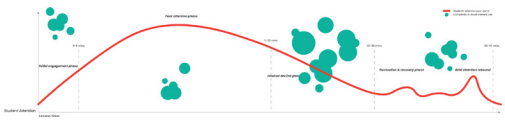
Minimizing the learner's unnecessary extraneous cognitive load. It requires the design to be simple, consistent, and predictable to reduce the burden of information processing.

Learning Motivation

Arousing and sustaining students' situational interest and persistent effort. It relies on novelty, engagement, and diverse elements to attract and maintain attention.

Dynamic Regulation Model

An excellent design does not choose one over the other. Instead, it strategically focuses on one goal depending on the teaching stage to achieve a synergistic effect. Our designs should not fall into the dilemma of being "too repetitive and thus boring" or "too novel and thus distracting."



The relationship between changes in students' attention and the complexity of visual element usage

Stage 1

Lesson Introduction (0-5 mins)
TRIGGERING AND GUIDING

Strategy

Trigger involuntary attention

Quickly capture students' attention at the beginning of the lesson to guide them into a learning state.

Design Methods & Application

Effective attentional anchor
Use video clips or animations as the opening section. Videos stimulate students' interest through continuous images and motion.

Visual design strategies for attracting attention

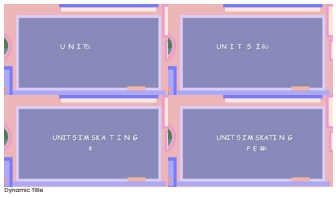
Strong contrast between stimuli
Size contrast (e.g., large vs. small objects) enhances visual impact.

Stimulus intensity
Images and graphics are more effective than text. Color contrast is more visually appealing than text features (e.g., font style).

Novelty and uniqueness
Novel or unfamiliar visual elements trigger students' curiosity. Repetitive content or format reduces interest.



Static Title



Dynamic Title

Simple suggestion:
Add simple motion effects to static titles.

Why

Young students' self-regulation abilities are still developing, making their attention more easily captured by external stimuli, this is "involuntary attention".

Among all visual elements, **moving objects** have the highest priority in capturing the human visual system.

What to avoid

Note: While novelty stimulates curiosity, overly unfamiliar content may be hard to understand and cause cognitive load. Design should balance capturing attention with avoiding cognitive overload.

Stage 2

New Content Preparation (5-20 mins)
CLEAR EXPRESSION, TRANSFORMATION TO VOLUNTARY ATTENTION

Strategy

Clearly present objectives to shift to voluntary attention

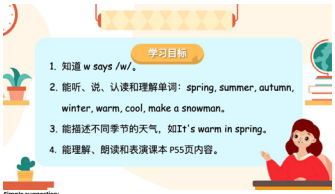
Clearly presenting learning objectives helps students build expectations of learning outcomes and motivates them to complete tasks, supporting the development of voluntary attention.

Design Methods & Application

To ensure clear communication, present information concisely and logically, avoiding redundant or irrelevant visual elements.

Combine the on-screen text with a simple, relevant graphic, and ensure the teacher verbally articulates the objective.

Avoid distraction
Over-decoration or off-topic graphics may distract students, reducing their focus and cognitive efficiency.



Simple suggestion:
State learning objectives in a list format.

Why

After initially capturing students' involuntary attention, it is crucial to transition it to "voluntary attention", which requires conscious effort.

Clearly stating the "what" and "why" of the lesson provides students with a purpose, which is a key factor in developing and sustaining this more focused, self-directed form of attention.

Stage 3

New Content Preparation (5-20 mins)

VISUAL ACCURACY TO SUPPORT INTERACTION

Strategy

Use accurate visuals and appropriate motion to support initial interactive activities

Activate students' prior knowledge or life experiences, often through interactive activities, to maintain voluntary attention.

Design Methods & Application

Graphic content should closely align with interactive activities to enhance teaching effectiveness and logical coherence.

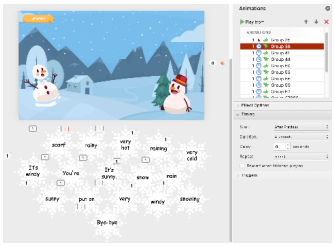
Visual design must ensure visual accuracy and cognitive compatibility
Visual elements must match students' cognitive experiences to avoid misunderstanding.

For example, a "bus" should look like the kind of bus students see in their city.

Motion effects should serve clear teaching purposes; avoid applying motion to purely decorative elements.

The speed of motion effects
The speed should match students' reading and response pace. For lower-grade students, motion speed should be slower. Effects that are too fast may prevent effective review. A single motion effect lasting ***3–5 seconds*** better fits lower-grade students' information processing pace.

Highlight suggestion:
Single motion effect lasting 3–5 seconds



Why

Activating prior knowledge is more effective when the visuals are cognitively compatible.

An inaccurate or unfamiliar visual representation (e.g., a bus that looks nothing like the local buses) creates cognitive dissonance, forcing students to spend effort reconciling the image with their existing knowledge, which increases cognitive load.

Stage 4

New Content Instruction (5-20 mins)

SIMPLIFYING EXPRESSION TO FOCUS ON CONTENT

Strategy

Reduce fluid expressions for new content instruction

Simplify motion graphics during the presentation of new knowledge to ensure the content itself is the sole focus.

Design Methods & Application

Employ minimalist layouts with high contrast and clear typography.

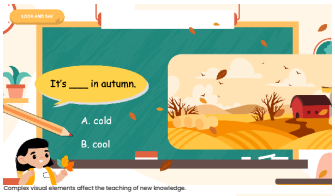
The visual design should be receded, ensuring that the new content is the most salient element on the screen.

Use "stillness" as a tool. After a motion sequence, allow for moments of visual calm for information processing.

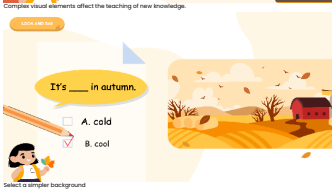
Set critical motion effects to trigger "On-Click" rather than automatically, giving the teacher control.

Static visual elements
A white background is recommended as it improves readability and creates strong contrast.

Motion effects
Limit effects to foundational types like "Appear," "Fade," or subtle positional shifts. Avoid complex or decorative motion.



Complex visual elements affect the teaching of new knowledge.



Select a simpler background

Simple suggestion:
Simplify the entire visual presentation during the new knowledge teaching phase.

Why

This is the peak attention phase for new content instruction. Students' "brain's RAM" is fully engaged in processing new information (intrinsic cognitive load).

According to **Cognitive Load Theory**, any flashy visual elements unrelated to the core content act like extra background programs, consuming valuable "RAM" (imposing extraneous cognitive load) and causing the main task (learning) to slow down or even freeze.

Stage 5

Practice and Interaction (20-30 mins)

ENHANCING INTERACTION TO MAINTAIN ATTENTION

Strategy

Support interactive activities to enhance voluntary attention

During the phase when students' attention naturally declines, use diverse, highly engaging interactive activities to sustain and reinforce their voluntary attention.

Design Methods & Application

Direct interest guidance
Use popular cartoon characters or familiar real-life contexts.
Note: characters should play a supporting role.

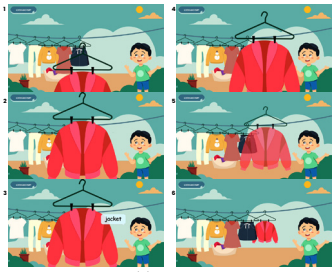
Indirect interest guidance
Integrate gamified elements such as competitions or points collection.

Interactive design
Select a limited number of 2-3 interaction forms per lesson, but vary their visual themes across different lessons to prevent monotony.

Provide immediate and unambiguous action feedback (e.g., a sparkle on a correct match).

Structure tasks to allow for voluntary control of motion effects, such as clicking a button to reveal an answer. Encourage students to physically interact with the smartboard.

Game design
Games are highly recommended for this stage. Their pace can be relatively fast to liven up the classroom.



Motion effects respond to student behaviour (1-6):
When clothing appears, students identify the clothing item. After the student speaks the name, a motion effect appears: "The clothing is hung on a rope."

Why

Students' attention spans naturally begin to decline after 20 minutes. At this point, the teaching focus shifts from "imparting new knowledge" to "maintaining engagement."

We need to combat fatigue by stimulating students' "interest," which comes in two forms:

Direct interest: Interest in the activity itself (e.g., favorite cartoon characters, fun games).

Indirect interest: Interest in the outcome of the activity (e.g., winning a competition, receiving praise from the teacher).

Effective interactive activities "reignite" students' motivation to learn by tapping into these two types of interest.

Stage 6

Output and Assessment (30-40 mins)

ALTERNATING FLEXIBLY FOR CONSOLIDATION AND RECOVERY

Strategy

Maintain two facets of attention

In the final phase of the lesson, when students' attention fluctuates, flexibly alternate between strategies of task guidance (voluntary attention) and sensory stimulation (involuntary attention) to support output and assessment.

Design Methods & Application

Motion graphics serve as tools for task guidance and attention elicitation.

Visual design should be more varied and flexible, task-oriented rather than decorative.

Interactive design should be varied and engaging to attract student participation.

Video clips or animations can be reused to re-engage students' attention (e.g., reviewing knowledge in a "Let's Watch Together" stage).
Recommended video length is at least **20 seconds** to help sustain attention.

Why

Towards the end of the lesson, students' "voluntary attention" resources are largely depleted.

However, a brief "attention rebound" often occurs just before the class ends. At this time, experienced teachers alternate strategies: they recapture involuntary attention with novel interactions or videos, and quickly guide this attention back to the task of consolidating knowledge, achieving an effective re-engagement.

Topic 2

Building a Learning Ecosystem:
CROSS-MEDIA VISUAL CONSISTENCY

Core Strategy

Ensure the visual language of the motion graphics is consistent with the physical textbook.

"Building a Cross-Media "Visual Grammar"

Students' learning is a unified experience that spans various media (screens, books, worksheets). When these media "speak the same visual language," it effectively reduces the cognitive confusion caused by shifting styles.

Coherence Principle

Consistent visual elements (characters, fonts, icons) build a crucial visual bridge between media. They convey an important message to students: "The content on the screen and the content in the book are part of the same lesson," thereby systematically reducing extraneous cognitive load.

Examples & Application

Character consistency, element extraction, innovation with inheritance.



Hardcover textbook

Simple suggestion:
The illustrations provided in the textbook can be used directly to enhance visual consistency.

Motion graphics

What to avoid
Designing a visual system that is completely detached from the textbook.

Topic 3

Situated Learning:
REPRESENTATIONAL MATCHING AND CULTURAL APPROPRIATENESS

Core Strategy

Construct specific, coherent simulated scenarios that are relevant to students' real-life experiences.

How to make abstract words "come alive"?

Situated Learning

Knowledge is better understood and mastered when it is closely linked to the context in which it is applied. An isolated word is an abstract symbol, but placing it in a specific life scene (e.g., learning "apple" in a "supermarket") should enhances its meaning and usability.

Cultural Appropriateness

Even if a scene is beautifully designed, its effectiveness diminishes if its content conflicts with students' life experiences. The unfamiliarity itself creates a cognitive distraction. An effective context should be one that students can understand and resonate with.

Examples & Application

Contextual coherence, authenticity, and localization.



A more comprehensive scenario presentation



Abstract, unrealistic scenario presentation

What to avoid
Providing incomplete contexts or scenes that are disconnected from students' lives.

Chapter: 2

SPECIFIC DESIGN DOMAIN GUIDELINES

In this part, we delve into the guiding principles for specific design elements. Each principle follows the

Strategy + Principle + Example

structure to ensure its actionability and interpretability.

Topic 4

Motion Effects Design:
PURPOSE AND CONTROL

Core Strategy

Motion effects must serve a teaching purpose, not be purely decorative; their speed must match the students' cognitive pace.

Why

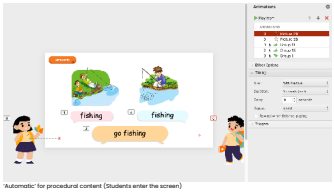
Unnecessary motion effects distract attention, whereas designed effects should guide the eye, explain processes, and provide feedback.

Students process information more slowly, and effects that are too fast can prevent them from seeing and understanding, leading to frustration.

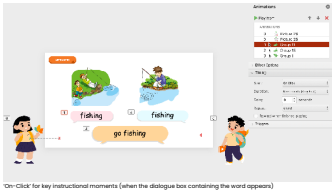
Suggested application

Use cases for motion
Highlighting key content, showing processes, providing feedback.

Trigger controls
Use "Automatic" for procedural content and "On-Click" for key instructional moments.



'Automatic' for procedural content (Students enter the screen)



'On-Click' for key instructional moments (when the dialogue box containing the word appears)

What to avoid
Animating purely decorative elements; setting all effects to play automatically

Topic 5

Visual Expression :
GRAPHICS, PHOTOS, AND INTUITIVENESS

Core Strategy

Use graphics primarily and photos supplementarily, switching strategically to ensure all visual expressions are clear, intuitive, and accurate.

Intuitiveness Principle

Students rely on intuitive thinking.

Visual design needs to convey information directly and clearly. Complex visual metaphors increase the difficulty of understanding.

Intuitiveness requirements
Ensure clear correspondence and avoid ambiguity

Representational Mode-Matching" Model

Graphics (Abstraction)
Suitable for actions and abstract concepts. They help students grasp the core features of something by simplifying details.

Photos (Contextualization)
Suitable for concrete objects and real scenes. They help students connect knowledge with real life through a direct link to the real world.

'To graphic' or 'To Photograph'?

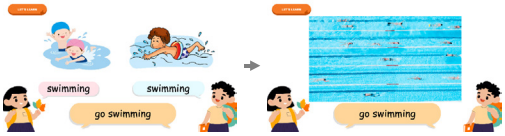
What to avoid
Disrupting cognitive continuity by overusing photos; using blurry or inaccurate images.

Suggested strategy

(1) Establish a real reference with a photo, then use a graphic for abstraction.



(2) Explain a rule with a graphic, then show its real-world application with a photo.



Topic 6

Text Design :
READABILITY AND CONSISTENCY

Core Strategy

Ensure text is clearly readable from anywhere in the classroom and systematically establish information priority through typography.

The "Signalling Principle" in Visual Grammar

Text design is not just about aesthetics; it is core to building a clear "reading path." By systematically applying contrasts in font size, colour, and spatial position, we send clear signals to students about "what is important" and "what to read first".

This guides their attention and reduces the cognitive resources wasted on searching for information.

Suggested application

Text Color
Use black on white backgrounds; use red for highlighting.

Font Selection
Prioritize fonts that match the textbook.

Text Size

Main body text: 32pt

Minimum size: 24pt

Suggested sizes for functional text:

Course title 36pt
Unit or
Chapter title 40pt

Section labels (for teachers only, who is close to the screen) 12pt

What to avoid
Using green text on screens; using inconsistent fonts

Topic 7

Colour Usage:
APPEAL AND CLARITY

Core Strategy

Use bright, highly saturated colours to attract students while maintaining a clear visual hierarchy through colour contrast.

Cross-Media Visual Grammar

'Coordination with the Physical Environment'

The perceived clarity of on-screen colours is directly affected by the physical environment.

For example, in a brightly lit classroom, some colours that appear high-contrast on a monitor (like a green background) may become blurry and harsh when projected.

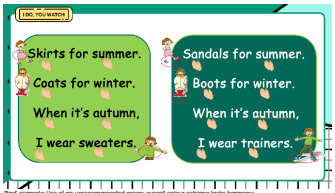
Therefore, colour selection must not only consider "on-screen design" but also treat the physical classroom as an extension of the design canvas to ensure the clarity and comfort of the final projected image.

What to avoid
Large areas of pure red; greenish tones that blend with blackboards; using similar colours for different information.

Suggested application

Colour preference
Lean towards high-saturation, high-value colours; cool tones (e.g., blues) are recommended.

Visual hierarchy
Use contrast to make key content stand out.



'Bad' example: Use of an unrecommended green; overall colour scheme lacks harmony; primary content fails to stand out.



'Good' example: Utilising "cool" tones, with overall tonal harmony and prominent main content.

Topic 8

Sound Design:
IMMERSION AND SUPPORT

Core Strategy

Strategically use sound to enhance immersion, support pronunciation input, and provide interactive feedback.

Why

The combination of auditory and visual input significantly enhances memory and comprehension. Personified voices (especially children's voices) increase emotional connection, while context-matching sound effects improve realism and engagement.

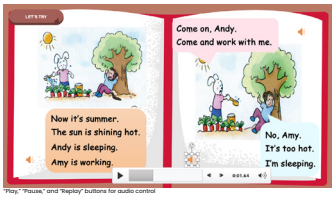
Suggested application

Voice-overs
Use real human voices (especially children's) for pronunciation.

Contextual sound effects
Add matching sound effects (e.g., "drip" for rain).

Interactive sounds
Add short sound cues for key actions in games.

Audio controls
Must provide "Play," "Pause," and "Replay" buttons.



"Play," "Pause," and "Replay" buttons for audio control

What to avoid

Unclear computer-generated voices; sound that cannot be controlled by the teacher.

Topic 9

Familiarity and Novelty:
BALANCING COGNITIVE LOAD AND LEARNING INTEREST

Core Strategy

Combine novel teaching content with familiar interactive formats, or pair novel interactive formats with mastered content, to dynamically balance students' cognitive load and learning interest.

'Stability for Function, Novelty for Content.'

Differentiated Familiarity Strategy

Leverage "Familiarity" for efficiency
For functional, operational design elements (like buttons and icons), high consistency and repetition are crucial. This allows students to develop "muscle memory," enabling them to operate without thinking and thus saving cognitive resources.

New Knowledge + Familiar Game
Mastered Knowledge + Novel Game

Leverage "Novelty" for motivation
For content-based, experiential design elements (like storylines and game mechanics), variation and novelty are key to maintaining student interest. Monotony quickly leads to boredom.

New Knowledge + Novel Game

What to avoid

Introducing a new knowledge point and a new game mechanic at the same time.

Chapter: 3

DELIVERY AND COLLABORATION

Topic 10

Designing for Teachers:
ENSURING FLEXIBILITY AND MODIFIABILITY

Core Strategy

Reserve "modifiable and operable space" during design and provide clear, concise modification instructions to empower teachers to make adjustments based on actual classroom situations.

Why

Teachers are the final implementers of instruction; they know their students' needs best. However, they are not design experts, and complex design tools can be a barrier. A design that cannot be easily adjusted by a teacher has diminished practical value.

Therefore, providing simple modification guides and flexible design templates is not an added service but a core requirement to ensure the design can "survive" and achieve its better potential in a real classroom.

Suggested application

Modifiable space
Make elements like text boxes and images easy to replace.

Clear annotations
Embed specific instructions in the "Notes" section of the slide.

Simplified operations
Use non-technical language in instructions.



Modification instructions in the "Notes" section of the slide

What to avoid

Locking all elements; providing overly complex modification instructions.

Designer
Quick-Reference Checklist

1. Core Strategic Principles

Checklist Item
Detailed Pointers & Metrics (Do's & Don'ts)

	Instruction Phase (5-20 min)	Practice/Interaction Phase (20-30 min)
DYNAMIC REGULATION: Efficiency vs. Motivation **Goal**: Match design intensity to the lesson stage. **Ask**: Is my primary goal right now to help students understand or to keep them engaged?	**DO:** Prioritize Cognitive Efficiency • **Layout**: Use minimalist layouts with ample white space. Prefer a plain white background. • **Visuals**: Use only essential, directly relevant graphics. • **Motion**: Use only basic effects ("Appear," "Fade"). Avoid anything decorative.	**DO:** Prioritize Learning Motivation. • **Visuals**: Use appealing visuals like popular characters (in support-ing roles) and familiar life contexts. • **Interaction**: Implement gamification (points, competition). Ensure interactions provide immediate feedback. **DON'T:** Overuse the same game format. Vary visual themes to maintain novelty.
CROSS-MEDIA CONSISTENCY **Goal**: Create a seamless learning ecosystem between screen and paper. **Ask**: If a student looks at my design and their textbook, do they feel like they are part of the same lesson?	**Characters & Key Visuals** **DO:** Extract and reuse characters, icons, and illustrations directly from the textbook. • **Check**: Are the character's appearance, clothing, and style identical? **DON'T:** Create new characters or styles that conflict with the established textbook visuals.	
SITUATED LEARNING **Goal**: Make abstract vocabulary concrete and meaningful. **Ask**: Is this scenario easily understandable and relatable for Grade 2 student in this specific region?	**Relevance & Authenticity** **DO:** Use contexts from students' daily lives (e.g., school, home, local park). Incorporate local cultural elements where appropriate. **DON'T:** Use abstract, generic, or culturally unfamiliar contexts without strong justification.	

2. Specific Design Domains

Checklist Item
Detailed Pointers & Metrics (Do's & Don'ts)

	Speed & Duration	Triggers
MOTION EFFECTS **Goal**: Use motion to guide, clarify, and provide feedback, not to decorate. **Ask**: What specific teaching purpose does this motion effect serve?	**DO:** Match the speed to learners' processing time. • **Metric**: Target 3–5 seconds for a single key motion effect. Slower for new concepts, slightly faster for reviews. **DON'T:** Use fast, "blink-and-you-miss-it" motion effects.	**DO:** Give control to the teacher for key moments. • **Use "On-Click" for**: Revealing answers, showing key vocabulary, prompting student responses. • **Use "Automatic" for**: Background setup, transitions, non-essential character entrances.
VISUAL EXPRESSION **Goal**: Choose the right visual tool (graphic vs. photo) for the cognitive task. **Ask**: Do I need to abstract a concept or contextualize it in reality?	**Graphics (Abstraction)** **Use for**: Actions (e.g., running, jumping), processes, rules, abstract ideas, character interactions. • **Benefit**: Reduces cognitive load by simplifying details. More appealing to learners.	**Photos (Contextualization)** **Use for**: Concrete, perceptible objects (e.g., apple, car), authentic real-world scenes, situations requiring high fidelity. • **Benefit**: Enhances semantic recognition and connects learning to the real world.
TEXT **Goal**: Ensure effortless readability and clear information hierarchy. **Ask**: Can a student in the back row read this text easily?	**Text Size** **Main Body**: 32pt. **Minimum acceptable**: 24pt. **Titles**: 36-40pt. **Subtitles/Prompts**: min 24pt.	**Text Colour** **DO:** Maximize contrast. Use black on white or white on dark backgrounds. • **Highlighting**: Use red or another single, high-contrast color sparingly to mark key words. **DON'T:** Use green text on screen (often appears blurry).

	Palette Choice	Environmental Check
COLOUR **Goal**: Use colour to attract, engage, and structure information. **Ask**: Is my colour choice helping students focus on the right thing, or is it just decorative noise?	**DO:** Use bright, high-saturation, high-value colours. Cool tones (blue-leaning) are generally well-received. **DON'T:** Create a visually overwhelming experience. Avoid large areas of pure red. Use fluorescent colours very sparingly.	**DO:** Consider the projection environment. • **Check**: Test colours on a projector in a lit room. Avoid greenish tones that conflict with classroom blackboards. responses.
SOUND **Goal**: Use sound to enhance immersion and provide clear auditory cues. **Ask**: Is this sound adding value, or could it be distracting?	**Voice-overs & Controls** **DO:** Use clear, naturally paced human voices (children's voices are a plus). • **Crucial Feature**: ***ALWAYS*** provide clear "Play/Pause/Replay" controls for any instructional audio.	
FAMILIARITY vs. NOVELTY **Goal**: Prevent both boredom and cognitive overload. **Ask**: Am I introducing too many new things at once?	**The Rule** **DO:** Pair new content with a familiar activity, OR a new activity with familiar content. **DON'T:** Introduce new, difficult content AND a new, complex interactive format in the same activity.	
MODIFIABILITY **Goal**: Empower teachers to adapt the materials. **Ask**: If a teacher wants to change a word or a picture, can they do it in under a minute without special training?	**Implementation** **DO:** Keep text and images as separate, editable objects. • **Instructions**: Provide short, action-oriented instructions directly in the slide's "Notes" section (e.g., "Right-click the image to change it").	

Teacher
Simplified Revision Guide

A Welcome to You, the Teacher!

This guide is designed for you. You are the expert on your students and your classroom. These motion graphic materials are powerful tools, and your ability to make personalized adjustments can make them even more effective.

This guide will show you how to easily modify the content to suit your teaching needs.

Make it Relevant for Your Students: You can change examples, names, or pictures to reflect your students' lives and local culture. This makes learning more meaningful and engaging for them.

Match Your Teaching Pace: Sometimes you may need to simplify a question or add an extra example. Easy modifications allow you to control the flow of the lesson to match your students' real-time understanding.

What Can You Easily Change in the motion graphics?

Text (Words and Sentences)
Images (Pictures and Photos)
Sound (If Applicable)

Three "Suggested Rules" for Effective Revisions

Rule #1: Keep it Simple & Clear

The main goal is to help students focus. When presenting new words or concepts, a simpler screen is always better.

Ask yourself: "Does this element help students learn, or could it be a distraction?"

DON'T: Add extra decorations, flashy motion effects, or images that are not related to the lesson.

Rule #2: Make it Relevant

Students learn better when they can connect new knowledge to their own world.

Ask yourself: "Is this picture or example something my students have seen or experienced in their lives?"

Example: If teaching about "seasons," a picture of a "snowman" is great for students in northern regions but might be confusing for students in tropical areas. Consider using a picture of a "typhoon" or "rainy season" instead.

Rule #3: Check for Consistency

The motion graphics should feel like a natural extension of the textbook, not something completely different.

Ask yourself: "Do the characters and important pictures in my modified slide still look like the ones in the textbook?"

DO: When you replace a picture, try to find one with a similar style to the textbook illustrations.

Appendix B

Teacher
Simplified Revision Guide

How to Do It? Look for Help in the "Notes" Section

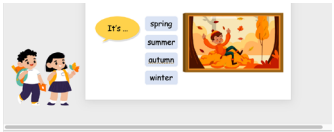
We have asked the designers to leave simple, step-by-step modification instructions for you directly in the "Notes" sectionof each slide. This is the area usually located below the main slide in your presentation software (like PowerPoint).

How it works:

1. Click on the slide you want to modify.

2. Look for the "Notes" section below it.

3. Follow the simple instructions, such as "You can change the text in this box" or "Right-click the picture to replace it."



Page Purpose:
To present a variety of typical seasonal images (e.g., clothing, nature, activities) and guide students to say: "It's spring/summer/autumn/winter." This activity is designed for practicing the vocabulary of the four seasons.

Operation Guide:
A student character appears automatically, followed by a speech bubble displaying "It's..." The seasonal word appears with an animation lasting approximately 2 seconds.

First Click: The option *autumn* shakes to prompt students to recognize and choose *autumn* based on the image.

Second Click: The image switches to a summer scene.
Modification instructions in the "Notes" section of the slide
Third Click: The option *summer* shakes.
The same pattern continues: the image changes, followed by the corresponding word shaking to draw attention.
After all images have been shown, clicking proceeds to the next slide.

Editing Instructions:
Double-click the text box to modify the displayed text directly.

We hope this guide helps you confidently adapt these materials for your classroom!

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Finally, I would like to dedicate this work to the memory of my beloved grandfather. I hope this achievement makes you proud.

Motion graphics as an educational tool that supports learning English vocabulary by Chinese students

2025

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