Moving Towards Flexible Ubiquitous Agnostic Design (FUAD) Framework from an Informed View of Lecturers' Practices

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July 2019.

This thesis is submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

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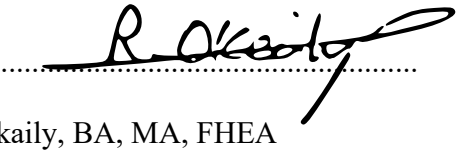
Signature .....  .....

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Abstract

This research addresses the need for change in higher education pedagogy due to developments in technology and the proliferation of digital devices. Three main directions are identified as having the potential of instigating an educational paradigm shift; flexible pedagogy (Ryan and Tilbury, 2013); ubiquitous learning (Cope and Kalantzis, 2010) and agnostic instructional design as represented in the practical set of strategies for creating device neutral assignments (DNA) (Campo, 2013). All three have been combined to formulate the Flexible Ubiquitous Agnostic Design (FUAD) framework for instructional design. The principles of the framework have been expanded and modified based on the findings of empirical data collection.

In this theory-driven evaluation research, FUAD was used to evaluate learning designs using the FUAD principles as evaluation criteria. Semi-structured interviews were conducted with lecturers to discuss learning experiences from a variety of universities in different countries. The purpose of the evaluation was twofold: assessing learning designs as well as informing the FUAD framework.

Findings are presented by providing example assignments for each FUAD principle. An additional category was added for technical and procedural assignments to show how they relate to the FUAD principles. Findings show that FUAD is a useful evaluation tool. It enabled the identification of successful elements as well as the diagnosis of problem areas in learning experiences. Through the use of the seven FUAD principles and the enablers

and inhibitors of each learning experience, suggestions were presented to develop assignments and to overcome problem areas. Inhibitors are discussed collectively as pointers to possible issues that can restrict the adoption of the FUAD framework.

The FUAD framework is significant because it supports agnostic and inclusive instructional design. It translates the theoretical concepts of new pedagogies into practical principles or procedures that could be incorporated into learning experiences. It functions as a framework for instructional design and as an evaluation tool for learning experiences in higher education.

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Acknowledgements

This journey was only possible through the support of many people I was fortunate enough to have in my path. I would like to express my heartfelt gratitude to each and every one of them for believing in me and cheering me on.

Deep gratitude goes to my supervisor, Prof. Don Passey, for his guidance, trust and motivation. His continued feedback and support throughout the process made all the difference. My gratitude extends to all members of the department of e-Research and Technology Enhanced Learning for enriching our journey and opening new horizons of knowledge.

I would like to express special thanks to the lecturers who agreed to be interviewed and shared their valuable experiences and insights with me.

My gratitude, appreciation and love to my parents are beyond any words or expressions. My father, Professor Aziz AlOkaily, has always been my role model and mentor; and my mother, Asima, has always been my inspiration and corner stone. Thank you for never letting me down. Zaid, Hussein, Muhamad, my wonderful boys, thank you for giving me the time and support and for putting up with me whenever submission deadlines loomed.

Finally, to the wise force that guided my vision and taught me to see things bigger than I could have on my own; to my husband, Dr. Ahmad Salih, thank you for teaching me to always look forward to a bigger, brighter goal.

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Chapter 1 Introduction

1.1. Research background

Most higher education (HE) institutions are looking for ways to increase technology integration into their programmes for various reasons, ranging from endeavours to improve educational practice to attempts of supporting competitive marketing policies. This move towards more Technology Enhanced Learning (TEL) has been noted to coincide with the move towards the globalisation, commodification and massification of HE (Jones, 2001; Teichler, 1998; Willmott, 1995) and the need to emulate the change from an industrial-based economy to a knowledge-based economy (Fung and Yuen, 2006).

Technology, institutionally obtained and controlled, has been noted to be an enabler of such massification in HE (Traxler and Lally, 2016) while still mostly maintaining the same tradition of the Socratic method of lectures (Bernard, 2019). Whether TEL is being implemented through a policy of central institutional control or a policy of Bring Your Own Device (BYOD), academic evidence towards usefulness of TEL has been mixed and the prospect of better, more empowering education is not necessarily evident yet (Bernard, 2019; Cochrane, 2012; Cope and Kalantzis 2010; Kirkwood, 2009).

The ubiquity and prevalence of digital devices have led to new realities for the learner and the learning process. Ubiquity in the context of this research means availability and mobility of computational devices (see section 2.2.2).

There are many noted changes in the learner. They operate a variety of devices, use different channels of communication such as instant messaging, SnapChat, email, WhatsApp, etc., access information through the Internet (Ebner, 2019), They tend to have short attention span (Ang, 2018), as well as increased expectations of instant access to information and to technology, along with impatience with passive forms of learning such as lectures (Waycott et al., 2010). The new reality of ubiquitous computing, i.e. computational devices being embedded in everyday life and readily available for use (Weiser, 1996), has led to the emergence of ubiquitous learning as a new educational paradigm more suited to the characteristics of the learners. Working in environments where access to technology is embedded, needs a shift in adopted pedagogy by moving away from passive learning, to a more active, social co-construction of knowledge. Chapter 2 provides further discussion on the concept of ubiquity.

Similarly, the Higher Education Academy (HEA) recognises the need for pedagogies that are more flexible to cater for today's learners (Ryan and Tilbury, 2013) and to be more compatible with the new digital era of knowledge sharing and the ideology of social learning (Des Bordes and Fredi, 2008). Such ideology is seen to be the result of increased device ownership among students which has markedly changed students' attitudes and preferences resulting in gaps between learners and current educational systems in HE (Bernard, 2019; Godwin-Jones, 2011; Stockwell, 2010; Traxler, 2012).

1.2. Problem statement

Calls for change in education and paradigm shifts in pedagogy have been abundant, with continuous reference to how the advent of technology has not yet instigated such change. Technology in the classroom does not necessarily cause educational change nor should it be an educational goal (Ertmer, 1999; Hamilton et al., 2016). In fact, it is how the technology is used and the approach to teaching and learning that does. Among the main reasons documented in the literature are those related to how new technology such as Learning Management Systems (LMS), smart boards, projectors, or access to the Internet are being put to use within old pedagogical designs (Abrahams, 2010; Angeli and Valanides, 2009); therefore, uses are not effecting the required pedagogical change. For example, LMS is being used as a reservoir for resources and lecture slides without any change in the lecture itself, or multi-media resources are used to transfer knowledge to the students in passive learning designs. Other reasons relate to lecturer resistance to change, lecturer lack of training or lack of digital competency, institutional lack of support, and institutional control that prevent or delay more progressive learning designs.

This research addresses an issue centrally concerned with the need for educational change, which is the way lecturers design learning experiences and how compatible it is with ubiquitous learning, flexible pedagogies and agnostic designs. The main issue here is the false expectation that technology integration can lead to educational change. Pedagogical change happens

when new pedagogies of active learning and learner-centred designs are applied to the teaching and learning process, including the use of technology. The focus needs to shift away from technology provision to instructional design that achieves the requirements of active, collaborative, social, flexible, and ubiquitous learning and empowers the learner with increased agency. The way to achieve this begins by first identifying new pedagogies, then by targeting the design of learning experiences to ensure such a change is happening on a micro level first.

Affecting change in HE starts with the lecturer who designs the learning experience. Spence (2001) duly notes that “We won’t meet the needs for more and better higher education until professors become designers of learning experiences and not teachers” (p.12). Therefore, in my view, the focus should shift from requiring technology to lead pedagogical change to addressing the traits required for it and incorporating them into the design of learning experiences.

1.3. Purpose

The purpose of this study is to create a tool in the form of a framework, that translates the theoretical concepts of new pedagogies into doable principles or procedures that can be incorporated into learning experiences; a tool that can function as a checklist of the required elements learners need to be more compatible with the real-world job market of the knowledge economy. Such a

tool can function as a framework for instructional design and as an evaluation tool for existing designs to help transform current practices.

The formulation of this framework was originally based on Device Neutral Assignments (DNA), which is a set of practical procedures to help teachers transform their lesson plans through the incorporation of technology. Ron Milliner gave a presentation on DNA in the Future of Education Conference (FETC) 2013 explaining ways teachers can transform their lesson plans and assignments to enable students to complete them on any device (Frosten, 2013). This was later further explained by Campo (2013) who listed six ideas for teachers to implement DNA. I personally implemented these six ideas in my own teaching (AlOkaily, 2013) and explained them further in additional documentation (AlOkaily, 2015a).

Upon further research, I found that two important theoretical concepts align with DNA strategies and can underpin and expand DNA. The first is the new pedagogical ideas for flexible learning (Ryan and Tilbury, 2013), and the second is the seven moves to ubiquitous learning (Cope and Kalantzis, 2010). By underpinning the DNA practical strategies with flexible learning pedagogies and ubiquitous learning ideas, it was possible to formulate the Flexible Ubiquitous Agnostic Design (FUAD) framework, which originally consisted of 6 principles, but was later expanded to seven principles based on empirical data.

The initial purpose of this research was to use existing knowledge to formulate the FUAD framework, then evaluate and improve it as an evaluation tool used to evaluate the practical action of instructional design. By using FUAD to evaluate learning experiences in HE, many insights have been gained, leading to expanding the original six principles as well as adding a seventh principle. Through FUAD, learning experiences have been analysed and improvement suggestions have been given to lecturers. Some of the lecturers chose to implement the suggestions and two of them ran a second iteration of their assignments and gave feedback to help improve FUAD as a tool.

1.4. Significance of the study

> "Theories, frameworks, or models can be seen as conceptual lenses through which to view the world. They help us in identifying objects worthy of attention in the phenomena that we are studying, highlighting relevant issues and ignoring irrelevant ones" (Mishra & Koehler, 2006; pp.1043-1044).

The FUAD framework is significant in that it translates theoretical concepts into doable principles that can be incorporated into the design of learning experiences. Additionally, it can be used as an evaluation tool to enable a systematic way of comparing the compatibility of a learning experience with new pedagogies through assessing the degree to which the seven principles of the framework exist in the learning experience. It targets the designs made by lecturers and provides elements to help the lecturer reflect and implement

particular ways of improving the learning experience to make it more compatible with flexible ubiquitous pedagogies.

A further important aspect of FUAD is the agnostic approach it has to technology. In this framework, technology is in the background, embedded, ubiquitous, varied and not focal. Designs are based on learning outcomes and the set of skills that learners need to develop, not on which technology to use or how to use it. The underlying assumption is that learners have access to technology; they have their own tools that they are used to and feel empowered by. However, lecturers should incorporate into the design ways to provide access to technology and to any underlying skills in case some learners need them to perform the task. In this way, a democratic approach (Des Bordes and Ferdi, 2008) is maintained through applying the seven principles of the framework.

The FUAD framework fills a gap in educational research, in that it provides an evaluation tool for researchers to evaluate instructional designs. Furthermore, FUAD addresses shortcomings of other popular frameworks for technology integration. Two examples are the Technological Pedagogical Content Knowledge (TPACK) framework (Mishra and Koehler, 2006) and the Substitution, Augmentation, Modification, Redefinition (SAMR) model (Puentedura, 2006).

In comparison to the TPACK framework, the FUAD framework targets particular aspects of the assignment itself in relation to the learning outcomes,

while the TPACK framework is used “to identify the nature of knowledge required by teachers for technology integration in their teaching” (Mishra and Koehler, 2006; p.1017). Therefore, identifying what lecturers need to know does not really specify what they need to do, whereas the FUAD framework articulates what needs to be done within the learning experience. Moreover, TPACK keeps technology at the forefront of the design, while technology lies at the background of FUAD where the onus of technology use lies on the students, but with ample support built into the learning design. Marcovitz and Janiszewski (2015) describe TPACK as a teacher-focused model, but critique that it does not evaluate the kind of learning that takes place.

The FUAD framework is equally different from the SAMR model (Puentedura, 2006). This is because the SAMR model describes the levels of technology integration, the lowest of which is the substitution level, moving on to augmentation, followed by modification, reaching the highest level of redefinition where technology is used to redefine the task. However, the SAMR model does not specify what is needed to reach the redefinition level. Although popular among practitioners, there are a number of criticisms for this model. Hamilton et al. (2016) list the following points of critique. First and foremost, it is neither based on research nor is it peer-evaluated and there is no clear description of each level; in addition to that, it does not take context into consideration because it is set as a taxonomy of rigid hierarchical structures; and finally it focuses on the product of the learning experience, not on the process or the underlying skills.

The DNA strategies (Campo, 2013; Milliner, 2013) which form the seed for FUAD is equally not research based. However, the FUAD framework is the result of research and theoretical underpinning of DNA strategies, as well as the verification of the framework through two expert reviews (see Chapter 3). FUAD is a set of principles that acknowledges what effect context has on the integration of each principle into the learning experience (Chapter 6) and it does not focus on the product, but includes a discussion of the assignment product as one of many other elements (section 3.1. FUAD principle 1: allowing choice of product, tools and procedure).

1.5. Immediate context and research motivation

In the United Arab Emirates (UAE), there has been an ongoing move towards smart learning as defined by the Muhamad Bin Rashid Smart Learning Program for schools (smartlearning.gov.ae), which came hand-in-hand with the iPad initiative for the tertiary level in government universities (Cavanaugh et al., 2013; Gitsaki et al., 2013; Khan et al., 2015). The initiative is also known as 'iPadagogy' with the purpose of creating a paperless educational environment (McGinley, 2012). At the same time, other semi-government and private universities have implemented different varieties of BYOD policy to enable technology integration and to keep up with the trend (AlOkaily, 2015b). However, both options have their distinctive issues. The iPad initiative achieves equity between students but has issues of institutional control that potentially limits students' experiences and contradicts principles of flexible pedagogy, as well as being an expensive option of TEL. The BYOD option

offers ways to overcome the limitations of the iPad initiative but has limitations of its own in terms of the consumerisation of information technology (IT) (Converge, 2012), which leads to issues of learner equity and inclusion.

Although the UAE is not the overall context of this study, it is the immediate context from which interest in the area of agnostic TEL design started. Having worked in three different universities in the UAE, I attempted designing TEL experiences for my students in different settings and found my way around different barriers. TEL designed-activities was only possible through a DNA strategy. The first university was a private university with very limited technology provision for students, which led to TEL being limited to interactive Compact Disk Read-Only Memory (CD-ROMs) that students could use in a computer laboratory. The second was a semi-government, non-profit university characterised by a mainly local student body. Designing TEL was somewhat easier because I adopted a BYOD policy in my classroom and designed lessons for students through adopting DNA strategies (AlOkaily, 2015b; AlOkaily, 2014; AlOkaily, 2019). However, students' culture was identified as a barrier (AlOkaily, 2016). The third was an off-shore UK university with an international student body. One restriction to adopting new pedagogies was student numbers, more specifically, lectures with a large number of students; however, I designed an agnostic intervention that provided a reasonable solution (AlOkaily, 2017), but the more serious restriction was institutional rigidity in terms of changing the design of summative assignments and the amount of approvals required before change is implemented.

At the same time, colleagues who were in government universities often complained about how they were limited by iPads and applications that are compatible with the operating system for iPads (iOS) and how some TEL designs were contrived because faculty were under pressure to build their lessons around the iPads. Mullen (2014) investigated in her PhD thesis the iPad initiative in the UAE and mentioned that faculty identified four main challenges. First, iPads can be distracting due to gaming apps or due to technical difficulties. Second, the exclusive use of iPads was limiting creativity in teaching and learning practices. Third, faculty felt overwhelmed with the variety of apps and tended to design for the app rather than for learning. Finally, faculty agreed that the iPad was not suitable for summative assessment.

Based on the previously mentioned experiences in different places within the UAE, adopting an agnostic approach to technology through BYOD policy proved useful and enabling of a new pedagogy. It also highlighted restrictions or barriers to implementing new pedagogy, such as cultural restrictions or institutional ones. That was the main reason I sought to do further research, trying to underpin the principles of DNA with theory to see how it fits with new pedagogical trends and how it relates to or addresses the identified restrictions. I also sought to investigate instructional designs in different contexts in an attempt to identify enablers and inhibitors.

1.6. The larger context

In his article ‘The Case Against Teaching’, Spence (2001) described how education has not evolved, saying that “a 15th century teacher from the University of Paris would feel right at home in a Berkeley classroom” (pp.12–13). This quote puts a spotlight on how HE is often quite the same, even if you are from a different country, and a different century. Therefore, I felt that it was important to take a wider look at learning experiences from different contexts because the call for shifts towards new pedagogies and change is not restricted to any particular context. The investigation and evaluation of learning experiences was sought from different international contexts. The chosen assignments were taken from HE institutions in four different countries, namely, the UAE, Egypt, United Kingdom (UK) and Canada, from different disciplines and specialisations, different levels of study ranging from tertiary to final year of undergraduate study, as well as Master’s degree assignment and Post Graduate Certificate degree assignment. The variety can only (and actually did) highlight the similarity in the perspectives of lecturers and how they view students’ abilities when designing learning experiences. It became clear that the determining factor was not relevant to context, rather it was relevant to - among other things - the lecturer’s digital agency (Passey et al., 2018).

1.7. Research questions

The aim of this research is twofold. The first aim is to develop, prove and improve a framework for flexible, ubiquitous agnostic design (FUAD) for learning experiences. The resulting FUAD framework is based on the practical strategies for implementing Device Neutral Assignments (Campo, 2013; Milliner, 2013) which are compatible with and can be underpinned by flexible pedagogy (Ryan and Tilbury, 2013) and ubiquitous learning (Cope and Kalantzis, 2010). The second aim is to evaluate current TEL designs of assignments and assessments against the FUAD principles as evaluation categories. The notions that are being problematised here are those of institutional control of technology, inclusivity and equity.

By developing the framework for design principles and evaluating different TEL experiences that lecturers have designed for their students, four research questions are to be addressed.

1. How can the new pedagogies of flexible learning (Ryan and Tilbury, 2013) and ubiquitous learning (Cope and Kalantzis, 2010) underpin the strategies of Device Neutral Assignments (Campo, 2013; Milliner, 2013) to form a framework for Flexible Ubiquitous Agnostic Design (FUAD)?

2. How compatible is the learning experience under study with the FUAD Framework?

3. How can the TEL experience under study inform and further develop the FUAD Framework?

4. What are the limitations of achieving FUAD-compatible learning experience?

The formation of the framework will be established from the literature and will be detailed and presented as a conceptual framework for this research. Compatibility of the TEL experience with the FUAD framework is to be evaluated by collecting evidence relevant to the principles of the framework. The interview questions (Chapter 4) will tackle these principles, and so will the document analysis. The framework will continue to be shaped by the information from the empirical data collection in a dynamic type of development where theory feeds into practice and practice feeds into theory.

1.8. Overview of the thesis

This thesis has been divided into six chapters. After this first introductory chapter, the second chapter is a literature review of the main concepts which form the conceptual framework of the research. Chapter 2 reviews the literature on the need for change in HE; it points to two new educational paradigms which are flexible pedagogy and ubiquitous learning. Then the review moves to the contrast between prescribed technology integration and BYOD policy. Finally, the chapter sheds light on device neutral assignments.

The third chapter is the conceptual framework for the study. It explains how the FUAD framework is in fact the strategies of DNA, each underpinned by the new pedagogical ideas of flexible learning and ubiquitous learning. It also explains how principles were modified and expanded based on early findings from the empirical data collection.

The fourth and fifth chapters explain the research design and the findings for this evaluation research. Chapter four starts with the philosophical underpinnings and moves on to the design of the evaluation research. Chapter five explains the findings by showing example assignments for each FUAD principle. It also adds an additional category of technical and procedural assignments to show how they relate to the FUAD principles.

Chapter six is the discussion and conclusion chapter. In it, a bird's eye view of the findings is presented. Each of the FUAD principles is discussed across assignments. Moreover, the theme of culture is also discussed as it was represented in some assignments. Similarly, the inhibitors are discussed collectively as pointers to possible issues that can restrict the adoption of the FUAD framework. The chapter concludes with limitations and recommendations for future research as well as final thoughts.

In this study, the term 'learning experiences' will be used to refer to any assignment, assessment, project, coursework, homework or set of tasks that lecturers design for students. Similarly, the term TEL experiences will be used

to refer to learning experiences where technology is used to aid the process of teaching and learning.

The reference to inclusivity in this research is mainly relevant to the idea of learners having equal access to technology and to skills support. However, accessibility issues extend beyond that to learners with disabilities (physical or mental) and the accessibility challenges they face in terms of digital content (Burgstahler, 2002; Seale, 2006). Learner disability is acknowledged as an important element in instructional design, but is beyond the current scope of this research.

Chapter 2 Literature Review

The literature review in this chapter is more eclectic and organic in nature in that it is not a systematic review of one idea, but rather, it is a review of selective literature (as discussed by Cronin, Ryan and Coughlan, 2008; Rhoades, 2011) on a number of constructs that together form a base for the argument that underpins the FUAD framework. A selective type of literature review is helpful in developing conceptual or theoretical frameworks (Coughlan et al., 2007; Merriam and Simpson, 2000) which can function as a guide for a study (Conkin Dale, 2005). Rhoades (2011) points that the reviewer engages in a "broad, qualitative, well-stated (but critical), and accurate evaluation of selected studies" (p. 355), explaining that in this type of review reasonable judgements are then made based on the reviewer's personal expertise. The choice of literature to frame this thesis was based on the main themes that underpin Device Neutral Assignment strategies (Campo, 2013) and provides background for why such neutrality is needed. First, the need for change in HE is reviewed, then two educational paradigms - flexible learning and ubiquitous learning - are reviewed as possible ways to lead change in HE. A comparison between prescribed technology integration versus BYOD policy is critically discussed to lay the ground for agnostic learning designs such as the proposed FUAD framework.

A current push and pull between old and new pedagogy tends to characterise many TEL implementations in HE. Amongst the variety of HE policies, educators often find themselves facing the challenge of integrating TEL and adopting new pedagogy in an institutional set-up designed for the old. HE

conventions of highly-prescribed teaching, learning and assessment can contradict students' realities of anytime, anywhere, highly personalised (Stockwell, 2010; Traxler, 2010) yet socially connected lifestyles (Liu and Milard, 2010; Des Bordes and Fredi, 2008). This contradiction mainly arises from the development and increased ubiquity of technology which HE institutions are trying to harness. However, instead of harnessing technology to enable a paradigm shift in education, it is sometimes being used to wield more control and authority over education in a way that limits some aspects of learner agency and personalised learning preferences.

The HEA suggests seven new pedagogical ideas for transformative learning that shift the focus from knowledge transfer to learner agency and competence (Ryan and Tilbury, 2013). Ubiquitous computing and the affordances of technology can be enablers of a new educational paradigm of ubiquitous knowledge construction (Cope and Kalantzis, 2010). Passey (2014) argues that technology has the potential of enhancing learning by making it more personalised but only when a match can be made between the learning approach, learning theories, learning outcomes and the technological affordances. Institutional control, along with the over-prescription of academic practice, is seen here as an inhibitor of any such paradigm shifts.

It is worthwhile introducing a definition of 'practice' here, since it is an important concept in this study. Reckwitz (2002) defines practice as follows:

> A 'practice' (Praktik) is a routinized type of behaviour which consists of several elements, interconnected to one another:

> forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge… [A] practice represents a pattern which can be filled out with a multitude of single and often unique actions reproducing the practice… the single individual – as a bodily and mental agent – then acts as the 'carrier' of a practice – and, in fact, of many different practices which need not be coordinated with one another. (Reckwitz, 2002: 249–50,as cited in Saunders, 2012)

The required paradigm shift in practice, with the latter (practice) identified in this study as a change in the patterns of action in HE teaching, is the main goal of the FUAD as well as a central contributer to the 'use' of evaluation research (see sections 4.1.3. and 4.2).

2.1. The need for change in HE

With the increased globalisation of HE and the increasing pervasiveness and ubiquity of digital technology, learners' realities and expectations have changed considerably enough to cause a discord or a mismatch with long-established HE realities. Kukulska-Hulme (2010) explains that this discord could possibly be the result of the incongruity between students' use of new technologies in their everyday life and the technology supplied and used by tutors and institutions to reinforce traditional HE practices 'causing a mismatch between the expectations of academic staff and the study habits of learners'

(p.7) which calls for more flexibility (Bates, 2001). Pachler, Cook and Bachmair (2010) question the value of our current educational system in the age of 'societally valorised learning' where consumption and production norms have changed through the changing landscape of media in terms of participation, distribution, local and global content, ubiquity and multimodality. New learner habits and preferences include studying whenever and wherever they find the time, and the interest, to do so, particularly if they have other commitments and preferably using their own technology (Johnson, Adams and Cummins, 2012). It is now possible for HE to increasingly meet such challenges through the use of technology to increase flexibility and meet the needs of students (Palmer and Devitt, 2008, 2014; Bates, 2001) as well as achieve deeper student engagement and personalisation (Johnson, Adams and Cummins, 2012).

However, it is often the case that old pedagogies are immediately mapped onto whatever new technology is being used. An example of that is the use of a learning management system (LMS) to do old things in old ways (Cope and Kalantzis, 2010). In many cases, we can still see the traditional lecture class setup where the main use of the LMS is to upload the learning content online to serve as a reference (Blin and Munro, 2008) instead of systematically expanding options of learning activities, resources and support (Boer and Collis, 2005).

In a report for the HEA, Ryan and Tilbury (2013) acknowledge these changes but warn that "pedagogical dimensions are easily obscured by technological 'mist'" (p.4) arguing that although the pedagogical change needed for HE is

instigated by the widespread adoption of new technologies in teaching and learning, this change is one that goes beyond students' preferences and curriculum delivery modes. Many researchers agree that although technology is an important enabler of educational change, it is not the crucial factor (Wanner and Palmer, 2015; Gordon, 2014; Keamy, Nicholas, Mahar and Herrick, 2007). Martin (2018) explains that focusing on the use of latest technology instead of on accommodating learning approaches and expanding student skills maintains the same old pedagogy but with more expensive tools. She continues to explain that the change does not instigate from the use of new tools to access information, but from the design of learning experiences that create opportunities for students to develop metacognitive capabilities.

This situation has spawned calls for an educational paradigm shift with more focus on active social knowledge construction rather than individual knowledge acquisition (Liu and Milard, 2010), the kind of shift suitable for what Kalantzis and Cope (2010) refer to as 'an emerging knowledge society'. Both Stockwell (2010) and Traxler (2010) opine that the relationship between learning and society is being transformed by the way learners personalise their own devices. Learners are using their devices to interact with their surroundings, sharing experiences and learning from each, in a way that goes beyond prescribed curricula (Liu and Milard, 2010). Des Bordes and Ferdi (2008) add that knowledge is shared socially in an age of collaboration, enabled by technology as its means of access, and illustrate an ideology of social learning. Moreover, the relationship between user and device is changing, creating a more personal, even intimate, connection between the device and its owner (Godwin-Jones, 2011; Traxler and Koole, 2014).

Students, empowered by mobile technology and wireless connectivity, tend to see the world as free of the restrictions of time and space. Universities, however, can be time and space bound. This discordance needs to change. Through hand-held digital devices, the long-held perception of time and space has changed. Learning takes place in ‘time pockets’ and study spaces have been expanded and augmented (Kukulska-Hulme, 2012) giving students choices of when and where to learn. Learners make conscious choices of how much time to invest, when and where. It is that same choice that makes institutions seem restricting because within the confines of the time and space of the lecture, students are exercising that choice by sometimes choosing to do something other than learning. Traxler (2012) explains that universities and lecturers are no longer seen as gatekeepers of knowledge and that learners are exercising choice and control at a personal level and constructing their own libraries and their own ‘worlds of knowledge’ (p.9).

Another type of shift brought about by the proliferation of mobile devices is one that relates to the instructional method and the design of learning experiences. Martin (2018) stresses that the power of the teacher comes from how he or she designs learning experiences to fit the character traits and learning habits of today’s learner. McKnight et al. (2016) describe the need for a learner-centred instructional method that allows learners choice, control, personalisation and different representations of learning pathways. On a more specific note, the design of learning experiences such as assignments and projects needs to shift the attention from an over-prescribed format to employing any meaningful representation of learning outcomes in order to increase students’ choice to use their own personalised tools and to be

innovative (AlOkaily, 2015b). This shift can be achieved by carefully wording the rubric of the assignment to allow for different types of output beyond the text and preferably with an array of different multimedia outputs that can be shared socially. Middleton (2015) reiterates the same principle, stating that students indicated inability to use their tablet computers in producing assignments because they could not produce 'proper' assignment format. He then suggests that maybe it is time to rethink what 'proper' is and allow for assignment formats that utilise digital tools and social media. Rethinking what 'proper' is, should lead to a shift in assessment methods and success criteria to accommodate that. Within the same context, Traxler and Vosloo (2014) point to how researchers such as Wagner and Ally have been questioning the nature of success and the predictors of success in education.

Hence, it can be said that the need for change is increasingly evident and that it is both instigated by the developments in technology and also enabled by the same. The next step is to identify which pedagogical changes have the potential to bridge the gap between HE and learners. The following section presents two educational paradigms: flexible pedagogy and ubiquitous learning, with the view that one leads to or is enabled by the other.

2.2. New educational paradigms

Two educational paradigms relevant to this study are flexible pedagogy and ubiquitous learning. These paradigms are identified as representing the type of pedagogies that HE could be shifting to, in order to bridge the gap between HE and today's learners. Each paradigm will be reviewed in general, with the

main focus being on the six pedagogical ideas for flexible learning (Ryan and Tilbury, 2013) and Cope and Kalantzis's (2010) seven moves to ubiquitous learning.

2.2.1. Flexible pedagogy

Flexible learning as a concept started to gain grounds at the time when there was increase and diversity of a student body and the spread of correspondence learning and distance learning. There was a need to provide other choices for students who were unable to commit to the traditional route of study. The flexible choices were mainly offered in terms of time and space, but not much beyond that. In the mid-1990s, research on flexible learning emphasised the crucial role of technology as an enabler of flexibility and sought ways to increase it beyond time and space (Boer and Collis, 2005; Ling et al., 2001; Collis, Vingerhoets and Moonen, 1997; Steeples, Goodyear, and Mellar, 1994). In 1993, Van Den Brande discussed in his book *Flexible and Distance Learning* how technology had enabled more flexibility and increased choices for different types of learners in different settings using different media representations (Van Den Brande, 1993).

Definitions of flexible learning indicate that flexibility goes beyond time and space. HEA definitions are based on offering more choice in terms of *pace*, *place* and *mode,* though Hammersley, Tallantyre and Cornu (2013) assert that flexibility of *content* is also essential, while Wanner and Palmer (2015) stress the importance of giving students choice and voice, and increasing the flexibility and personalisation of assessment. In terms of study programme

types, the range of flexible study modes goes beyond full-time, part-time programmes and includes study modes such as online programmes, blended learning, work-based training and accelerated programmes, as well as the flexibility in credit transfer from one institution to another (Hammersley, Tallantyre and Cornu, 2013).

In an attempt to take flexibility beyond time and space, Collis, Vingerhoets and Moonen (1997) conducted a research study in the mid-1990s and identified five main areas of course flexibility: flexibility in terms of time; content; entry requirement; instructional approach; and delivery and relevant logistics. This study was continued by Boer and Collis (2005) where they distinguish between *planning-type flexibility* and *interpersonal flexibility*. The *planning-type* is managed by instructors before and during the course and is relevant to time and space logistics, while *interpersonal flexibility* is more relevant to pedagogic decisions that impact learner experiences such as inviting learners to contribute to the content and assessment of the course and to interact socially to produce, or co-construct, knowledge (Boer and Collis, 2005). The authors identify interpersonal flexibility as the one that impacts pedagogy and results in educational change.

In response to current demands to increase flexibility in HE, the HEA initiated a multi-strand project titled *Flexible Pedagogies: Preparing for the Future* (heacademy.ac.uk). The project addresses four major areas of flexibility, namely: new pedagogical ideas (Ryan and Tilbury, 2013); technology-enhanced learning (Gordon, 2014); part-time learners (McLinden, 2013); and employer engagement and work-based learning (Kettle, 2013). Barnett (2014)

explains in his overarching report of the project that the ultimate aim of flexibility is the flexible graduate, who is capable of interacting with an uncertain and complex economy, and therefore needs curricula and assessments that show epistemic flexibility to help learners acquire new and open-ended ways of knowing.

Gordon (2014), in his HEA report *Flexible pedagogies: Technology-enhanced learning,* sums up the opportunities and the challenges of Flexible Pedagogy through TEL. He asserts that complete flexibility is impractical for many reasons and suggests increased flexibility instead of complete flexibility. He also identifies the three main stakeholders - learners, lecturers, and institutions - suggesting how each can benefit from and contribute to increase the flexibility of learning. The proposed framework for flexible learning (FL) (Figure 2.1) explains how the main principles interact and provides a lens to evaluate how flexible an institution is.

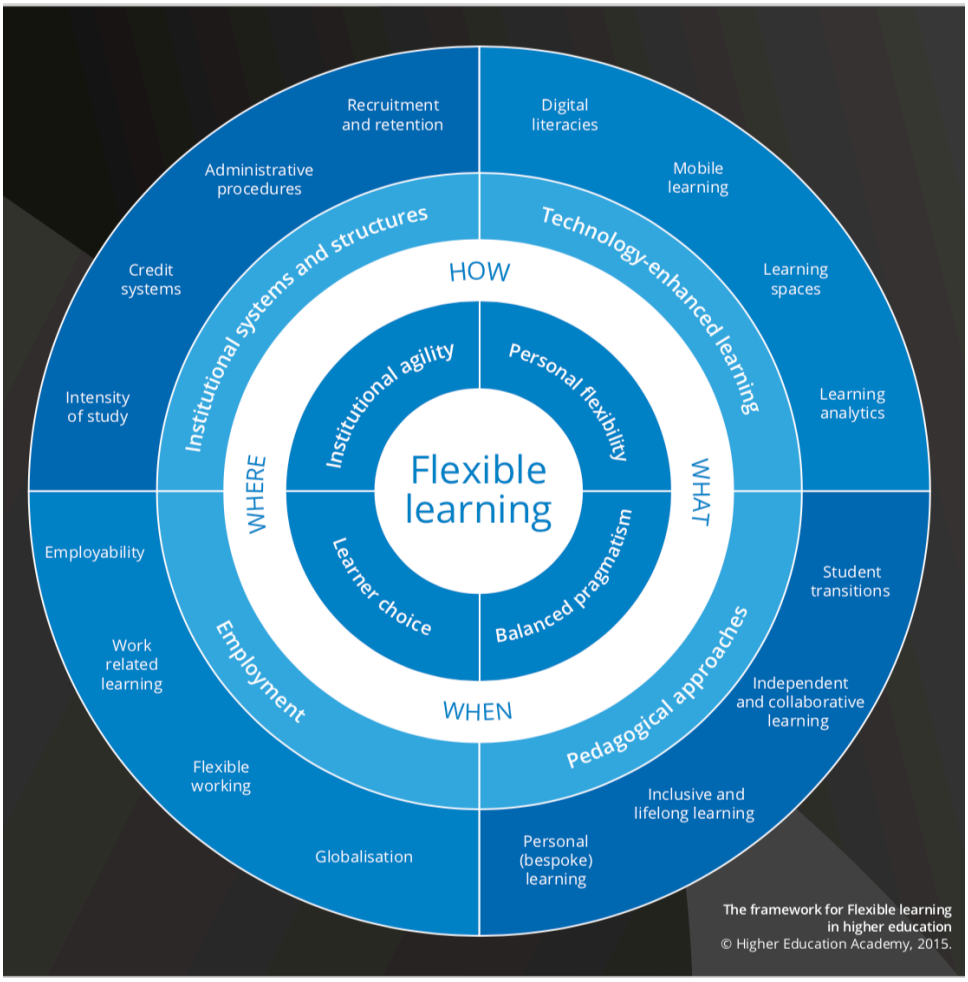


Figure 2.1. The framework for flexible learning in higher education

In Figure 2.1, flexible learning is at the core of the framework and is comprised of four main principles that help make education more accessible to increased numbers of highly diversified student cohorts (Higher Education Academy Consultancy, 2015). In Figure 2.1, personal flexibility and learner choice relate to the learner, while institutional agility and pedagogic approaches relate to the institution. This shows how flexibility is a shared responsibility and emphasises the partnership balance of power between learner and institution. The next

circle in the framework shows the ‘how’, ‘when’, ‘where’, and ‘what’ to represent the choices of space, pace and mode that are at the core of what flexible leaning is. This ring is not divided, because of the overlap of how these elements interact. The fourth outward ring specifies the four areas of focus which are TEL, pedagogical approaches, institutional systems and structure, and employability, with each area explained further in the final ring through examples of contributing components that enhance or hinder flexibility in that area.

Despite the many benefits, it is equally important to recognise the challenges of increased flexibility. Barnett (2014) warns that it is important for HE institutions to exhibit the right amount of flexibility because “*Too little flexibility* and systems will lack the capacities adequately to respond to a changing environment and, ultimately, will start to wilt. *Too much flexibility*, on the other hand, and systems will lack internal integrity and ultimately might fragment; certainly, they will run risks of lowering standards and failing quality measures” (p.7, italics in original source). In addition to that, flexible learning may be perceived negatively by academic staff for a number of reasons. Hammersley, Tallantyre and Cornu (2013) sum the reasons for such negative perceptions to the tendency of academic staff to think it would change their roles or affect their authority; also, workplace learning is viewed as vocational and of lesser quality than academic education. Another problem outlined by Hammersley et al. is that some academics refrain from increased use of technology either due to lack of time, lack of digital literacies and lack of training programmes, as well as a general caution that increased technology use may lead to a shift in focus to tools and devices instead of learning.

The HEA proposes six new pedagogical ideas that together comprise ‘flexible pedagogies’ (Ryan and Tilbury, 2013) and form one of the three components of the conceptual framework for this research. In their report, the authors argue that the widespread technology use in teaching and learning along with increasing diversity of learners ‘has triggered developments to extend flexible learning at several levels’ (p.4). However, technology can easily obscure such developments by keeping the focus on technology rather than on pedagogy, when in fact it needs to focus on how HE can fulfil societal needs.

The six new pedagogies are:

- **learner empowerment** – actively involving students in learning development and processes of ‘co-creation’ that challenge learning relationships and the power frames that underpin them, as part of the revitalisation of the academic project itself;

- **future-facing education** – refocusing learning towards engagement and change processes that help people to consider prospects and hopes for the future across the globe and to anticipate, rethink and work towards alternative and preferred future scenarios;

- **decolonising education** – deconstructing dominant pedagogical frames that promote only Western worldviews, to create experiences that extend inter-

cultural understanding in the HE system and the ability to think and work using globally-sensitive frames and methods;

- **transformative capabilities** – creating an educational focus beyond an emphasis solely on knowledge and understanding, towards agency and competence, using pedagogies guided by engaged, 'whole-person' and transformative approaches to learning;

- **crossing boundaries** – taking an integrative and systemic approach to pedagogy in HE, to generate inter-disciplinary, inter-professional and cross-sectoral learning, to maximise collaboration and shared perspectives, while tackling bias and differences of perspective;

- **social learning** – developing cultures and environments for learning that harness the emancipatory power of spaces and interactions outside the formal curriculum, particularly through the use of new technologies and co-curricular activities.

(Ryan and Tilbury, 2013; p.5)

These new pedagogical ideas are, to a large extent, in line with the underlying principles of ubiquitous learning as a new educational paradigm.

2.2.2. Ubiquitous learning

The concept of ubiquitous computing was first coined in the late 1980s by Mark Weiser who envisioned that computers would move to the background of everyday life and would be readily available for use without necessarily being physically apparent (Weiser, 1996). This describes, to a large extent, a modern-day reality in many places, where computers are now embedded in telephones, music players, gaming consoles, tablets, watches, eye glasses, home appliances and even fabrics. Due to the fact that these computers promise high potential for learning through ubiquitous access to knowledge, the term 'ubiquitous' has been appropriated by educationists (Barbosa, Hahn, Barbosa and Geyer, 2008; Lewis et al., 2010; Ogata, Matsuka, Bishouty and Yano, 2009; Ogata, Yin, Bishouty, and Yano, 2010; Rogers et al., 2005; Yin et al., 2004, 2010) with the argument that ubiquitous computing has the potential to lead to ubiquitous learning that should result in a shift in educational paradigms. However, this has not happened yet (Cope and Kalantzis, 2010). It would be worth investigating how technology can help achieve this paradigm shift and what, if any, elements may be obstructing this shift.

To start with, ubiquitous learning has a number of definitions, all relating to the availability and mobility of computational devices at all times and the potential of having them integrated within the learning process (Hwang, Tsai and Yang 2008; Kinshuk and Graf, 2012; Ogata, Matsuka, Bishouty and Yano, 2009). Cope and Kalantzis (2010) explain the concept as "a new educational paradigm made possible in part by the affordances of digital media" (p.576). However, the reference here is to ubiquitous computing in education which

can be seen as an equivalent to ubiquitous learning. Ogata and Yano (2004) define Computer Supported Ubiquitous Learning (CSUL) “as a ubiquitous learning environment that is supported by embedded and invisible computers in everyday life” (p.28) and add that it differs from computer assisted learning in that the learner is capable of physically moving their learning environment with them. This is where ubiquitous learning is linked to mobile learning and mobile learning is described as ubiquitous learning (Hwang and Tsai, 2011; Park, 2001; Sharples, Taylor and Vavoula, 2005). Emphases on learning everywhere and all the time are also evident in many other definitions (Hwang, Tsai and Yang, 2008; Shih, Chu, Hwang, and Kinshuk, 2011). Kinshuk and Graf (2012) describe it as omnipresent learning where learners’ portable devices provide virtual, electronic knowledge through device interaction with the environment surrounding the learner. However, Bomsdorf (2005) explains that ubiquitous learning means being able to access knowledge through computing devices ‘at the right time, at the right place, and in the right form’ along with seamlessly combining the virtual and the physical environments (p.1). The dynamic modelling of the learners, location, technology and context helps in augmenting the environment with virtual information based on a learner’s own goals, interests, competencies, cognitive characteristics and the location of learning (Kinshuk and Graf, 2012).

Some researchers describe how a ubiquitous learning environment can be achieved. Cheng et al. (2005) identify four steps. These are setting personalised instructional goals, sensing learning behaviours, checking compatibility between learning behaviours and instructional provision, and providing personalised support. This is enabled through the ‘six senses' of

mobile devices which are: (1) global positioning; (2) networking; (3) local content and context awareness; (4) relevant services; (5) enhancing surroundings with information; and (6) detecting learning interests (Dede, 2011). The ultimate goal of this type of learning is to have learners provided with information at a certain time and place through the interaction of their own devices with devices embedded in the environment in a seamless and natural manner without any explicit action on the part of the learner to initiate the learning (Kinshuk and Graf, 2012; Cheng et al., 2005).

Whether this goal is realistically achievable or not and whether it is actually beneficial for education and the learner, remains a point of debate. Perrotta (2012) describes this as a technology-inspired vision of a techno-utopian future based on the assumption that 'all possible limits (natural, social, geographical) can be circumvented or transcended 'with the right mix of ingenuity and invention' (p.10). He outlines some of the possible challenges that may result with the removal of all limits, the blurring of all barriers and the high personalisation of learning. It may possibly result in high differentiatedness that can deepen the inequalities between learners where the disadvantaged are the most affected and it may also lead to the legitimising of increasing totalitarian forms of influence and control (Perrotta, 2012). It is also important here not to forget the digital divide and the inequality it creates for people who live in 'dead zones' where there is no connectivity, or those with financial challenges who cannot afford the latest or best devices, in addition to many other challenges such as social, or gender discrimination challenges that prevent learners from having access to latest technology (Des

Bordes and Ferdi 2008; DiMaggio and Hargittai, 2001; Giannakopoulos and Eybers 2015; Selwyn, 2004; Traxler, 2012).

Other challenges include people with disabilities. Burgstahler (2002) describes a ‘second digital divide’ which is ‘a result of the inaccessible design of many electronic resources’ (p.421), causing people with disabilities to be part of the ‘have nots’ (Burgstahler, 2002; Seale, 2006).

In addition to that, in the discourse around ubiquitous learning, there seems to be some contradiction regarding the notion of *intentionality* and *purposefulness*. On the one hand, the ultimate goal of this type of learning is to have learners being provided with information at the time and place they need it through the interaction of their own devices with devices embedded in the environment in a seamless and natural manner without any explicit action on the part of the learner to initiate the learning (Kinshuk and Graf, 2012). On the other hand, one of the characteristics of ubiquitous learning is that it is personalised and learners set their own learning goals. What seems to be a contradiction in the discussions is the intentionality of learning. Does the model of ubiquitous learning aim for personalising learning based on learners’ choices or based on some sort of artificial intelligence that sets the goals for learners based on analytics of their previously recorded behaviour, preferences, activities, whereabouts, approaches to learning, etc.? Do learners choose or is the choice being made for them *seamlessly*? And by *whom*?

Cope and Kalantzis (2010) warn about a future of 'grey ecology where learners are tethered to machines', and explain that just because digital technology is ubiquitous, it does not mean that *all* learning should be mediated by this technology. The ubiquity of learning is more about the purposeful access to knowledge which is facilitated by smart devices. It is only when people purposefully seek the available knowledge that learning takes place. Furthermore, knowing or receiving information is not the same as knowledge construction, which is the main aim of learning. In other words, knowing something without being able to use it to construct one's own knowledge does not necessarily lead to effective learning. Ogata (2009) discusses the importance of awareness in ubiquitous learning explaining that even in ubiquitous learning environments, such as the one described by Kinshuk and Graf (2012), learning opportunities may be missed if learners are not aware of the chances to learn because it is awareness that initiates individual and collaborative learning. Ogata (2009) proposes a model of awareness where the learners need to be made aware of what they know and do not know to be able to decide the direction of their learning. This brings us back to the idea of intentionality, where awareness plays an important role in determining the learner's intentional decisions regarding what knowledge to seek and how. It follows, then, that to prepare learners for an age of ubiquitous knowledge construction, new educational paradigms should be suggested to foster characteristics of the ubiquitous learner who should be self-directed, motivated, engaged, competent, resourceful and capable of conceptualisation and of knowledge construction, and not merely a passive recipient of information he or she did not purposefully seek.

Keeping this in mind, it becomes important to examine instructional designs to evaluate how they utilise ubiquitous learning in a manner that leads to the shaping of the ubiquitous learner described earlier. First, the main characteristics of ubiquitous learning are to be identified in order for educationists to design learning experiences in line with and leading to ubiquitous knowledge construction. This could be achieved by designs based on both Ogata and Yano (2004) and Cope and Kalantzis (2010), because they represent the vision of ubiquitous learning that focuses more on the learner and the shaping of learner traits. Their research is not focused on machines, but rather on new ways of meaning-making that are the result of ubiquitous computing. Therefore, this study is mainly in line with their lines of thought.

Ogata and Yano (2004) identify the main characteristics to be permanency of records of the learner's constructed knowledge as well as records of the process of creating it (unless purposefully deleted), accessibility to the learner's resource at anytime from anywhere and upon the learner's request, immediacy of information retrieval to enable problem solving, synchronous or asynchronous interactivity with a network of experts or peers, situating of instructional activities in everyday life, and supported collaborative learning that leads to social co-construction and sharing of knowledge. Ogata et al. (2010) add the characteristic of adaptability to the list where the learner is able to get the appropriate information in the appropriate way at the appropriate time. This characterisation of ubiquitous learning does not exclude intentional learning as some of the above-mentioned accounts do. Examples of intentional learning include acknowledging purposeful deleting of records, accessibility upon a learner's request, and interactivity with people (which is

presumably purposeful as interactivity involves purposeful communication).

Cope and Kalantzis (2010) suggest seven moves for an effective paradigm shift towards ubiquitous learning. Following is a list of the seven moves along with a brief explanation, as given by the authors (pp.579-582).

Move 1: To blur the traditional institutional, spatial and temporal boundaries of education

As traditional institutions design learning for a specific time and space, this need not be the only option, and has not been so in the past. Distance learning and correspondence learning are proof that time and space specific learning experiences are not the only option. The means of accessing, constructing and sharing knowledge have become so advanced that it is within the reach of an increasing number of learners. Moreover, the workplace ethic requires 'life-long' and 'life-wide' learning which contradicts the traditional classroom knowledge architecture of time, space, and instructor as a gatekeeper of knowledge.

Although the blurring of boundaries has been identified earlier as a possible pitfall or challenge (Perrotta, 2012), Cope and Kalantzis (2010) stipulate that coming together at a certain time and place (the classroom/lecture hall) remains important, i.e. structure is still needed, but what goes on in that classroom can be different as it can be a continuum, an extension of learning done earlier and elsewhere or needing to be completed later, elsewhere, through a blend of formal, semiformal, informal or even non-formal learning.

Move 2: To shift the balance of agency

Traditionally, instructors provided knowledge, which was dutifully consumed by learners. This was fitting of a world of command and compliance, where media were controlled by the government or certain companies, and managers micro-controlled workers. This no longer applies to modern-day life situations where sources of knowledge are multi-dimensional and multi-modal, work is often done through self-managing teams and collaboration and media can be and are produced by anybody who wishes to broadcast their viewpoint. There is a clear shift in power and agency that needs to be reflected in educational settings. Learners and instructors can collaborate in a process of knowledge co-construction, where a learner's input is invited and encouraged into the design of learning experiences. In such an environment, instructors need to be more knowledgeable and their power would be derived from their expertise, not from control or command routines.

Move 3: To recognise learner differences and use them as a productive resource

We no longer live in an age of conformity where people receive information from the same sources or share the same history and background. We now live in an increasingly globalised world and cosmopolitan cities where people display all sorts of differences. Immigrants and indigenous people no longer have to assimilate; rather, their difference contributes to the cosmopolitanism of societies. Differences are embraced as an enriching attribute. Learners of

different cultures, backgrounds, sets of skills, preferences, etc. can all be embraced within the new learning paradigm where the sharing of experiences, skills, and knowledge enriches and diversifies the learning experience.

Ubiquitous learning allows learners to personalise their learning trajectories based on their preferences, backgrounds and life experiences. They connect with networks of their own, along with networks created and shared by other learners. “Every learner can be a knowledge maker and a cultural creator, and in every moment of that making and creating they remake the world in the timbre of their own voice and in a way which connects with their experiences” (p.581). Group work becomes a much more enriching learning experience. Instructors will need to be active members of cosmopolitan networks while at the same time joining in learner-created networks to support the creation of personalised pathways.

Move 4: To broaden the range and mix of representational modes

With ubiquitous computing, recording and transmitting information happens multi-modally. The digital capabilities enable written, audio, visual and audio-visual representations of knowledge at almost no cost. Digital devices have made possible multiple modes of meaning-making that use different grammar but has equal depth. “Educators will need to understand the various grammars of the multiple modes of meaning making that the digital has made possible, in the same depth as traditional alphabetic and symbolic forms” (p.581).

Move 5: To develop conceptualisation capacities

The technical and social architecture of ubiquitous computing is a complex one and requires metacognitive strategies and higher order thinking. Certain conceptualising capabilities need to develop to be able to navigate this architecture of menus and directories. “There is the semantic tagging of home-made folksonomies, the formal taxonomies that define content domains, and the standards which are used to build websites, drive web feeds, define database fields and identify document content. These new media need a peculiar conceptualising sensibility, sophisticated forms of pattern recognition and schematisation” (p.581). Instructors need to be experts in this type of metalanguage and apply it to fully understand its affordances.

Move 6: To connect one’s own thinking into the social mind of distributed cognition

What matters in the age of ubiquitous computing is the ability to access and retrieve knowledge though personal digital devices which enable immediate access through vast navigation. This type of distributed cognition is not new, as people have always consulted libraries and experts. Now, the information is at hand, through hand-held devices that enable access to knowledge and networks of people. This makes the device an extension of the mind. Instructors need to help learners develop such capabilities and need to develop ways to evaluate learners’ capabilities to know how to know.

Move 7: To build collaborative knowledge cultures

This move builds on move 3, embracing learner differences. Ubiquitous computing facilitates and invites the creation of communities of practice. It encourages social reflexivity and relies on peer-to-peer learning creating a culture of shared knowledge. Social networking sites are ideal to invite contributions from people who would have been outside of the learner's immediate learning environment. Therefore, educators need to build similar learning environments which are equally inviting and encourage peer learning as well as social perspectives.

These moves are in line with the earlier HEA's suggested flexible pedagogies that HE needs to shift towards. If an evaluation is to be made of cases of technology integration in HE, an investigation is needed to assess the presence or absence of these moves in the learning experience under evaluation. Such an investigation should take into consideration issues of how TEL is being integrated, without overlooking the challenges and the controversial issues that surround this integration.

There are two main technology integration policies for TEL in HE. One is through a policy of technology control or prescribed technology, the other is the Bring Your Own Device (BYOD) policy. Each has its own benefits, as well as its issues and challenges. The following section provides a brief review of the two integration policies, with specific emphasis on the challenges such as power frames and control, authority, inclusion and equity. Then, the discussion moves forward towards some suggested solutions in the form of Device Neutral Assignment strategies.

2.3. Prescribed-technology versus BYOD

With the development of technology, the access to and the construction of knowledge has gone through major changes. Knowledge is now seen to be a commodity with big questions on who owns it, who controls it and who is the gatekeeper to that knowledge (Traxler, 2010); in addition, there is the question of who benefits from it in an economy of consumerism and educational trends, with tendencies towards the consumerisation of IT. HE institutions have been increasingly adopting TEL through a variety of policies ranging from providing a prescribed type of technology where only certain types of devices and software are offered or prescribed for learners and staff, to a BYOD policy where learners and staff are either required or encouraged to use their own devices for purposes of learning and instruction. Some institutions may prefer policies of control and prescribed technology as a means of avoiding data security risks and ensuring equity among students as they will all use the same technology. Other institutions adopt a BOYD policy mainly for purposes of low-cost technology integration and better resource utilisation, in addition to increased learner engagement through personalised learning. Yet other universities may choose not to have an articulate policy with regard to technology integration and provide technology for students but also allow students to use their own devices to access the institution's network and use it for learning in general.

2.3.1. Prescribed technology policy and issues with device control

Technology is not neutral, and attitudes towards it oscillate between determinism and instrumentalism, which are more neutral, to substantivism and critical theory, which are more value laden (Feenberg, 2012). Traxler and Koole (2014) hold the belief that devices quite often reflect the ideologies of the global North and the transformative nature of the relationship between the user and the device is seen to be daunting in terms of whose principles and values control this relationship. This does not apply to devices only but extends to software as well, in that it represents the ideologies of their makers, and are often tacit and become disseminated to the minds of people who interact with them. Des Bordes and Ferdi (2008) warn that as long as device ownership and connectivity depend on material conditions, an egalitarian realisation of democratic ideology in education remains highly limited. Mishra and Koehler (2006) posit that “the task of design reveals that not every topic can be shoehorned into any technology and, correspondingly, any given technology is not necessarily appropriate for every topic” (p.1040). Moreover, in a study of student device preferences, Reid and Pechenkina (2016) found that although some students prefer not to use their own personal devices for learning, they tend to work within an ecology of devices where each device is used for a different learning task depending on student preferences and device affordances, as well as type of learning task. Therefore, learning should not be limited to one type of technology, more so an institutionally-controlled technology, since, despite the fact that a prescribed device policy has the potential of addressing security, equity and inclusion issues (Reid and Pechenkina, 2016) other issues will surface due to the degree of control the

institution exercises over the devices they provide and the implications of this. When institutions require a particular type of device, or provide it for students and instructors, any activity design will have to serve the device or at least be limited by its affordances. Traxler (2012) warns that when educational institutions prescribe or provide a particular device, they constrain and limit education and are seen to be at odds with students' choice and personalisation of their own devices. Personalised devices empower students, and by not allowing them, students' capabilities and creativity may be constrained. Moreover, controlling the device brings forth "the risk of appropriation and manipulation of services, information and device" by whomever controls it (Des Bordes and Ferdi, 2008, p.118). One example is Melhuish and Falloon's (2010) investigation of iPad use in education and how that necessitated compliance to Apple's conditions when using iCloud, iTunes and the App Store, and all the related ethical package or baggage that comes with it. Apple in such cases becomes the gatekeeper of learning and both institution and learners have to commit to Apple's terms and conditions.

Therefore, when the device is controlled, the number of apps that can be used with it is restricted too. Upon examination of English as a foreign language (EFL) apps (Martínez, Arancón and Hita, 2014) and vocabulary apps (Godwin-Jones, 2010), incompatibility issues surfaced in terms of how certain apps were only compatible with certain devices. In learning environments where the device is controlled, app choice will be limited to what is compatible with the controlled device. Stockwell (2010) points to a major limitation in mobile learning research due to the fact that a vast number of studies are of learning environments where the device is controlled, leading to little being known

about how learners make decisions with regard to device choice and use. Controlling the device is also seen to be limiting, technocentric, and not inclusive of all the potential of the ubiquity and personalisation of students' devices (Kukulska-Hulme and Traxler, 2007; Traxler, 2012). Wright and Parchoma (2011) share the same belief and add that mobile learning research points to the ubiquity and diversity of devices, but in empirical research, the device is controlled more often than not, which is a contradiction of the device ubiquity that mobile learning promotes.

2.3.2. BYOD policies: Issues of device neutrality, inclusivity and equity

Intel's chief officer, Malcom Harkins, first introduced BYOD in 2009 as a means of cutting costs and to increase employee productivity. Harkins noticed that most employees bring their personal mobile and storage devices to work and decided that instead of focusing on data loss, security breaches and reduced productivity (due to employee distractions), it is better to embrace the situation and use it as a resource management tool for the benefit of the company (Afreen, 2014). Soon, BYOD became a trend for corporates and organisations, as well as by the educational sector, where more and more schools and HE institutions started allowing student access to the institution's network through personal devices. There may not always be an articulated or detailed policy for BYOD, and implementation varies between full implementation for staff and students, to partial or small-scale implementation within individual classrooms (Reid and Pechenkina, 2016). AlOkaily (2015b) asserts that it is also possible to have a classroom BYOD policy even with limited connectivity.

BYOD, also referred to as the consumerisation of IT, is defined as a policy where employees use their personally-owned devices “to stay connected to, access data from, or complete tasks for their organizations” (Afreen, 2014, p.233). In HE, BYOD is often viewed as the way forward for technology integration, particularly in discourses relating to personalised learning (Traxler, 2016), seamless learning (Pegrum, Oakley and Faulkner, 2013), smart learning (Middleton, 2015) and low-cost technology integration (Hockly, 2012). AlOkaily (2015b) summarises the benefits of BYOD as lower-cost technology integration, increased learner engagement, increased 21st-century digital skills, anytime, anywhere access, personalised learning, learner independence, and high-speed implementation of technology integration. An important benefit is that BYOD caters for students’ preferences in terms of choice of tools to use for learning (Reid and Pechenkina, 2016).

However, there are a number of challenges that must be taken into consideration when implementing a BYOD policy. The first and foremost concern is the inequity created among students through BYOD. There is a direct statistical link between a student’s socioeconomic status and the probability of owning a smartphone (Anderson, 2014). Not all students can afford the latest and best devices, which is a core problem of the digital divide concept, along with issues of geographically disadvantaged areas in terms of ‘bandwidth’ and ‘dead zones’ (Cope and Kalantzis, 2010; Selwyn, 2004), or people with disabilities and the accessibility challenges they face in terms of digital content (Burgstahler, 2002; Seale, 2006). Circumstances where there are inequity concerns accentuate the difference between the ‘haves’ and the ‘have nots’ (Hockly, 2012) and deepen the consumerisation of IT (Middleton,

2015) creating the sort of differentiation, as mentioned earlier, that would increase the learning gap between students, causing disadvantaged students to be more disadvantaged (Perrotta, 2012).

On the other hand, Peng et al. (2009) extend the digital divide concept to include another contributing element such as the availability or lack of 'tech-savvy' teachers. Device ownership on its own does not necessitate developing digital literacy skills, hence the need for 'tech-savvy' teachers to teach such skills. In that regard, Des Bordes and Ferdi (2008) ask a relevant question: "is it a problem of affordability or the ability to learn how to use the technology?" (p.119). Seale (2010) similarly links 'not having' and 'not being able to' or 'not knowing' (p.446). This view transcends device ownership inequity and shifts the problem to the learning of digital literacy skills and more broadly, the digital agency which is 'a fundamental requirement for and through education' (Passey et al., 2018; p.425) and an important skill for a job market characterised by increasingly pervasive technologies. To that end, Middleton (2015) invites further research in areas of inclusivity within usability designs while Traxler (2016) goes further to suggest a need for a paradigm shift in the way inclusivity is viewed. Last but not least, instructors' concerns regarding BYOD are more relevant to multi-platform management, strength of WiFi signals in classrooms, battery life, availability of chargers, and possible student distractions by notifications, as these issues may affect or disrupt the learning experience (Hockly, 2012).

These challenges can be addressed through implementation of certain procedures. Institutions can invest in infrastructure, staff training and devices

for loan (Hockly, 2012; Reid and Pechenkina, 2016) to help lessen the inequity problem by giving students who do not have reliable devices access to capable devices that can enable them to learn at the same level as other students. However, AlOkaily (2015c) explains that this is a partial solution because loaner devices are shared among learners, hence cannot be completely personalised for each learner; additionally, the type of device, brand, and range of applications installed in it are all controlled by the institution, which brings back the control issues discussed earlier. Ideally, access to devices should be accompanied by access to technical and instructional support that fosters the development of digital agency. Passey et al. (2018) explain that digital agency consists of digital competence, digital confidence and digital accountability and is defined as 'the individual's ability to control and adapt to a digital world' (p.426). Equity, assert Passey at al., can be achieved by enabling learners to acquire the degree of digital agency that allows learners to be not only consumers but also producers of knowledge.

2.4. Device neutral assignments (DNA)

Whichever technology integration policy institutions adopt, there tend to be issues with it. Any instructional design for a controlled or prescribed device will be limiting and raise concerns over power and control issues. Similarly, instructional designs for BYOD policies will deepen inequity, among many other issues, as discussed earlier. Reid and Pechenkina (2016) articulate similar issues, stating the need for a policy, or strategy, that would address students' preferences and choice of technology while at the same time ensuring that access to technology is equitable. Therefore, recommendations

have recently been pointing towards device agnosticism (Wishart, 2015; Peterson-Karlan, 2015), content agnostic devices and domain agnosticism (Jisc, 2011; Johnson, 2014; Nye, 2015). The idea of agnostic instructional design simply means that any educational provision for students should not be tailored towards or enabled by any particular device, but allow for an educational paradigm that embraces both flexibility and ubiquity of learning.

One type of instructional design strategy associated with BYOD, which can also help with controlled device policy, is device neutral assignments (DNA). The concept was first introduced in 2013 by Ron Milliner, director of the Kentucky Academy of Technology Education, who worked with teachers to help them integrate technology with their previously-created assignments and redesign them to be device neutral (Fortson, 2013). This neutrality of design, equally referred to as agnosticism, ensures that the focus of the learning experience is more on the learning outcomes than on the device or the affordances (AlOkaily, 2015b). This has been identified as a key trend of mobile learning (Kochattil, 2016) and an important requirement for mobile-assisted seamless learning (Wong and Looi, 2011). Some implementations include a description of a platform for mobile learning where resources can be retrieved irrespective of device type (Wang and Li, 2008) or an integrated environment which can be accessed by heterogeneous devices (Chang and Chen, 2007; Peterson-Karlan, 2015; Reid and Pechenkina, 2016).

The concept has been elaborated on by Campo (2013), describing six strategies for designing DNA (see Figure 2.2):

- Allow choice of product. Can students show their learning through a video, website, screencast, essay or presentation?

- Co-construct success criteria. If products will be different, what makes a successful product? How will it meet the curriculum expectations?

- Use generic descriptions. Instead of requiring ‘PowerPoint’, use ‘presentation’. Instead of requiring ‘Word document’, use ‘text-based’ or ‘word-processing’.

- Suggest cross-platform services. Many apps and services can be used on all devices.

- Group students purposely. An activity may require a camera and a computer/laptop: pair a student with a smartphone with another who has a laptop. Conversely, group students with similar devices.

- Use the classroom technology. Your document camera can be used to create images, video, etc. During group work, one group can use the class desktop computer.

(Campo, 2013; Paragraph 3)

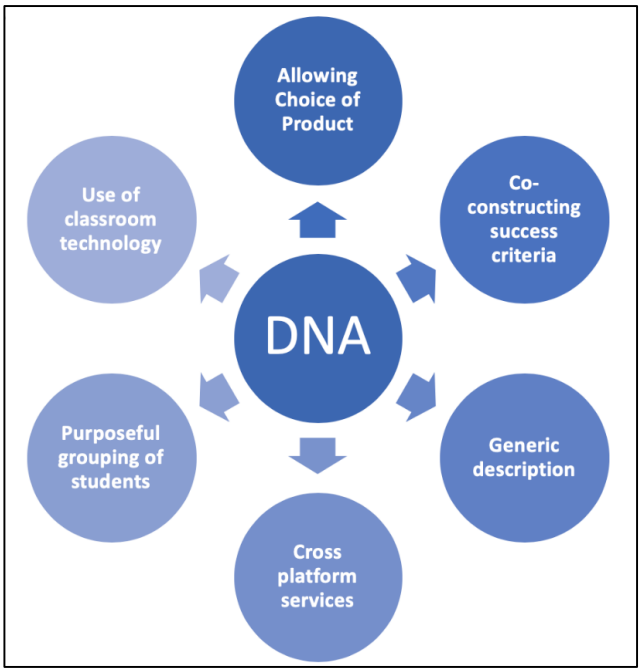


Figure 2.2 DNA FOR BYOD

These strategies have been implemented in assignment design. AlOkaily (2015a) suggests further guidelines for a neutral type of design, focusing on two aspects: flexibility in accepting different, multi-modal, assignment products, outputs and representations from students; and using the resulting assignments or artefacts as suggested possibilities for future assignments. The author continues to point out that upon implementing DNA in her classes, it was observed that students tend to 'share expertise and take pride in assuming the role of IT support for their peers' (p.58).

It is clear that these strategies deal with all aspects of assignments; the type of product is flexible and multimodal, the rubric invites student input, the instructions are generic enough to allow flexibility and embrace device ubiquity, support is provided to students through platform-agnostic services

and through making technology available, and finally, peer-to-peer cooperation and collaboration among students is enabled. These strategies are in line with both flexible learning and ubiquitous knowledge construction, and will be mapped and linked to the above-mentioned literature as part of the conceptual framework of this research.

2.5. Summary

This chapter provides a literature review on the central concepts relevant to the need for change in HE and the possible theoretical concepts that can instigate such change. Two new educational paradigms, flexible pedagogy and ubiquitous learning, are reviewed and critiqued. They are discussed against a background of institutional policies for TEL integration. The first is the policy of prescribed technology provision, which is presented in contrast to the second policy of BYOD. Advantages and disadvantages of both policies are discussed and agnosticism is identified as a possible recommended approach to TEL. Finally, DNA is presented as a central practical approach to TEL that embodies the agnostic approach to TEL and is seen to be compatible with the new pedagogies of flexible and ubiquitous learning.

Chapter 3 Conceptual Framework

The conceptual framework for Flexible Ubiquitous Agnostic Design (FUAD) principles is based on the new educational paradigms of flexible pedagogies (Ryan and Tilbury, 2013) and ubiquitous learning (Cope and Kalantzis, 2010). Both were used to underpin the concept of device neutral assignments (DNA) (Milliner, 2013), and the strategies and guidelines for practical implementation of DNA (Campo, 2013; AlOkaily, 2015a).

The six strategies have been used as a starting point, and then expanded, based on the above-mentioned theoretical concepts and based on the empirical data from the interviews, to form the seven principles of the FUAD framework.

3.1. FUAD principle 1: Allowing choice of product, tools and procedure

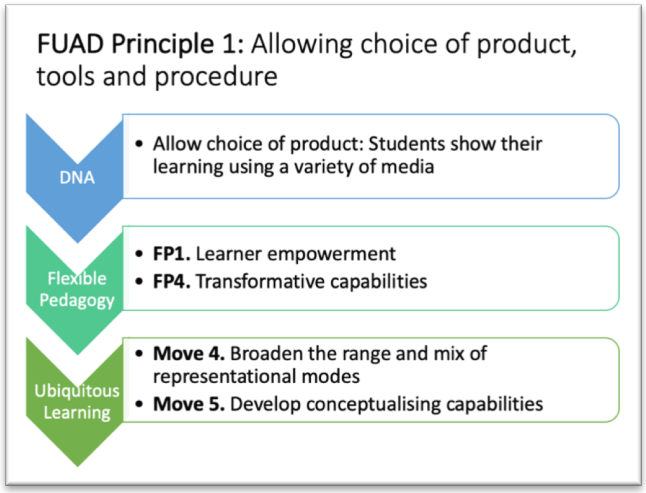


Figure 3.1. FUAD principle 1: allowing choice of product, tools and procedure

This principle (Figure 3.1) is based on the DNA strategy of allowing choice of product so that students can represent their learning in a multimodal way, i.e. through a combination of modes or resources for meaning-making (Jewitt, Bezemer and O'Halloran, 2016). According to Lackovic (2018) these modes can be speech, text, diagrams, images, drawings, clothes, digital representations, or any material artefacts. Campo (2013) invites flexibility in accepting assignments in any form a student chooses to represent their learning, such as in the form of a video, website, screencast, essay, presentation or any other medium. However, this strategy has been expanded here to include not only choice of product but also choice of tools and procedure.

This is in line with the core concept of flexible learning, as students should have enough flexibility to exercise their creativity and resourcefulness to use or experiment with tools they feel may give the required results. With this in mind, the assignment procedure may need to change, due to the use of different tools to produce different products. This is in line with the flexible pedagogical idea of learner empowerment (idea 1) through involving students in the process of co-creation, which changes the power frames that underpin the instructor-learner relationship. It increases learner agency and competence and showcases transformative capabilities (idea 4). Learners show their agency by taking decisions about how they will showcase their learning.

It is also in line with the fourth and fifth moves towards ubiquitous learning by broadening the range and mix of representational modes and using new

meaning-making tools that enhance conceptualisation capabilities and requires 'higher-order abstraction and metacognitive strategies' (Cope and Kalantzis, 2010). Chiu at al. (2008) posit that one of the characteristics of ubiquitous learning is adapting the subject content, explaining that "The u-learning environment is able to adapt the subject contents to suit the capability of various learning devices" (p.78).

However, allowing choice does not necessarily mean that all assessments have to be multimodal and products can always vary. Assignments and assessments need to be closely aligned with learning outcomes. If, for example, the assessment is of writing skills, then the product must show the learner's writing skills and more specifically the genre of writing. In another example, if a learner needs to show speaking skills or presentation skills, then producing a website or a blog post may not show the required learning outcomes. It becomes the responsibility of the instructor to ensure that the students show their learning using an appropriate mode or a mix of modes.

3.2. FUAD principle 2: Co-construction of success criteria

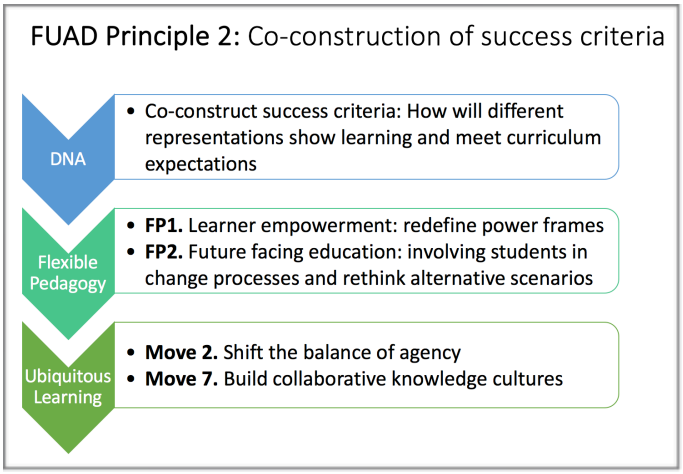


Figure 3.2. FUAD principle 2: Co-construction of success criteria

As established earlier, researchers have been questioning the nature of learning success and the predictors of that success (Traxler and Volsoo, 2014). In an earlier research, James et al. (2002) indicated the beginning of a new era in assessment where students have more choice and input in their own assessments. Cope and Kalantzis (2010) describe a need for new evaluation measures to assess a learner's metacognitive capabilities 'to know how to know' in a learning environment where learners use different tools and products (p.581). Therefore, the second FUAD principle (Figure 3.2), relevant to the evaluation of the learning experience, is based on the DNA strategy of co-constructing success criteria for assessing diversified products. This comes as a response to the question of how each of the different assignment products will meet the learning outcomes.

Following the same argument for the previous principle, flexible pedagogical idea 1 pushes towards the active involvement of students in the 'processes of co-creation'. It also addresses the flexible pedagogical idea 2 of future-facing education where learners and educators are engaged in anticipating and rethinking alternative scenarios of outcome achievement; i.e. alternative assessment criteria. Additionally, flexible learning also calls for flexibility in assessment methods and formats. James et al. (2002) refer to 'negotiated assessment', explaining that students have shown preference to have input and negotiate different aspects of their assessments (p.3). This includes negotiating criteria and weighting, among other aspects (JISC, 2011). Wanner and Palmer's (2015) study of flexible assessment showed that 85% of student participants thought that contributing to success criteria is either important or very important.

The second and seventh moves of ubiquitous learning (Cope and Kalantzis, 2010) also point to the shifting balance of agency where students are more involved in creating the success criteria and to the importance of building collaborative knowledge cultures. Moreover, one of the main social effects of ubiquitous computing is the creation of participatory culture (Cope and Kalantzis, 2010). If students are to be co-creators of knowledge, they need to have some input in the creation of the success criteria with which their newly constructed knowledge, i.e. assignment or product, will be evaluated.

The role of the instructor in this case is to invite input and work with the students to achieve a set of criteria that can assess the final product. Gregory, Cameron and Davis (1997) suggest a four-step procedure for co-construction of success criteria. The four steps are: brainstorming; sorting and categorising; posting and making a T chart; and finally adding, revising and refining. The instructor here has the responsibility of ensuring that the resulting criteria are aligned with the learning outcomes and are clearly understood by the learners and the assessors. This becomes even more crucial in situations where there are external assessors, as all stakeholders need to arrive at an understanding of what the criteria mean and how they are represented.

In many cases, the success criteria are pre-determined and approved by whichever approving body the institution uses. This makes the process of co-construction difficult, as change requires a long process of applications and approvals. Therefore, learners and educators should co-construct the meaning of the criteria in terms of discussing them and arriving at a shared

understanding of what each criterion means. This empowers students with the capability to differentiate between strong and weak performance as well as how to use the criteria to improve performance (Arter and Spandel, 1991).

This particular principle may be challenging in terms of lecturers' acceptance and implementation. The Ontario Ministry of Education (2010) lists possible challenges to lecturer adoption of co-construction of success criteria. The list contains challenges such as students' lack of knowledge and skills, students identifying irrelevant criteria, leaving out important criteria, lack of engagement in the process, or lack of time for such an exercise. However, there are strategies to tackle such challenges.

3.3. FUAD principle 3: Generic assignment description

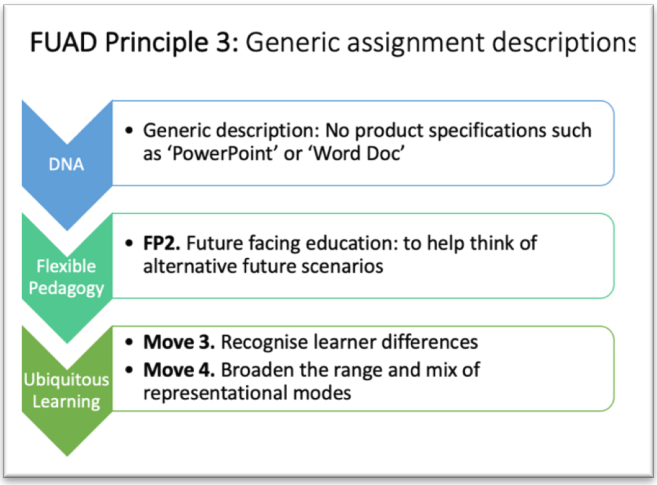


Figure 3.3. FUAD principle 3: Generic assignment description

The third FUAD principle (Figure 3.3) is based on the DNA strategy of using generic assignment descriptions. This refers to the set of instructions that

are given to the students, be it written or oral. These instructions must be worded carefully to reflect the flexibility in accepting the diversified types of products mentioned in FUAD 1. It should support device neutrality through avoiding the naming of particular devices or particular software tools, unless of course the assignment is to show skills in the use of a particular device or software. The wording of such instructions must be generic enough to allow for diversified products. For example, in the case where the students are required to produce a character analysis of one of the characters in an assigned book, the instructions should not specify the product by saying 'write a 500-word character analysis' or 'submit a Word document' because that would specify one type of product, text, and specifically in Microsoft (MS) Word. Another example would be the requirement to 'submit a MS PowerPoint presentation' because it excludes all other presentation software or other modes of assignments. Instead, the instruction should state that an in-depth analysis is required to show the different sides of that character.

Like the first FUAD principle, this fosters choice and flexibility through future-facing education where students are encouraged to think of alternative future scenarios to replace current practices (Ryan and Tilbury, 2013) and embraces the third and fourth moves of ubiquitous learning through crafting instructions that allow and accept a mix of representational modes to embrace learner differences (Cope and Kalantzis, 2010).

3.4. FUAD principle 4: Platform agnostic services

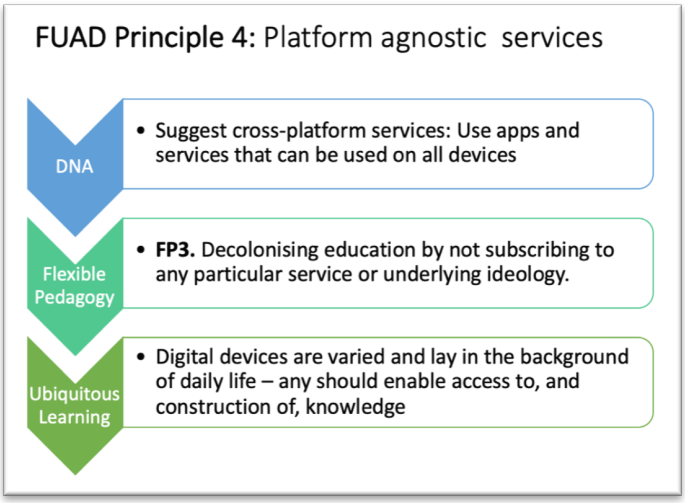


Figure 3.4. FUAD principle 4: Platform agnostic services

The fourth FUAD principle of platform agnostic services (Figure 3.4) is based on the DNA strategy of suggesting cross-platform services, which is another term for platform agnostic services. The term platform agnostic is "a concept that refers to the design attributes and philosophies of software products. A platform agnostic product runs equally well across more than one platform […] When referring to a software product, platforms typically refer to common operating systems (OS), like MS Windows, Mac OS, and Linux" (techopedia.com). Within DNA strategies, any apps or software tools or online platforms suggested for students must be accessible or compatible with any device regardless of what operating system it uses. If instructors need to suggest a choice of apps to students, or require accessing a particular software, it is important that access is possible through whichever device the student has. This is to be taken in the light of how students do

not use one particular device but work within an ecology of devices (Reid and Pechenkina, 2016; Pachler, Cook and Bachmair, 2010) that could involve different operating systems or specifications.

By doing so, the notion of control is dismissed, because requiring a particular device-specific app or software means subscribing or accepting the ideologies of the makers/creators of that device, as explained earlier (in section 2.3.1. Issues with Device Control). This falls in line with the flexible pedagogical idea 3 of decolonising education (Ryan and Tilbury, 2013). Ubiquitous learning is equally based on the idea that digital devices are varied and lie in the background of everyday life – any should enable access to, and construction of, knowledge.

3.5. FUAD principle 5: Social, collaborative, knowledge construction

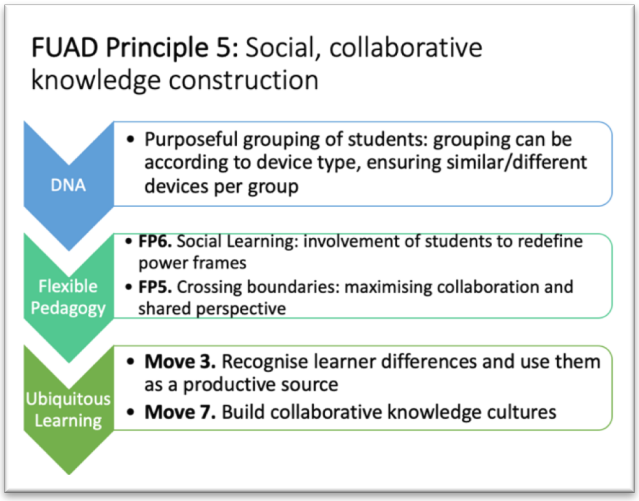


Figure 3.5. FUAD principle 5: Social, collaborative, knowledge construction

The fifth FUAD principle is social collaborative knowledge construction (Figure 3.5). It is based on the DNA strategy of grouping students purposefully so that they can collaborate and use a range of different tools, hence empowering each other. However, the grouping in the DNA strategy is based on the student's device type, suggesting to purposefully group students with similar devices together or purposefully create groups of students who have different devices. The choice depends on what might best achieve an enhanced learning experience. However, using student device type to group students may offer a limited view of grouping. Sharples, Taylor and Vavoula (2007) describe how mobile learning is 'a conversation across multiple contexts amongst people and personal interactive technologies' (p.4). This means that the view of collaboration based on technology type, as suggested by DNA strategy 5, forms only a part of the learning process. The other relevant parts are the mobilities between contexts and networks of people. Collaboration between people helps in the process of social leaning, more so when each learner in the group adds a window of access to their own previously-constructed networks. Reference is due here to the idea of distributed cognition (ubiquitous learning move 6).

Similarly, flexible learning takes the notion of group work to the broader sphere of social learning (FL idea 6), through collaboration beyond the digital tools, to develop a 'culture of co-curricular learning spaces, informal learning and social interaction' (Ryan and Tilbury, 2013; p.26). This also enables flexible pedagogical idea 6 of crossing boundaries through contextual mobility and maximising collaboration and shared perspectives.

Additionally, this principle enables the use of learner differences as a productive resource and fosters a collaborative knowledge culture (ubiquitous learning moves 3 and 7).

3.6. FUAD principle 6: Accessibility to technology and skills support

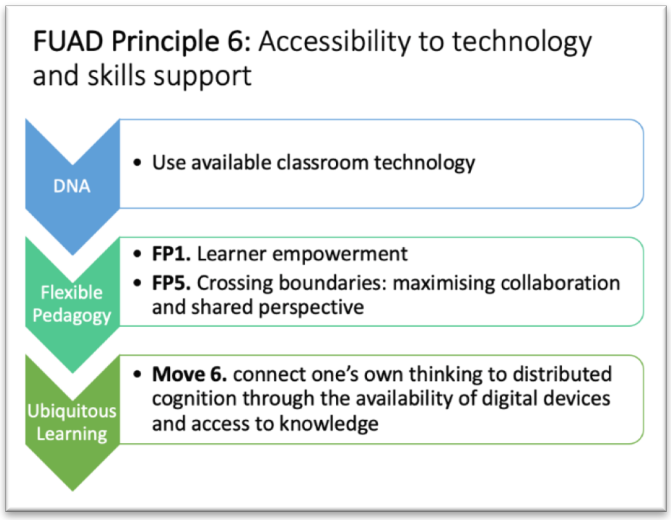


Figure 3.6 FUAD principle 6: Accessibility to technology and skills support

The sixth FUAD principle is accessibility to technology and skills support (Figure 3.6). This principle is partly based on the DNA strategy of using classroom technology such as smart boards and class computer(s). The reason behind this DNA strategy is to ensure that students who do not have access to technology still have the chance to use the technology available in the classroom, which is an attempt to increase inclusivity and reduce inequity. Another reason is to increase the variety of devices used in order to create multimodal assignment products. However, providing devices or technology is one element in the accessibility issue. Other elements and causes for inequity and the digital divide need to be addressed as well.

Passey et al. (2018) posit that acquiring digital agency is a major issue in relation to the future of equity in education. The authors define digital agency as 'the individual's ability to control and adapt to a digital world' (p.426) and explain the three components that constitute digital agency, which are: digital competence; digital confidence; and digital accountability. The authors clarify that there is a whole set of skills involved. To develop digital agency, not only digital skills are required, but also any other literacy and numeracy skills, as well as knowledge and critical thinking. Without such skills, individuals would not be able to operate in a world characterised by pervasive technology. Learners need to be able to control (adapt and adopt) to new technologies and use them wisely and responsibly. To reach levels of digital agency, such skills need to be taught and practiced. Therefore, it seems reasonable and important that a framework for instructional design includes elements to ensure that the learning experience may lead to the development of digital agency along with any other learning outcomes.

FUAD 6 goes beyond using available classroom technology. It includes providing accessibility to technology, be that hardware or software, and providing support for acquiring digital agency, including the broader frame of skills support. Seale et al. (2010) discuss technical, pedagogical and contextual or institutional accessibility. Incorporating such accessibility and skills support into the learning design may take the form of support inside or outside the classroom or through agreements with other departments or bodies within the university or outside of it. FUAD 6 is also about providing support for the set of skills needed to perform the assignment. Perrotta (2012) hypothesises that some students who come from disadvantaged backgrounds

may not have all the necessary skills to perform a task, and this would cause them to feel constant stress. These skills could be digital literacies, or any other set of skills that instructors assume students have from their previous learning experiences. This principle calls for instructors to deconstruct the assignment to see what underlying skills, digital or otherwise, are required for it and design a support system based on that. Accessibility to technology and skills support can potentially improve inclusivity, a problem associated with BYOD policies and the digital divide.

Therefore, FUAD principle 6 combines the need to provide technology with the need to provide practical and technical skills support, i.e. digital literacy skills, as well as any other underlying skills. This can be done in a number of ways. For example, if the assignment is to research a topic and create a video that sums up what the literature says about that topic, the underlying skills would be digital literacy skills such as creating, editing and sharing a video, and other skills may include citing and referencing or synthesising sources. Support could be provided in a range of ways that include, but are not limited to, providing online learning resources, teaching it during class, arranging for external workshops, inviting guest lecturers, or activating peer learning by arranging for students to share their knowledge and skills (where students who have a skill that is needed for the learning experience can share it with students who still need to acquire this skill). FUAD supports the use by individuals who select their own tools such as software and approaches, if those individuals have specific accessibility issues, they can choose alternative software and approaches to address those issues. In doing so, they are providing examples of how those accessibility issues have been

addressed. This would be a very positive way forward, as others could learn from their practice through peer learning and sharing of experiences.

Providing technology and support is an important element for flexible learning designs in order to avoid any unnecessary disturbance to the learning process (Hwang, Tu and Wang, 2018). It ensures multiple ways of learner empowerment (FP idea 1). It also enables crossing boundaries through maximising collaboration between peers, other departments, and/or outside bodies that create shared perspectives (idea 5). It additionally helps connect a learner's thinking to a distributed cognition (ubiquitous learning move 6).

It is important to acknowledge here that accessibility issues are not limited to students with socioeconomic challenges. In its broader sense, it includes accessibility of instructional design frameworks to take students with disabilities into consideration and build accessibility strategies for them as well.

3.7. FUAD principle 7: Authenticity and situated learning

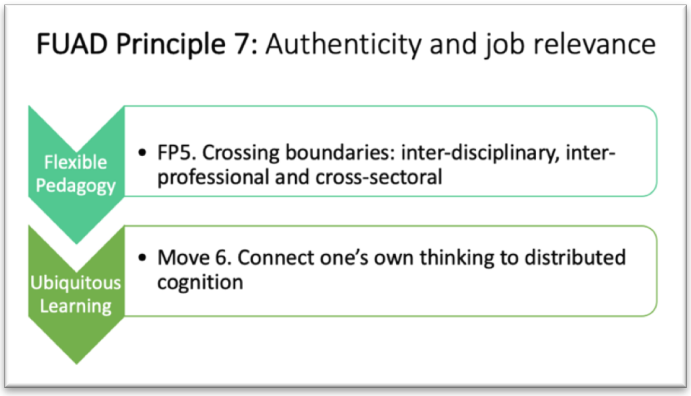


Figure 3.7. FUAD principle 7: Authenticity and job relevance

The seventh FUAD principle is that of authenticity and situated learning (Figure 3.7). This principle was added at a later stage of the research, based on findings from the early interviews with lecturers. Assignments and learning experiences need to reflect or replicate tasks from the real-world or job market and preferably be situated in a real-world context or a simulation of one. Situating learning in authentic, real-world situations contributes to the development of megacognition, which is the aspect of learning that leads to the development of an 'expert learner' capable of wider and deeper learning (Passey, 2014). Moreover, Lave and Wenger (1991) argue for the importance of situated learning, explaining that learning happens within a context and depends on the situation in which it takes place; if removed, the mind loses the power to explain learning activities. It was also noted that students prefer authenticity in assessment (Looney, 2009), while Kinshuk and Graf (2012) state that a primary requirement of successful and effective learning is situating it in real-life experiences in authentic settings.

Part of the rationale for including this principle is that HE prepares students for the job market; hence, learning experiences that are situated in a real-world context (or a simulation of it) become more effective for learning. Shih, Chu, Hwang and Kinshuk (2011) explain that ubiquitous learning is not restricted to formal learning environments such as the classroom; instead, it is situated in real and virtual worlds. This also helps in achieving flexible learning pedagogical idea 5 of crossing boundaries, inter-disciplinary, cross-sectoral, and inter-professional. It helps in establishing connections between the educational institution and the real world, particularly the job market. Ogata and Yano (2004) identify that situating

instructional activities in authentic situations is one of the main characteristics of ubiquitous learning. Additionally, ubiquitous learning move 7 argues the importance of connecting one's own thinking to distributed cognition. The connection proposed here in FUAD principle 7 is with people of the trade, such as professionals or experts, and can be established through digital devices in a way that develops the learner's skills of immediate information access and retrieval. Cope and Kalantzis (2010) explain that "you are not what you know but what you can know, the knowledge that is at hand because you have a device in hand" (p.12).

Putting all the above FUAD principles together, the result is a set of Flexible Ubiquitous Agnostic Design principles for learning experiences in HE (Figure 3.8). This FUAD framework provides practical principles to implement when designing learning experiences. It can be seen as a translation of significant theoretical concepts into practical design elements to enable the promised educational paradigm shift. These principles can be taken as recommendations for improved design. Indeed, the framework might work best when considered within whole programmes of study rather than one individual assignment. This is because sometimes a particular principle might be missing from one learning experience for justifiable reasons. If the same principle is present in other learning experiences in the programme, then the desired paradigm shift is more likely to happen. For example, not all assignments are undertaken as group work. FUAD principle 5 would be missing in this case. However, the argument may be that learners need to show ability to undertake work on their own. Another argument could be that other assignments for the same module or

programme are done collaboratively. Besides, group work can be integrated in the preparatory phases or pre-production phases of the assignment (as shown in the data collected for this study).

The FUAD framework shown in Figure 3.8 will be used in this research for evaluating lecturers' choices of TEL designs in different settings. The evaluation of the TEL designs has two purposes: the first purpose is to evaluate the learning experience design to see how successful or how close it is to achieving the sought educational paradigm shift; and the second purpose is to inform FUAD principles and help develop it as an evaluation tool.

3.8. Summary

In this chapter, the conceptual framework of the research is explained in terms of how three pedagogical concepts align to form the principles of the FUAD framework. Each of the FUAD principles is based on DNA strategies and justified and explained using the six pedagogical ideas of flexible learning and the seven moves to ubiquitous learning. The framework is further expanded based on the results of the empirical data collection undertaken for this study. The result is a framework of seven principles useful for designing and evaluating TEL experiences.

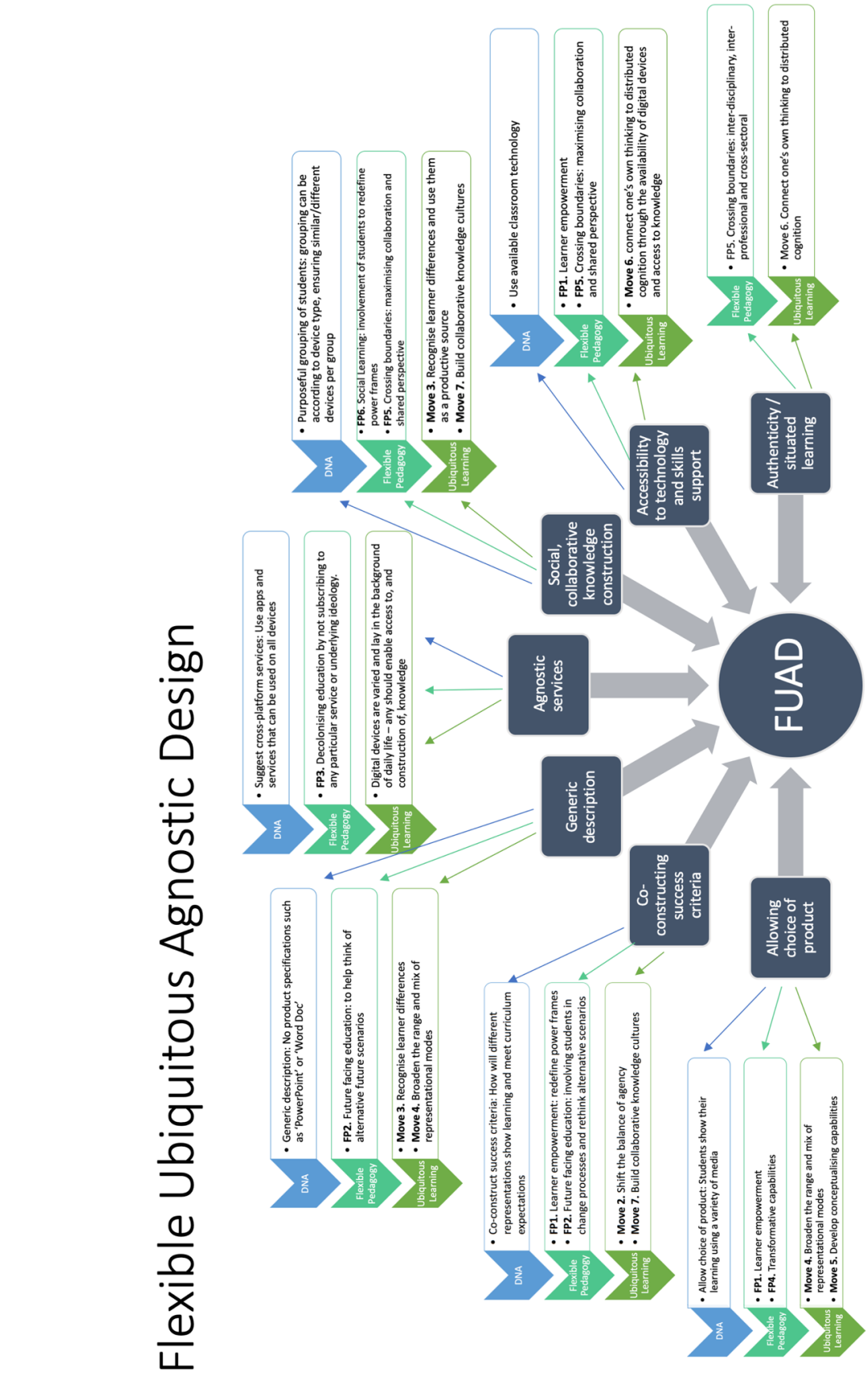


Figure 3.8 Flexible Ubiquitous Agnostic Design framework

Chapter 4 Research Design

This study follows a pragmatic research paradigm for the purpose of conducting evaluation research. The philosophical underpinnings will be established first, followed by an explanation of the methodology, methods and procedural choices. In addition, a reflexive account of the research is framed, depicting any biases and limitations.

4.1. Philosophical underpinnings

It is essential to establish the philosophical underpinnings of any research through the choice of a research paradigm. Choosing a paradigm provides the basis for the intention, motivation and research design (Mackenzie and Knipe, 2006). Evaluation research is closely aligned with pragmatism, due to the specific characteristics of this type of research. Evaluation research often involves a number of stakeholders who may have different views about reality and it is a research that is usually governed by circumstances beyond the researcher's control, such as institutional rules and regulations, which may affect research design (Clarke, 1999). Therefore, the researcher may need to adopt a pragmatic approach to be able to implement the evaluation in whichever practical way that is possible, to achieve the goals of the evaluation.

4.1.1. Research paradigm: Pragmatism

Pragmatism as a research paradigm emerged as a result of the continued qualitative, quantitative debate and was based on the assumption that there could not be one set of methods that is appropriate to pursue 'truth', and that a

confluence of paradigms may yield better, more reliable results (Lincoln and Guba, 2005). Pragmatism stipulates that the main criteria for choosing methods is what best fits with the research question of the study (Johnson and Onwuegbuzie, 2004), the 'what and 'how' of the research problem, and being able to use all available methods that help understand that problem (Creswell, 2009). Through pragmatism, the researcher's views are argued to be more holistic (Lincoln and Guba, 1986), and the choice of techniques offers more flexibility (Onwuegbuzie and Leech, 2005).

Pragmatism is based on the work of John Dewey, who established that there is not one particular claim to knowledge that can be declared as providing 'truth', but rather, "different knowledge claims result from different ways of engaging with the social world" (Mertens, 2012). Morgan (2014) summarises Dewey's philosophy of knowledge production as being based on the concept of inquiry, where beliefs are shaped by the actions that result from inquiry. Dewey also viewed realism and idealism as two sides of the same coin and that reality is shaped through people's experience of it, which leads to the idea that reality differs as experiences differ and that there is no ideal reality, but that there are different ideals and realities (Morgan, 2014).

It is important to establish here that pragmatism is an overall philosophical framework, not only relevant to methods, but goes beyond 'what works' to the research aims and the choices involved in how to achieve them (Morgan, 2014). In the literature, there is a lot of emphasis on the link between pragmatism and mixed methods, arguing that mixed methods has become the most prominent characteristic and a focal point of discussion (Biesta, 2010;

Hall, 2013; Mertens, 2012; Pearce, 2012; Tashakkori and Teddlie, 2010). However, Denzin (2012) explains that pragmatism is more than a methodology and relies on the idea that meaning-making depends on the experience and consequence of an event or an action which is socially situated. Morgan (2014) also argues that the main focus is not only on mixed methods as:

> "pragmatism can serve as a philosophical program for social research, regardless of whether that research uses qualitative, quantitative, or mixed methods. As a new paradigm, it replaces the older philosophy of knowledge approach (e.g., Guba, 1990; Guba & Lincoln, 2005; Lincoln, 2010), which understands social research in terms of ontology, epistemology, and methodology. This claim to be a new paradigm rests on demonstrating the broader value of pragmatism as a philosophical system, along with its immediate practicality for issues such as research design." (Morgan, 2014; p.1)

This point is of particular importance here because my study is not a mixed method study but a qualitative study that deploys interviews and document analysis as the methods of investigation. These methods were chosen for pragmatic purposes and were based on pragmatic reasons relevant to the fact that data were collected from different countries and different universities. This required obtaining ethical approvals and permissions to collect data and conforming to different institutional rules and regulation. Therefore, interviews and document analysis were chosen for the purpose of minimising any

possible objections to data collection. Babbie (2013) explains that the distinguishing feature of evaluation research is not the methods that evaluators use, but the purpose to which the methods are put. Evaluators must avoid loyalty to a specific paradigmatic stance and be adaptive and flexible with methods to be able to respond to particular situations and contexts (Clarke, 1999; Patton, 2015; Cook and Reichardt, 1979). Clarke (1999) explains that issues such as research budget, time restrictions, or the disruptive effects of certain methods, may be among the reasons why particular methods are adopted and others avoided.

4.1.2. Ontology and epistemology

The ontological view of this research is that reality is the practical effect of ideas, that are constantly renegotiated and interpreted in different situations (Patel, 2015) and the epistemological stance is that the useful way of thinking is the one that leads to pragmatic solutions (Anderson, 2013). This is based on Dewey's pragmatism as a philosophy that attempts to answer the question of '*what is the nature of human experience'* rather than the question of '*what is reality'*, because reality is shaped by our experience of it (Morgan, 2014). Therefore, to know is really to understand human experience of a reality as 'an active process of inquiry that creates a continual back-and-forth movement between beliefs and actions' (Morgan, 2014; p.5). This back and forth movement requires flexibility and adaptability to avoid narrow or restricting loyalty to a set of methods and to encourage innovation. Hence, reality is perceived in this research as the collective effect of the lecturers realities, which are a representation of the practical effects of their own experiences.

Lecturers' beliefs about the learning experience are reflected in their designs and are expressed in their own interpretation and implementation of the designs. The FUAD framework was constructed, interpreted and renegotiated as a result of the discussions that took place with the lecturers. Thus, FUAD reflects a shared understanding of reality. My engagement with the lecturers during the interviews was more of a participatory nature to ensure, as far as possible, that the reality shown and discussed is one that reflects, or accomodates, the reality and perceptions of the lecturers' interpretations of their learning designs.

4.1.3. Methodology: Theory-driven evaluation research

Since the purpose of this research is to formulate and test a framework for teaching and learning designs, the methodology adopted is that of evaluation research, particularly realistic, theory-driven evaluation. However, it is important to establish initially how certain terms are being used through this section and the whole research. The type of evaluation this study employs is theory-driven/theory-based evaluation: "an evaluation based on a model, theory, or philosophy which indicates the causal relationships supposedly operating in the program" (FitzGibbon and Morris, 1996; p.178). The term 'theory' in theory-based evaluation is somewhat elastic as it "may refer to something more or less explicit and articulate, more or less abstract or formal, more or less stakeholder based versus anchored in general social science theory" (Dahler-Larsen, 2018; p.9). In that sense, the FUAD framework was used as a conceptual framework and the seven principles of the framework were used as evaluation categories to depict causal relationships operating in

the intervention, i.e. the instructional design. In this research, 'theory' refers to the FUAD conceptual framework.

Another term used in the discussion of evaluation research is the term programme theory, which is defined as a "specification of what must be done to achieve the desired goals, what other important impacts may also be anticipated, and how these goals and impacts would be generated" (Chen 1990; p.17, as cited in Brousselle and Buregeya, 2018; p.91). Rogers and Weiss (2007) further explain that the term programme theory is not exclusive to programmes only, but transcends it to evaluations of policies, projects or any kind of intervention. Smith (1989) defines programme as a "set of planned activities directed toward bringing about specific change(s) in an identified and identifiable audience" (in Owen and Rogers, 2007; p.24). Therefore, in the following discussion of theory-driven, or programme theory or programme evaluation, we mean an evaluation of instructional design (intervention) by applying the principles of the FUAD conceptual framework (theory). The terms programme, activity, or intervention are being used synonymously to refer to the assignment, project or assessment that is being evaluated.

Evaluation research or evaluative research is a form of applied social science that is generally described as an activity involving 'judging the value, merit or worth of a socially planned intervention' (Clarke, 1999; p.1). It is defined in a number of ways that differ in scope ranging from defining it as an analytical process (Greene, 1994) to a policy shaping/influencing tool (Scriven, 1991), being relevant to a programme or to an activity. Lincoln and Guba (1986) refer to it as a form of 'discipline inquiry' (p.550). Sonnichsen (2000) defines

evaluations as ‘collecting and analysing evidence then disseminating the findings to identified audiences so that policy and programmatic judgments and decisions can be made’ (as cited in Miller and Salkind, 2002, p.89). Another definition by Weiss (1998) is that it is ‘the systematic assessment of the operation and/or the outcomes of a program or policy, compared to a set of explicit or implicit standards, as a means of contributing to the improvement of the program or policy’ (p.4). Clarke (1999) argues that basic research aims at discovering new knowledge; evaluation research, however, aims at using existing knowledge to guide practical action to improve it. In the case of this study, the existing knowledge was used to formulate the FUAD framework, which in turn was used to evaluate the practical action of instructional design.

There are two basic types of evaluation: formative and summative evaluation. The former is based on the participants’ perspectives and aims to evaluate and improve a developing programme, while the latter evaluates a fully developed programme by determining its value and results in recommendations, aimed at continuing or stopping the intervention or programme (Stake, 2011; Clarke, 1999). Chelimsky (1985) states that evaluation research answers three main questions: descriptive, normative, and cause and effect. The descriptive question asks about the involvement of people and the reason for their involvement; the normative questions asks whether the programme is operating as intended; and the cause and effect question asks whether the programme goals have been achieved. To answer these questions, the social context of the evaluation must be described and taken into consideration, because of its effect on the programme and the evaluation. If the evaluation is of a social intervention, there are societal

factors that influence it (Shadish, Cook and Leviton, 1991) and a number of stakeholders whose perspectives are influenced by that social context (Clarke, 1999). Therefore, evaluators must take context into consideration and acknowledge how it affects the intervention, the stakeholders and the policy makers (Owen and Rogers, 2007).

Theory-driven evaluations are a form of evaluations that involve a conceptual aspect and an empirical aspect and is defined as “an explicit theory or model of how the program causes the intended or observed outcomes and an evaluation that is at least partly guided by this model’’ (Rogers et al., 2000; p.5). It is clear from this definition, and other accounts in the literature (Broussemmlle and Buregeya, 2018; Coryn et al., 2011; Rogers, 2007; Shadish et al., 1991; Chen 1990; Weiss, 1989), that the main focus is the programme theory, while the choice of methods depends on what best tests that theory (Clarke, 1999). Such emphasis on the ‘how’ (or the causality between elements of the theory, the intervention, the context, and outcomes), distinguishes theory-driven evaluation from black-box evaluations (Scriven, 1999) where the latter mainly focusses on the effectiveness of the intervention by assessing the achievement of pre-determined outcomes (Salter and Kothary, 2014). A theory-driven evaluation is more concerned with capturing the complexity of the intervention by including the contextual elements and the stakeholder knowledge to provide an explanation of how the programme works (Mehdipanah et al., 2015). To be more specific, a realist approach to theory-driven evaluation asks “What works for whom, in what circumstances and in what respects, and how?” (Pawson and Tilly, 2004; p.2), thus, unleashing the power of explanation of how the programme works.

Theory-driven evaluation discourse featured in evaluation research in the 1980s, marking a new generation in evaluation research - the explanation generation - with the particular purpose of reinforcing the explanatory power of evaluations to help in anticipating the unexpected, and framing the effects of the contextual characteristics of a programme (Brousselle and Buregeya, 2018). This type of evaluation is mainly concerned with constructing and clarifying a set of assumptions and identifying the causal chain of events between these assumptions and the intervention (Dahler-Larsen, 2018). Other types of evaluations, such as theory-based, theory-anchored, theory-oriented, realistic evaluation, contribution analysis, logic model, etc., share the same purpose and definition, and therefore can be categorised as closely similar to theory-driven evaluations (Brousselle and Buregeya, 2018; Dahler-Larsen, 2018).

A programme theory can be formulated as part of the intervention or reformulated for the purpose of the evaluation (Vedung, 1997). It guides the evaluation design from the conceptualisation stage, through implementation and interpretation, guiding evaluation questions and the dissemination of results (Coryn et al., 2011; Pawson and Tilley, 1997). However, Coryn et al. (2011) explain that programme theory is shaped in cooperation with or involving insights from stakeholders. Involving stakeholders improves usability of the evaluation findings and improves the programme theory by reducing blind spots; however, stakeholders have tacit knowledge of the programme and may have reasons to share or not to share their views (Clarke, 1999). Dahler-Larsen (2018) states that there needs to be a consensus between evaluator and stakeholders on the theory which is used for a programme

evaluation.

Formulating the programme theory (FUAD in my case) is not the problematic part. It is the consensus that is needed between the evaluator and the stakeholders that can be problematic. Different stakeholders may have different interpretations, motives, views, circumstances, etc., which can cause conflict and ambiguity. In the case of my research, any lack of consensus or differences in views regarding any of the FUAD principles were embraced as enriching insights to the framework. The lack of consensus on a particular principle provided a challenge to re-examine the principle or as an indicator for the need for further research.

At the outcome stage of the research, the usability of evaluation research is an issue that needs particular attention and planning. Babbie (2013) notes that evaluation research results may not always be embraced or put into practice and proposes three reasons for that. First, the communication of results may not be easily comprehendible to non-academics; second, the results may discredit long-held beliefs; and finally, there may be implications or results that contradict the interests (personal or otherwise) of certain bodies. Clarke (1999) explains that the main factors affecting usability of evaluation results are evaluator commitment, stakeholders' involvement, contextual elements, and an evaluator's characteristics. Clarke (1999) cites Patton's (1986) stakeholder-oriented approach to evaluation, which stresses the importance of 'communicating the right information to the right people', which can lead to increased chances of utilisation, which in turn can lead to 'bridging the gap between knowledge and action' (p.179).

Saunders (2012) takes a social practice approach to use and usability of evaluation outputs, where use refers to how the outputs may or may not be used as a resource for change in practice within the context of an evaluation. He presents a definition of practice “as sets or clusters of behaviour forming ways of ‘thinking and doing’ associated with evaluation use” (p. 246), and points to the importance of planning use and usability in the design of the evaluation, asserting that the positive impact of an evaluation lies in understanding it as a knowledge resource for new practices (i.e. change in behaviour). Therefore, to increase the use of this evaluation research, and within my role as an evaluator with a participatory approach to the evaluation, each interviewee was presented with a summary of the evaluation results along with a set of suggestions to improve the assignment under study. Lecturers were invited to discuss the possible changes and encouraged to implement them and share the results. A number of lectures agreed, implemented the changes and shared the results (details in chapter 5: Findings and Chapter 6: Results and Discussion).

4.2. Designing the evaluation research

The evaluation that was carried out in this research focused on how the design of TEL assignments fit or align with the FUAD framework. The design adopted for this research is in line with the four core steps of realist evaluation (Pawson and Tilley, 1996; 2004) which are: 1) formulating and articulating the programme theory; 2) collecting data to test the programme theory; 3) data analysis; and 4) interpreting the data and refining the theory. Following, is a detailed articulation of this evaluation research design.

The first stage of the design was the formulation of the FUAD framework, i.e. programme theory (shown in Figure 3.8) through the synthesis of existing theoretical concepts and practical strategies. The background concepts, of flexible pedagogies, ubiquitous learning and device neutral assignments, were researched and explained through a literature search (Chapter 2: Literature Review) and from this the FUAD framework was formed and articulated (Chapter 3: Conceptual Framework). This initial stage of formulating the theory is described by Pawson and Tilley as the most distinctive phase. Pawson and Tilley assert that the sources for formulating the theory are varied. In addition to a literature search, document analysis and interviews may also be involved. Interviews with programme architects (lecturers who designed the intervention) were noted to be particularly important because it leads to fine tuning of the programme theory in terms of "what works for whom and in what circumstances and respects" (p.9).

The second stage was the data collection stage. After having formulated and articulated the FUAD framework, the next step was to collect data for the purpose of examining both the framework and the instructional design through alignment of what the assignment is, how it is carried out and in which circumstances. Pawson and Tilley assert that all sorts of data can be of value here. The methods carried out for this study were in-depth interviews and analysis of assignment documents such as rubrics, instructions, and any other assignment-related document such as any available description of it in the module handbook. "The evaluator has, quite literally, to scavenge for the best data to test out the theories" (Pawson and Tilley, 2004; p.11). As stated earlier, quantitative methods were not added for pragmatic reasons.

However, in the case of this study, the first two stages overlapped in that document analysis and interviews were used as data collection methods for assessing the FUAD framework itself as well as for evaluating the intervention (i.e. the assignments). The interviews Pawson and Tilley suggest in the first stage are mainly to help articulate the programme theory, but the ones required in the second stage are mainly for the purpose of getting a detailed understanding of the successes and failures of the current programme (i.e. the assignment) and the context in which it operated. The interviews of the second stage of this research were for the sake of the evaluation of the application of the programme, as well as to inform the development of the FUAD conceptual framework. Therefore, in this research, there was an overlap between these two stages due to the dual nature of this evaluation: evaluating the FUAD (programme theory), as well as evaluating the intervention (the assignments designed by the lecturers).

The third stage was that of data analysis. The sets of data that were collected were analysed using thematic analysis (Flick, 2009) to examine if “the model [FUAD] will explain the complex footprint of outcomes” (Pawson and Tilley, 2004; p.11). In this stage, two actions were taken. The first was the explanation of certain successes of the assignment through the principles of FUAD; and the second was the diagnosis and analysis of certain reported shortcomings or concerns, where the causes were identified and due to the lack of one or more FUAD principles. This in turn led to recommendations of possible amendments to the instructional design. The data sets were grouped, compared and sub-grouped. Pawson and Tilley (2004) explain that:

> "[t]he primary tactic is thus to interrogate these hypotheses by making sub-group comparisons. Overall, the explanatory theory is investigated by devising and testing out multiple comparisons identifying winners and losers amongst subjects and pros and cons in programme delivery" (p.11).

The final stage is reflection on analysis for the purpose of interpreting the results of the grouping and subgrouping of data sets. This is the stage for answering the main research question of how compatible the learning experience is with the FUAD framework; and the sub-questions of how the FUAD framework and the learning experience can inform and further develop one-another. According to Pawson and Tilley (2004), some unanticipated results may have a puzzling effect, but in the case of this study, the new elements were embraced as welcome additions to the formulation of the framework. Pawson and Tilley (2004) describe this stage as "an ever-repeating cycle" (p.11) that can be carried out within the same evaluation or in future evaluations of the same nature.

As explained earlier, the stages of the research overlapped and the progress was more circular and re-iterative than linear. Figure 4.1 explains how each stage gave feedback to the previous stage and fed forward to the next stage. The result of the overall research is a preliminary framework that needs to be further tested through a mixed methods approach and through including the students' perspectives and possibly administrative perspectives as well.

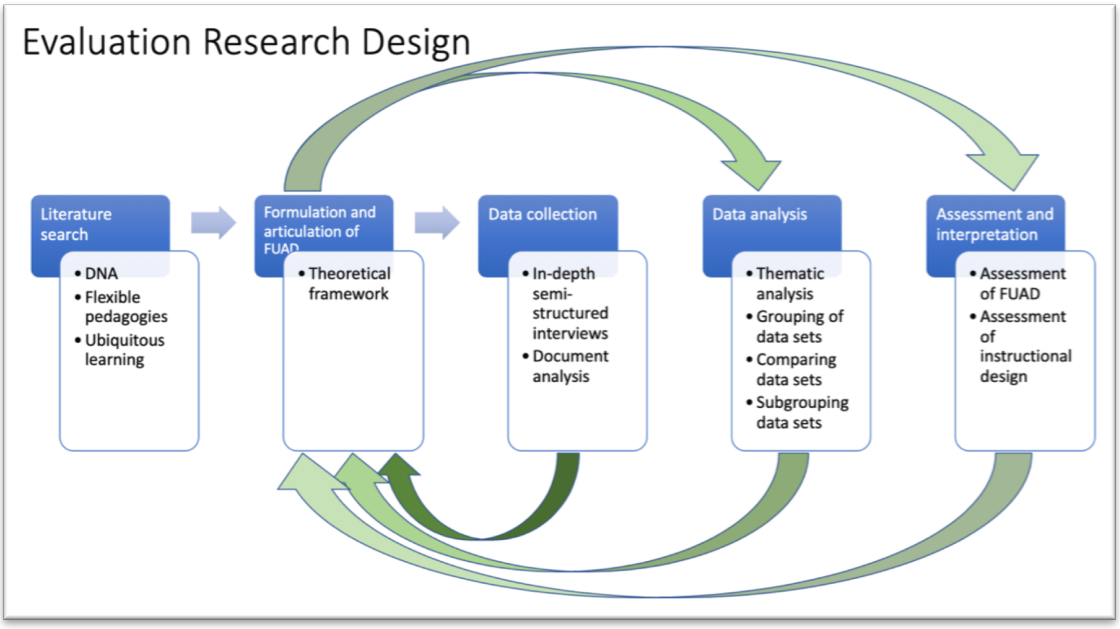


Figure 4.1. Research design

Additionally, use and usability of the evaluation is another important aspect that needs to be included in planning and designing the evaluation (Patton, 1997; Saunders, 2012). Saunders (2012) explains that increasing stakeholder engagement leads to more use of evaluation. He mentions two points: the first is working alongside colleagues; and the second is analysis of context-based enabling and inhibiting factors. Therefore, the interview questions included probing the lecturers to discuss any enabling and inhibiting factors to seek to improve the evaluation use. Additionally, the evaluation of the learning experience was shared and discussed with the interviewees so that improvement suggestions could be reached as a shared effort. This resulted in more engagement of lecturers in effecting a change in practice in some cases, increasing evaluation use (as mentioned earlier).

4.2.1. Sampling

A sample frame is formulated by identifying the target population and deciding on a strategy of how to choose participants. The resulting sample needs to be representative of the target population, authoritative, knowledgeable, credible, as well as accessible, of a reasonable size, and fits with the overall research design (Newby, 2014; Cohen, Manion and Morrison, 2011; Gray, 2004).

Since this research is an attempt to formulate a framework for instructional design of learning experiences, the data that need to be collected should lead to evaluating and refining the framework as well as to evaluating and informing the instructional design itself. Therefore, the pertinent target audience for these types of data is the lecturers who design the learning experience. Getting their perspective on the assignment design and on the implementation of the design will help understand how designs are made. It also leads to some understanding of the causal relationships between different elements of the design and any reported successes or shortcomings. This, in turn, can inform the FUAD framework in the sense of refining, removing or adding elements that are not in the framework initially. It also tests whether the FUAD framework can be used as a lens and a diagnostic tool.

For the above-mentioned purpose, a non-probability, purposive sample, also known as a judgment sample (Miller and Salkind, 2002), was used to identify lecturers who had designed TEL experiences. According to Teddlie and Yu (2007), a purposive sample is used to achieve representativeness, enable comparison, focus on unique issues, and can lead to the generation of theory

or broadly defined themes. In a purposive sample, the researcher uses her own judgment in identifying respondent lecturers according to pre-set criteria (Burton, Brundrett and Jones, 2008) that form the sample frame. In the case of this research, there are three main pre-set criteria for inviting participants to share their assignment designs (Figure 4.2). These are: 1. assignment features in terms of targeting different assignment products from a variety of disciplines, specific assignment features, type of work (individual or group work), and weighting of assignment or project; 2. different levels of study: tertiary, undergraduate, and post-graduate; and 3. context: different HE institutions in different countries.

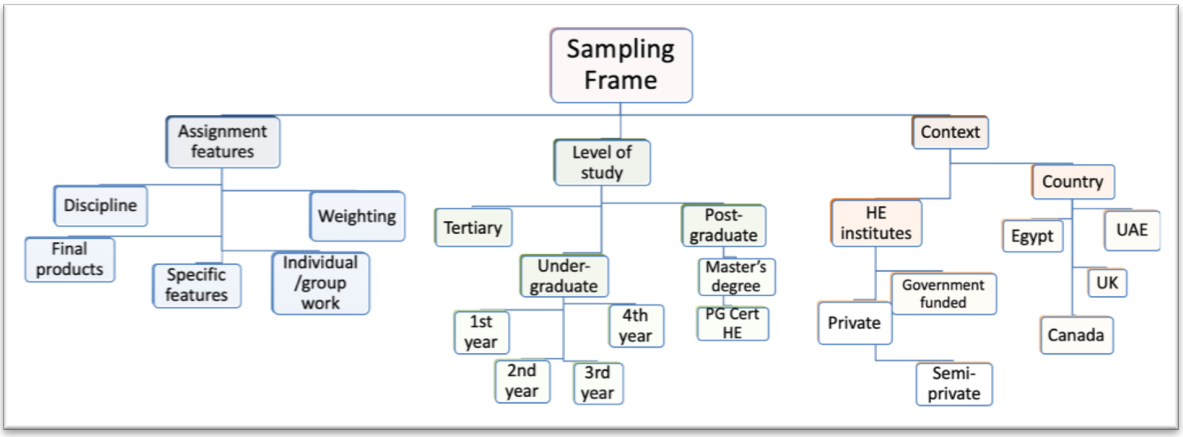


Figure 4.2. Sampling frame

The sampling strategy adopted for this research follows seven of Cohen, Manion and Morrison's (2011) eight stages for planning a sampling strategy (Table 4.1). A non-probability, purposive sample of 16 assignments was chosen and the lecturers who designed them were invited for an interview. Access to lecturers and assignments was possible due to the fact that they were part of the researcher's professional network. Some were approached personally, others through email or LinkedIn. Stage 8 was not applicable as

there was no need to adjust data. Data were qualitative, and all details were embraced as enriching insights to the research.

	Eight stages for planning sampling strategy (Cohen, Manion and Morrison, 2011)	Application in this study
Stage 1:	Sample or whole population?	Sample
Stage 2:	Identify the population, sampling frame, and size.	Population: lecturers Sampling frame: a variety of assignment features, different study levels, and different contexts. Size: 16
Stage 3:	Identify the kind of sampling strategy	Non-probability
Stage 4:	Ensure that access to the sample is guaranteed	Access granted
Stage 5:	Identify the people whom you require in the sample.	Lecturers
Stage 6:	Calculate the numbers required	16
Stage 7:	Decide how to gain and manage access and contact (e.g. advertisement, letter, telephone, email, personal visit, personal contacts/ friends).	Personal and professional network
Stage 8:	Be prepared to weight (adjust) the data, once collected.	N/A

Table 4.1. Stages of planning the sampling strategies

The choice of lecturers to interview was initially based on the above-mentioned criteria of assignment features, level of study and context (institutional and geographical). Having set these criteria, the first round of invitations for interviews was sent to colleagues at my work place. I approached nine lecturers, three because they were known for their innovative approach in teaching (assignments 5.1.1. smart object prototype, 5.4.1. App

design, and 5.7.1. PID) and two because they taught post-graduate students (assignments 5.2.1. mini conference presentation and 5.7.2. private cloud platform), and the remaining four were approached because they were in different departments (the business school: assignment 5.8.1. taxation coursework; foundation programme: assignment 5.6.1. sustainability leaflet; and two from the media department). However, the latter two from the media department only shared documents and did not give an interview; therefore, they were excluded. For the second round, I contacted lecturers from my professional network of colleagues whom I have previously worked with or met at conferences and academic events. Invitations for interviews were sent to colleagues in different countries based on their geographical location, to ensure that the sample was more international; two from Canada: assignments 5.1.2. DAL project and 5.8.2. logical database design; one from Egypt: assignment 5.4.2. Arabic language assessment; and one from Oman and one from the United States who only shared documents but did not give an interview, and therefore were excluded. Four lecturers were contacted due to their affiliation with government-funded institutes in the United Arab Emirates (assignments 5.2.2. vocabulary video, 5.3.1. lesson plan, 5.6.2. reflective journal, and 5.6.3. case study presentation).

Contacting lecturers from different contexts (educational and geographical) was deliberate, and resulted in achieving a variety of assignment types in terms of final assignment product. More specifically, I approached three lecturers particularly because I was aware that their assignments included special features that could inform the FUAD framework in different ways. The mini-conference assignment (5.2.1) was selected purposefully, because it

featured inviting students to co-construct success criteria. Therefore, understanding the lecturer's perspective on why she chose to do that would inform the argument for FUAD principle 2: Co-construction of success criteria. Similarly, the sustainability leaflet assignment (5.6.1) was chosen as I was aware that students struggled to complete it due to their lack of digital literacy skills. Hence, the lecturer's perspective could inform detail for FUAD 6: accessibility to technology and skills support. The listening lesson plan assignment (5.3.1) was chosen because of the type of assignment and how it required students to present a lesson to their peers, coupled with the type of freedom the instructions of the assignment allowed. This would inform FUAD principle 3: generic assignment description.

The resulting sample (see Table 4.2) consisted of sixteen assignments from six different universities in four different countries. The assignments were from ten different departments and varied between individual work to group work, formative to summative, from heavily-weighted to bonus grade. Assignment types included coursework, multi-product assignments, hands-on implementations, leaflet, poster, video, essay, reflection, case study and lesson plan.

Sample Details		
Assignments	16	
Universities	6	Private, Semi-Government, Non-profit
Countries	4	UK, Canada, United Arab Emirates, and Egypt
Level of study	HE	**Tertiary** level **Undergraduate**:1st year, 2nd year, 3rd year, final year **Post Graduate**: Masters Degree - Certificate
Departments	10	**Tertiary level**: Foundation program - Intensive English Programs **Undergraduate**: Business - Computing - ICT - Medical Neuroscience - Medical Diagnostic Imaging - Interior Design - Education - Arabic for Non-native speakers. **Post Graduate**: MA Computing - PGCert HE

Table 4.2. Sample details

This sample was large enough to generate thick descriptions and to reach saturation but not too large to cause data overload or move towards generalisability (Onwuegbuzie and Leech, 2005). By saturation, I mean that data analysis was no longer giving new ideas and started to repeat and confirm data sets.

4.2.2. Data collection: Interviews and document analysis

Owen and Rogers (1999) state that good evaluators adapt their approaches to the goals, aims, and context of the evaluation situation. Evaluation research can be a theory-testing process where the theory is derived from literature search, document analysis, stakeholders' perspectives, and logical reasoning (Clarke, 1999). This statement outlines the sources that could form, inform and test evaluation theory, which makes evaluation research very much an inductive process where the researcher allows the programme theory (FUAD in the case of this study) to emerge, first from the literature, and continues to shape through data collection. Clarke (1999) explains how researchers have stressed the importance of qualitative methods in evaluation research to

capture the perceptions and the experiences of individuals and groups involved in a programme. Clarke continues to explain that a variety of qualitative methods, such as in-depth interviews with participants and observations of activities, are considered necessary.

An effective way to do that is to adopt a responsive approach to evaluation (Stake, 2011) where the evaluator develops close relationships with stakeholders and adopts a more involved role in the evaluation. This was done with a number of assignments in this study. Close involvement was possible because six of the 16 assignments were in the same university where the researcher works, which granted better access and closer collegial relationships with interviewees. In three other cases, of assignments from other universities, a more involved relationship was somewhat possible due to follow-up plans where adjustments were suggested and negotiated, and plans were made for joint research concerning implementations of FUAD principles. Of the above-mentioned follow-up and implementation suggested to the interviewees, there has been one full implementation of suggestions, three cases are currently under implementation and another three cases accepted the suggestions and showed intentions to implement them. This creates a more involved relationship with the programmes under evaluation and leads to more detailed, deeper insights into the programme, as well as better informing the FUAD framework.

The main methods that were used to gather evidence for the evaluation were semi-structured interviews, and document analysis. The initial plan was to do class observations and analysis of students' finished assignments. However,

due to the fact that the assignments were collected from 6 different universities in four different countries, it was not practical to go through the ethical approval process to gain permission for class observations and gain access to students' submitted assignments. Moreover, class observations are sometimes considered intrusive and data collected through observations may not reflect the actual situation of the class.

4.2.2.1. Interviews

Interviews are seen as a suitable tool for data collection in evaluation research. Guba and Lincoln (1981) describe interviews as the backbone of evaluation research (as cited in Clarke, 1999) because of the in-depth information that can be obtained from interviewees (Cohen, Manion and Morrison, 2011). It allows interviewees to give a detailed account of their experiences and reflect on what works, what does not and what can be done differently (Boyce and Naela, 2006). Moreover, once rapport is established between the interviewer and interviewee, Gary (2004) believes that people actually enjoy talking about their work more than filling a questionnaire and that it "allows them an opportunity to reflect on events without having to commit themselves in writing, often because they feel the information may be confidential" (p.214).

Sixteen semi-structured interviews were conducted with lecturers who designed learning experiences. Main categories were identified but procedure, exact questions or question sequence varied from one participant to the other to allow participants to digress and add detail and depth to their account

(Cohen, Manion and Morrison, 2011; Denscombe, 2007; Gray, 2004). The main categories in this research were the 7 principles of the FUAD framework, as explained in the conceptual framework (chapter 3) and were used to generate the interview questions. A conversational, interactive style of interview (Mercer, 2007) was adopted, to maintain rapport and encourage interviewees to explore various aspects of their own designs and implementation of learning experiences. Many steps were taken to make the interviewees comfortable (place, mode, active listening, and clarification of purpose). Clarke (1999) adds that active listening plays an important role in the success of the interview and the evaluation.

Prior to the interview, interviewees were sent an invitation by email, along with a Participant Information Sheet and a consent form. Interviewees were given the choice of where to meet, their office, coffee shop, home, etc., and how to meet, face-to-face, telephone or by videoconferencing. During the interview, participants were asked about the project, assignment, or task that they designed for students. They were asked to share the instructions, rubric, success criteria and a sample of students' submitted assignments prior to the interview so that the interview questions could be planned around the assignment. For example, the participants were asked to provide information on the type of assignment and the intended outcomes, evidence of whether or not the outcomes had been met, and evidence of any other unintended outcomes. This is in line with Gray's (2004) suggestion that in the initial stages of the evaluation, the participants should identify their objectives of the design and the change in behaviour that is likely to result from the implementation of their design.

In addition, the FUAD principles were used as open prompts during the interview. Planned questions were intended to probe each principle, as well as other questions asking about enabling and inhibiting factors in the learning experience. The interviewees were asked questions such as whether students were allowed choice of assignment product (FUAD 1), how the success criteria were formulated (FUAD 2), whether cross-platform services were suggested (FUAD 4), whether or not students worked in groups and how they were grouped (FUAD 5), whether all students had access to technology and/or allowed choice of technology (FUAD 1 and 6). In addition, some other probing questions elicited the lecturer's role to determine power balance. Data from the interview were coded and analysed thematically (Braun and Clarke, 2006) to draw conclusions based on the FUAD framework (see Figure 4.3 exemplifying coding for thematic analysis). The inferential process undertaken to analyse the interviewees' answers is detailed in section 4.2.2. 'data analysis and unit of analysis', where an explanation of how interviews were analysed using codes generated from the FUAD principles is given, as well as showing new codes that emerged from the data.

4.2.2.2. Document analysis

A document is any record of an event or a process (Cohen, Manion and Morrison, 2011) and in many cases is considered as an informative source of data for the evaluator. To find data, documents need to be carefully analysed and interpreted to understand the meaning within its context and understand "the information relayed and the underlying values and assumptions of the author, as well as any arguments developed" (Cohen, Manion and Morrison,

2011; p.253). Documentary sources are either primary or secondary. Primary documentary sources are those “documents compiled by individuals who have first-hand experience of the events described,” while secondary documentary sources are those “produced by individuals who do not possess personal knowledge of the situation” (Clarke, 1999; p.83).

In this study, the documents examined were primary documents relevant to each of the 16 assignments that were evaluated. These documents were mostly written by the interviewees, who were the designers of the assignment or the module, i.e. written by someone who had first-hand experience of the assignment. Such documents can contribute valuable information about the formal goals and aims of the activity under evaluation (Clarke, 1999), as well as aspects like the success criteria and type of work required. Additionally, each interviewee answered questions regarding the assignment documents to shed more light on the information relayed in the document. This sought to make the documentary analysis more reliable because it reduced any subjectivity or bias on the part of the researcher and it provided an additional source of information that could either confirm or contradict the information given in the interview. For example, the instructions document can confirm the interviewee claims regarding how much freedom of choice students had when doing the assignment.

4.2.3. Data analysis and unit of analysis

The data from the interviews and from the documents were analysed using a hybrid approach of inductive and deductive thematic analysis. Organising

meanings into themes is a skill generally needed within qualitative research (Holloway and Todres, 2003) as it is a process of examining the data, recognising patterns, and identifying important or relevany themes to be used as units of analysis (Fereday and Muir-Cochrane, 2006).

Braun and Clarke (2006) explain two approaches to thematic analysis: the inductive approach or data-driven, and the deductive approach or theory-driven. The inductive approach is when the themes emerge from the data itself not from a pre-constructed coding frame or any analytic preconceptions by the researcher. On the other hand, the deductive approach is when the themes emerge from a pre-constructed theory or some "a priori template of codes" (Fereday and Muir-Cochrane, 2006; p.83). However, it is sometimes difficult to draw a distinct line between the two approaches. For example, within the inductive approach, Braun and Clarke (2006) note that "researchers cannot free themselves of their theoretical and epistemological commitments, and data are not coded in an epistemological vacuum" (p.84). Therefore, a purely inductive thematic analysis may be ambitious or challenging.

The approach adopted for thematic data analysis in this study was a hybrid approach, similar to the approach adopted in Fereday and Muir-Cochrane (2006) who used a hybrid, inductive-deductive approach to interpret qualitative data for a doctoral study on the role of performance feedback in the self-assessment of nursing practice. This hybrid approach guided the inferential process undertaken in the analysis which allowed the initial principles of FUAD to guide the coding process while at the same time allowing any other data-driven codes to emerge (Figure 4.3). The formulation and synthesis of codes

into themes, both initial theory-driven themes (the 6 initial FUAD principles) as well as the data-driven themes (enablers and inhibitors), came as a result of reading and re-reading the data. Consequently, a refined FUAD principles framework emerged with one new principle, authenticity (FUAD 7), added to the framework and new sub-themes to extend a pre-constructed FUAD principle.

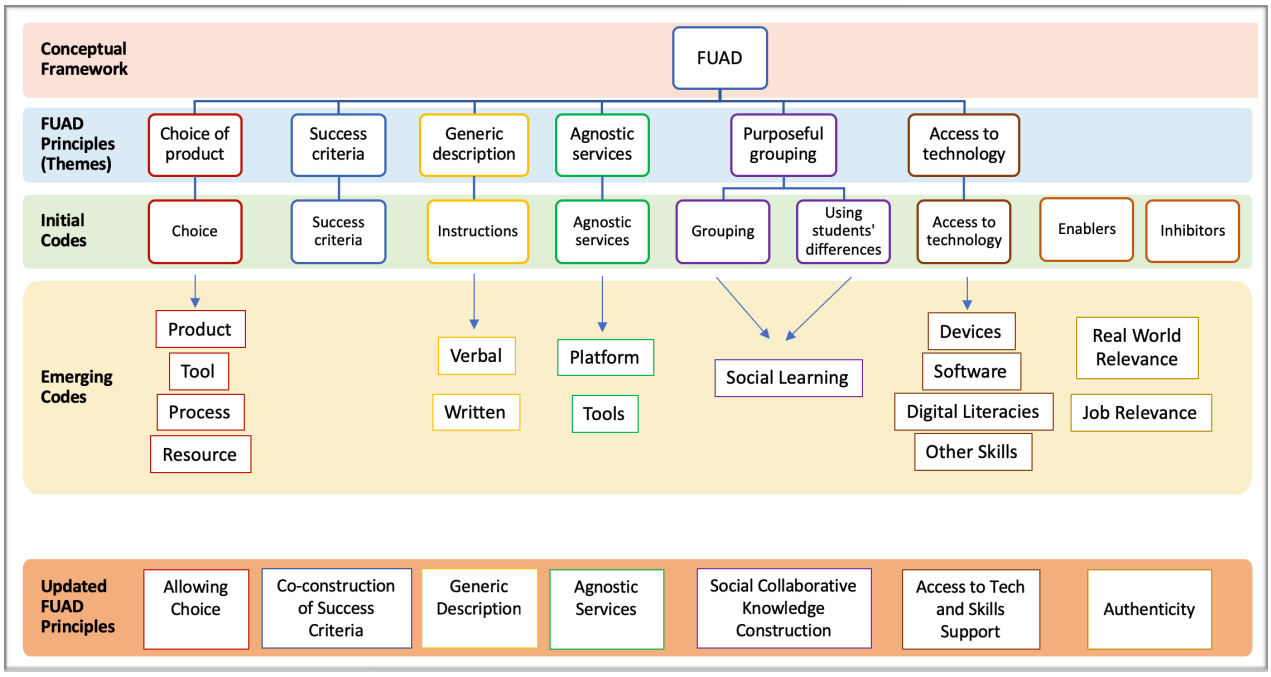


Figure 4.3. Coding for thematic analysis

The analysis was non-linear and reiterative as data collection and analysis happened concurrently. Each data set, of assignment, interview transcript and relevant documents, were read, re-read, coded, analysed and resulted in refined codes which in turn were used with the next assignment interview and documents. Therefore, the coding and analysis of each data set grew as analysis progressed. Generally speaking, the process of analysis in this study followed Braun and Clarke's (2006) six phases of thematic analysis (Table

4.3), though, as mentioned, in a rather non-linear way.

Phase	Description of the process
1. Familiarizing yourself with your data:	Transcribing data (if necessary), reading and re-reading the data, noting down initial ideas.
2. Generating initial codes:	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.
3. Searching for themes:	Collating codes into potential themes, gathering all data relevant to each potential theme.
4. Reviewing themes:	Checking if the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic 'map' of the analysis.
5. Defining and naming themes:	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names for each theme.
6. Producing the report:	The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis.

Table 4.3. Braun and Clarke's (2006) phases of thematic analysis

Phase 1: Familiarising yourself with the data

There were four stages of familiarisation with each data set of an assignment. The first stage started before the interview as the assignment documents were examined and additional questions about some elements in the assignment were noted down. The interview conversation functioned as a second, more detailed look at the assignment. Transcribing the interview was the third stage of familiarisation with the data. Then came the first overall reading of the transcript while noting down some codes.

Phase 2: Gathering initial codes

The initial codes were gathered from the literature search, which led to the formation of the FUAD conceptual framework. The very initial codes were based on the 6 initial themes derived from the principles of FUAD. The assignment documents and interviews were examined and coded. Examples included, but were not exclusive to, aspects such as whether the instructions were generic enough to allow for student choice and creativity, whether there was an articulation of what options students had or whether the success

criteria were fixed, flexible or co-constructed. Therefore, codes such as ‘instructions,’ ‘choice’ and ‘success criteria’ were among the initial codes. Additionally, two more initial codes, ‘enabler’ and inhibitor,’ were added due to the fact that this was an evaluation research, and investigating enablers and inhibitors was part of the evaluation and could give important insights to the refinement of the FUAD framework as an evaluation tool.

Phase 3: Searching for themes

After looking at the coded data, 15 new sub-codes emerged. For example, upon examining the data coded ‘choice,’ it was clear that choice was not only relevant to the type of final product but also to the choice of resources, tools, and procedures as well. The six initial themes of the framework expanded and two additional themes emerged - authenticity and support.

Phase 4: Reviewing themes

In this phase, the themes were reviewed in relation to the entire data, to consider the validity of individual themes. Upon synthesising the information relevant to each code, and reviewing how they related to the themes, both initial and emergent, some new themes were combined together. For example, the initial theme of providing technology evolved to providing technology, providing digital literacy support and other (non-digital) skills support.

Phase 5: Defining and naming themes

This is the stage where themes get defined and refined by looking at the broader meaning, examining proposed merging of codes and what new theme should be confirmed as a new FUAD principle. By the end of this stage, the

demarcation of themes became clearer in terms of the expansion of initial FUAD principles and the addition of a new principle. For example, the emerging codes under the theme of ‘Access to technology’ included access to support (digital literacy support and other, non-digital, skills support). This led to expanding the theme of ‘providing access to technology’ to ‘providing access to technology and any underlying skills needed for that particular assignment’. This, in turn, led to the refinement of the sixth FUAD principle, changing it from ‘access to technology’ to ‘access to technology and skills support’.

Phase 6: Producing the report

The final report is the written account of the data story. In this account, the merit and reliability of the data story need to be evident through data extracts and coherent and convincing articulation of the arguments that demonstrate the prevalence of the themes.

In this research, the interview transcripts were coded based on the pre-set codes and the emergent codes (Figure 4.3), then quotes were collected together for each code. However, in order to offer a coherent narrative that tells the story of the data, some quotes were selected and presented verbatim, because they gave a representative view, or a clear and concise point, while others, initially more lengthy, were summarised and narrated (with reference to the interviewee) as part of the argument.

As mentioned earlier, the phases were not followed in a linear way; rather, a back-and-forth movement between the phases would be a better description.

4.2.4. Reliability, reflexivity, and triangulation

In this study, there were a number of steps taken to ensure reliability through triangulation of data. However, as with any study, some steps were not possible due to circumstances relevant to particular places and institutional restrictions. Clarke (1990) explains that evaluators work under many restrictions, including research budget, time limit, minimising disruption of programme activities, as well as critical and political factors to take into consideration. To compensate any possible limitations that may arise from doing research under such restrictions, steps were taken towards triangulation of the data in an attempt to increase the reliability and validity of the study.

Clarke (1999) discusses the four types of triangulation by Denzin (1970) which are data, investigator, theory and methodological triangulation. Data triangulation involves the creation of multiple data sets collected by employing one or more methods at different times. In this study, two methods were used, interviews and document analysis, and multiple data sets, as each assignment constituted a data set of interview data and documentary data. Data sets were collected in different contexts (different universities, different countries, different departments and different levels of study) as explained earlier. Another type of triangulation, theory triangulation, “entails making use of a number of alternative or competing theories in examining the data” (p.86). An argument could be presented here that FUAD, the driving conceptual framework for this evaluation, is a synthesis of two theoretical concepts and a practical strategy, namely, flexible pedagogies, ubiquitous learning and device neutral assignments. Therefore, the theory in this theory-driven approach to

evaluation is based on two alternative theories and one practical strategy.

The third type of triangulation attempted in this study is methodological triangulation, particularly a 'within-method' approach. This approach entails "applying the same method on different occasions by using multiple techniques within a given method" (pp.86-87). The interviews were conducted in a number of ways; face-to-face, telephone, video conference, in the office during work hours, twice at home and twice in coffee-shops. In some cases, email exchanges took place after the interview when data analysis was shared for confirmation and for the purpose of suggesting improvements. However, the investigator type of triangulation was possible only partially, as this is a doctoral study and is the sole effort of the researcher. Other researchers could not be invited to evaluate the same assignments. Having said that, two researchers were invited to evaluate the FUAD framework itself. A professor in educational technology and an assistant professor in education reviewed the FUAD conceptual framework and gave positive feedback on it, along with some suggestions to clarify a few points. This adds to the reliability of the evaluation tool itself.

Moreover, special attention was paid to validity, reliability and objectivity, as Gray (2004) points that these are areas of concern with evaluation research. Gray explains that the researcher needs to approach the evaluation with an open mind and without any preconceived ideas due to the possibility of interference by the researcher's own values. Therefore, it was important that I should bracket my own values and evaluate the process based on the lecturer's intended outcomes and the FUAD principles through continued

reflection and checking, and through sharing analysis with interviewees as mentioned above.

Other considerations relate to the lecturers' (interviewees') different conceptions of learning and/or designs as well as their epistemological positions compared to that of the researcher. Such differences in position were noted in the interview and throughout the analysis. It was framed as the underpinning philosophy for certain design elements that limited or enhanced the assignment design.

Gray (2004) adds the problems of how honest the participants may be and how self-reflective as this may influence the data. He continues to point out the question of how sufficient the number of indicators is. However, in this research, the interviewees were approached informally. They were not contacted on behalf of any institution or administration. It was made clear that what they would share would be for the purpose of this doctoral research with no consequences on the lecturer's own career. In addition, the interviewees were made aware that the information they provided would inform and add to the formation of the FUAD framework and could possibly lead to future joint research, if they were interested. However, interviewees did not have prior knowledge of the FUAD framework, so their information could not have been tailored to fit the framework. They were only informed that this research aimed at investigating how lecturers design assignments and learning experiences.

4.3. Summary

The chapter details the pragmatic design adopted for this theory-driven evaluation research. A non-probability, purposive sample was used to identify lecturers who had designed TEL experiences. Data collection was in the form of sixteen semi-structured interviews to discuss assignment designs from a variety of universities in different countries. Assignment documents were also analysed. Data from both sources was coded thematically. Finally, the chapter concludes with a discussion of research limitations.

Chapter 5 Findings

In this chapter, the results of the empirical data collection will be given. Sixteen assignments will be discussed with relevance to the seven FUAD principles. Assignments are grouped into eight groups, one group for each FUAD principle and the final group is for technical and procedural assignments that show lack of flexibility. Although each assignment will be discussed in terms of all 7 FUAD principles, one of the principles will be highlighted as being significant, either because it is exemplified well or because it is absent; and the effect of its absence is discussed. Some assignments (subsections 5.2.2. and 5.6.1) have been modified based on the results of the evaluation and the modifications have been implemented and lecturers' feedback is included within the same section. Suggestions were also made for a number of other assignments; some have been accepted and lecturers mentioned that they plan to implement these (subsection 5.1.2). As for the other assignments, the lecturers showed interest in the suggestions and mentioned that they would think about them further.

5.1. FUAD principle 1: Allowing choice of product, tools and procedure

In this section, two assignments will be discussed as illustrative examples of FUAD 1. Evidence of the remaining principles will also be discussed. The third year Smart Object Prototype assignment and the DAL project both show different ways of allowing choice. The former allows choice in product, tools and procedure, the latter restricts the product but allows choice of resources, tools and procedure. A proposal for re-designing the DAL project was

presented to the lecturers upon their request. The suggested changes were based on the FUAD framework.

5.1.1. Smart Object Prototype

5.1.1.1. General description and evaluation of FUAD principle 1

This coursework is a requirement of the Emerging Technologies in Practice module for first year under-graduate students in the School of Computing. Students consolidate the knowledge they acquire during the first six weeks of the module. They learn a number of procedures related to technology and then they integrate these procedures into the design and implementation of a project worth 80% of the module grade. The result is a prototype of a smart home or factory application that benefits from the smart technology being learned in the module. They are also required to produce a video that documents the process of creating this project and give a presentation where they showcase the prototype.

Six of the seven FUAD principles are strongly evident in this assignment. However, it was chosen as a clear example of FUAD 1. The remaining FUAD principles are also assessed and discussed briefly.

Elements of creativity are encouraged in this assignment through high flexibility, as students are instructed to be future facing and reimagine scenarios for currently existing smart solutions. The whole assignment design allows for creativity, innovation and the re-thinking of alternative scenarios.

There is flexibility and freedom for students to allow the production of diverse products.

> “They [students] might come up with a great idea or great product that we didn’t give as a potential project. If they’re confident enough to do that, why not? Maybe their product will be actually later used somewhere.”

Students have the freedom to choose the product of their project. The assignment instructions provide a list of suggested projects. However, students can suggest their own projects from outside of the list. They are also free to choose the procedure.

> “So in here [the project], we don’t guide them through a process, we leave them free… sometimes different groups have different methods of doing it”

Students are also free to choose their own tools in terms of the required project equipment (other than, or in addition to, the ones provided for them).

> “The ability to video the work (cameras and phones work if there is good light and the phone is held steady)” (Assignment Instructions)

Or they can choose any software for photo-editing, video-recording, or presentation software.

> "We advise them to pick [a software]. For example, we tell them these are the things that have been installed in our labs like Photoshop. You could use Photoshop but if you prefer later on when you're doing your image editing or for video editing any other photo software, we are fine with that."

Allowing such choice enables increased student agency and empowerment. It aligns with flexible pedagogical idea 1 of allowing co-creation of knowledge and redefining power frames. It also demonstrates flexible pedagogical idea 4 of increased learner agency and competence, and showcases transformative capabilities. Allowing choice also allows ubiquitous learning through broadening the range and mix of representational modes and enhancing 'higher-order abstraction and metacognitive strategies' (Cope and Kalantzis, 2010).

5.1.1.2. Assessing the remaining FUAD principles

Table 5.1. presents a summarised evaluation of the remaining FUAD principles and Figure 5.1 shows the marking scheme in the assignment instructions.

FUAD Principles	Assessment
FUDA 2: Co-construction of success criteria	The marking scheme is based on technical aspects and innovation (Figure 5.1) and focuses on functionality, achievability and feasibility Criteria in the form of guiding questions – no grade descriptors No student input
FUAD 3: Generic description	Generic project description – focused on outcomes and functionality of prototype One specification is mentioned: to upload the video to Youtube.com – lecturer clarified that any other platform is equally acceptable

FUAD Principles	Assessment
	Comment: Specifications as such are to be avoided, particularly when the lecturer does not mind the use of other platforms. FUAD 3 ensures that there is no unnecessary subscription to any particular technology or platform.
FUAD 4: Agnostic services	Software offered to students cater for all devices – e.g. Photoshop, Windows Movie Maker (for Windows devices) and iMovie (for Mac users). *"The most important thing is to understand the process of photo and image and video editing. Not the software."*
FUAD 5: Social, collaborative, knowledge construction	Group work – peer learning – networked learning: Students are encouraged to look at different innovations from previous students as well as from public Internet sources. They are also directed to refer to reliable sources that indicate where innovation is heading such as the Gartner's Hype Cycle (Gartner Inc., 2019). Purposeful grouping of students to enable collaboration and knowledge sharing and division of tasks based on individual skills. *"Usually I advise them not to work with friends, but to look at their skills before they start this project and I assign in each group a project leader who knows programming. […] I try to put them together, the weak with the strong so that they can learn from each other."*
FUAD 6: Accessibility to technology and skills support	Specialised tools such as Arduino kits and sensors are provided for students Digital skills support is also incorporated within the module *"Media literacy is done in the first two weeks, which covers basic stuff and Photoshop, Photoshop video making and audio."*
FUAD 7: Authenticity and situated learning	Students must link the project and type of innovation to the Skills Framework for the Information Age (SIFA) (SFIA Foundation, 2018) and Gartner's Hype Cycle (Gartner INC, 2019) to ensure project is in line with current trends and expectations of the job market

Table 5.1 Assessing the remaining FUAD principles in Smart Object

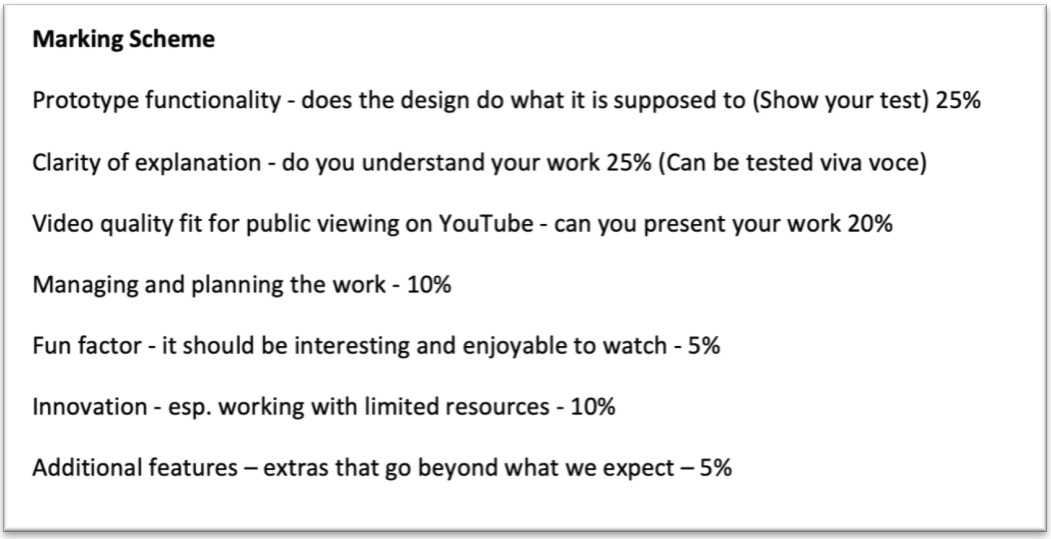


Figure 5.1 Emerging Technologies in Practice (Assignment Instructions)

5.1.1.3. Enablers and inhibitors

Two enablers were identified. The first is linked to FUAD 5, social collaborative knowledge construction. The lecturer identified how students are benefiting from shared, open source innovations on the Internet.

> "if they are doing something which is really smart and innovative and they need something like an algorithm that they don't know how to build. If they go and research this algorithm and find something that is actually open source, they could use it as long as they reference it and integrate it into their products. And this is what makes their product distinguished from the others. This is learning. You don't have to do everything from scratch."

Another enabler is linked to FUAD 6 which is providing access to technology and skills support. The tools and the laboratory environment provided for students enable them to work productively.

> “First, they have access to the resources for example the Arduino kits, the sensors, you know.”

> “The tools they need are available. The software, we have it available and we are using open source so they can download these tools or software to their own computer and work outside.”

This particular point of providing tools and skills support used to be an inhibitor in previous years but it was addressed and the lecturer reported that it has a positive effect on a student’s performance.

On the other hand, group work, which was identified as an enabler, was also identified as an inhibitor. The lecturer commented that some students may depend on others to do the work or only get involved in part of the work. Such students would still get a pass grade even though they may not be able to deliver a project on their own.

> “a student who’s mentally set that he doesn’t want to work on this assignment. When he is in a group, he might actually do a bit of contribution on the design, prototype, might skip coding and provide the feeling for the lecturer and for the other students that he participated.”

5.1.1.4. Suggested improvements to the assignment

The assignment shows evidence of all the FUAD principles except FUAD 2. The improvement suggested is to develop the marking scheme into a rubric with clear success criteria and to gain students' input in that regard. Co-construction of success criteria can be done in a number of ways, as discussed in chapter 3 and in section 5.2.

5.1.2. DAL project

5.1.2.1. General description and evaluation of FUAD principle 1

Basic Human Anatomy 1010 is a first year, pre-requisite course to a number of medical related specialisations. The main characteristic of this course is that it is open for a large number of students (around 1,000 annually, approximately 500 students per term). The course is available for in-class students as well as online students; hence, it is structured as a set of face-to-face lectures that are also made available online for distant students. Students must complete a number of weekly quizzes of multiple choice questions based on the topic of the weekly lecture. The module requires students to attend - or watch - the lectures, answer the weekly assignment quizzes, and take three midterm examinations and a final examination.

Within this highly structured course, the lecturers considered ways to bring the students together by adding a blog, a discussion board and an additional optional group assignment, which is the DAL project (Digital Anatomy Learning project). It is a group assignment where students choose any topic related to

the course content, and create a 5-minute video about it. Grading the project is in two stages; stage one is when all students are invited to vote on the submitted videos, and stage two is when the top six videos will enter a final competition judged by the anatomy lecturers and awarded a grade out of 5 points based on a pre-set rubric. This means only the finalists will be awarded a bonus grade based on the marking rubric.

The lecturer reports that neither the discussion board nor the DAL project, being an optional assignment, achieved its purpose. Not many students participated in them. In fact, out of a class of 815 students, only 9 students responded and created videos. The lecturers are interested in investigating ways to integrate this assignment into the course and are looking at the reasons why it was not picked up by students and how it can be advertised better in the future. The lecturer also reported receiving emails from students inquiring about the video project, mainly asking if it was obligatory to participate. The project failed in engaging student participation although it provides opportunity for some creative group work.

Students are allowed to choose the topic and the sources but the product is specified to be a video. The choice of topic is left entirely to students to help them engage with course content. The instructions clearly state that.

> "**You choose the topic** (allows you to become invested, relate to your own experiences and interests)." (DAL project instructions)

The students are encouraged to be creative as the instructions state that they should create a video using any means of their choice.

> "create a **5-minute** anatomy video production (acting, drawing, singing limericks, reports, comparisons… etc.)" (DAL project instructions)

The examples given in the instructions are not limiting and show flexibility in accepting different modes. It is clear that students are free to create the video whichever way they want. As for the format, the instructions clearly allow choice but with the condition that it should be:

> "compatible with popular media players (MPEG preferred)." (DAL project instructions)

Students are allowed to use their own preferred tools, hence enabling a more democratic approach to the project. However, the specification of a video is the only way in which students are restricted. The aim of the project is to:

> "promote learning anatomy and knowledge retention, and to foster teamwork and communication skills through interactions with classmates." (DAL project instructions)

This, along with the invitation to students to be critical, aligns well with flexible pedagogy idea 4 which is developing transformative capabilities by using critical reflection on the course content that may lead to creating alternative schemes (Ryan and Tilbury, 2013). This may be possible through transforming

textbook knowledge to a visualised, more engaging format that shows the student's own interpretation of the knowledge. The project also aligns with UL (Cope and Kalantzis, 2008) in that it broadens the range and mix of representational modes.

5.1.2.2. Assessing the remaining FUAD principles

Table 5.2 presents a summarised evaluation of the remaining FUAD principles and figure 5.2 shows the marking scheme in the assignment instructions.

FUAD Principles	Assessment
FUDA 2: Co-construction of success criteria	Evaluation rubric contains 4 categories: 1. message, content and quality; 2. message impact, 3. audience fit; and 4. technical aspects: visual and sound. No student input in marking scheme (Figure 5.2). Students evaluate each other's videos by voting on videos they liked. Comment: Voting on videos is not the same as co-construction of success criteria. Yet, it could indicate some student involvement in evaluation.
FUAD 3: Generic description	Generic description – clear requirements – no limiting specifications e.g. "*5-minute anatomy video production using current media and social technologies and the best (free) movie making software for Microsoft or Mac."*
FUAD 4: Agnostic services	Agnostic platforms and tools are suggested, e.g. youthbe.com, creatoracademy.youtube.com, and filmora video editor.
FUAD 5: Social, collaborative, knowledge construction	Group work project – no purposeful grouping: lecturer explained difficulty of interfering with group formation due to the mix of local and distant students and lack of social interaction with students. Comment: this is a limited view of purposeful grouping – see Table 5.3 for FUAD 5 related suggestion.
FUAD 6: Accessibility to technology and skills support	Lecturers assume all students have access to devices and technical support is provided through web links to university help desk and to video creation and editing website. Students have access to the anatomy museum (AM) where they can find materials to make the video about Comment: AM is not mentioned in the project documents - not all students are aware of the possibility of using the museum – distant

FUAD Principles	Assessment
	students cannot benefit from it unless one group member is situated within campus.
FUAD 7: Authenticity and situated learning	No requirement that the video should be authentic or situated Project aims to build skills needed for future career: "*The goal is to help you become more creative, critical and collaborative, which will benefit your career*." (DAL project instructions)

Table 5.2. Assessing the remaining FUAD principles in the DAL project

Criteria	Level 4	Level 3	Level 2	Level 1
Message Content and Quality	Content imaginative and original work that could be used in anatomical education	Content is appropriate and grammatically correct. Easy to listen to by introductory student audience.	Content appropriate but could use more focus and precision. Narrative tone could be improved.	Content unclear and incomplete. Many errors and lacks accuracy.
Message Impact	An original, unique and imaginative approach. Creates a compelling sequence that is correct and informative.	Video gains attention and uses audio and video technique to reinforce the content.	Helpful and informative not a good learning tool.	Video lacks clarity and precision. Message has low impact on learning issues.
Audience fit	Video content show high level of insight into the class. Message is informative, attractive and entertaining.	Message is appropriate; but the flow of objectives is not attractive to a wide audience.	Some good examples but not all inclusive.	Shows little insight into this type of audience. Message is not inclusive or appropriate.
Technical aspects: visual and sound	Video is skilled and sound is linked, professional quality.	Video and sound suitable organization. Well composed and focused.	Video and sound is mostly good but could use improvement.	Video has aspects that hard to watch and may incline audience to quit before it is completed.

Figure 5.2 DAL project grading rubric

5.1.2.3. Enablers and inhibitors

The earlier-mentioned anatomy museum is considered by the lecturer as an enabler. It can be a suitable setting with relevant resources and to help students with the content of the video. Therefore, it provides support for students in creating the video (FUAD 6). Nonetheless, in my view, what might be inhibiting student participation in the project is the fact that the project is optional and is worth a maximum of 5 grades awarded to the finalists only. The bonus grade is too small and uncertain compared to the time and effort needed to make an anatomy video. Another possible inhibitor identified by the lecturer is the fact that there are distant students who do not have the chance to become acquainted with each other to be able to work and collaborate together.

5.1.2.4. Suggested improvements to the assignment

The lecturer sought advice and ideas to improve student participation in the project. An online meeting and exchange of emails took place between the anatomy teaching team and myself to further discuss ways of improving response to the DAL project. Table 5.3 lists a summary of the evaluation based suggestions relevant to FUAD principles.

FUAD Principles	Suggestions	Rationale
FUAD 1: Allowing Choice of product, tools and procedure	Allow different products e.g. poster, infographic, podcast, webpage, leaflet, etc.	To utilise the different digital experitese of learners To broaden the range and mix or representational modes To share different representations of knowledge and help students gain important digital skills through sharing expertese
	Create a list of possible topics with well-defined aspects	Adding limits and directions within the flexible choices helps the project to achieve its outcomes because too much flexibility may lead to chaos (Barnett, 2014)
FUDA 2: Co-construction of success criteria	Invite student input in creating the success criteria Develop a shared understanding of the meaning of each criteria	To reach an agreement on how the project outcomes can be achieved through different products and what the evidence of achievments is
FUAD Principle 5: Social, collaborative, knowledge construction	Group students purposefully (e.g. according to chosen topic, type of product, preferred software, technical savviness, academic level, geographic location, etc.) Peer marking of students' projects	To activate peer learning and peer support To enable meaningful teamwork
FUAD Principle 6: Accessibility to technology and skills support	Invite students with advanced digital skills to provide peer support – possibly by activating the discussion board as a platform for support and encouraging students to troubleshoot issues relevant to the project Suggest ways to increase accessibility to the anatomy museum - a group member who is situated in or around campus can film videos inside the Anatomy Museum and share them with distant group members who can add annotations, voice over, or edit in any possible way	Not all students are equally familiar with tools needed for the assignment This is another way of fostering peer learning where students have channels to help each other with issues that may come-up.
General Suggestions	The project becomes mandatory for all students The option could be given to students to do one project instead of any of the weekly assignments. The topic of the project could be the same as the weekly quiz they are skipping	To increase the project value and worth to the students To accept student created knowledge as another means of learning

Table 5.3. DAL project evaluation-based suggestions

The suggestions can be implemented, tested and analysed to evaluate their effect on the course, on student engagement and on final student achievements. Based on feedback from students and from course professors, a second iteration of the project can be designed with modifications based on the feedback and analysis, until a satisfactory, well-researched project design is reached.

5.2. FUAD principle 2: Co-constructing success criteria

The two assignments discussed in this section represent FUAD principle 2 in different ways. The mini conference presentation is an example of how students and module tutors co-constructed the success criteria of the assignment and the rationale behind it. The second assignment, vocabulary video, did not have success criteria but the lecturer adopted the idea and invited her students to co-construct the success criteria and shared her experience about the exercise.

5.2.1. Mini conference presentation

5.2.1.1. General description and evaluation of FUAD principle 2

This assignment is part of the 4002 PGCert HE (Post Graduate Certificate in Higher Education) module, which is the second of three modules of the programme. The assignment is a conference presentation to be delivered in a mini symposium. The topic is about a research idea that is under development. The trainees (who are lecturers) are required to identify and start a change process by thinking reflectively about their practice, identifying an area that

needs development and identifying and experimenting with different solutions. The presentation is around 10 minutes long and should show clear reflective thinking about the practice. This assignment was designed with high flexibility and represents a number of FUAD principles. The most prominent principle is FUAD 2 which is generally difficult to find in assignments.

When the assignment was introduced, trainees were asked to set the success criteria for evaluating the presentations. The instructions given to them were to write 6 or 7 elements that they thought were important to indicate success. The procedure is for students to be put in groups and work together to create the criteria then hand them to the tutors who in turn will invite discussion on the criteria that were created by each group. The discussion should lead the whole class to choose the best criteria or a merged form of all significant elements into one set of criteria that will be used for assessing the presentation.

> "Each group came up with something different and then we just looked at them to make sure that they'd incorporated the key points of quality, but then we gave it back to everybody and said 'OK, now we have 3 or 2 variations. We need one!' […] and what you often end up with is a really thorough assessment criteria that is really good."

One important consideration here is the fact that the trainees are mostly lecturers themselves; hence, they are capable of doing this task. Another reason is that it would help them produce a more successful presentation because they helped determine the success criteria for it.

> “If you’re going to present something and you know the assessment criteria inside out because you’ve written it, you will present something that is really spot on.”

The module tutor continued to explain the importance of involving students in re-thinking the success criteria because such documents are usually inherited year after year and they are often used without questioning. A useful way to determine what is meant by each criterion is to involve the students and arrive at an agreement as to what each element means and what is exactly required.

> “Often, we inherit assignments; we inherit assessments and we just blindly give them out. […] Very rarely do people sit and read it through and actually put themselves in the shoes of the student. So we go through the assessment, and we try to analyse it as to what we think. This is what we want the students to do, but if we were to sit down ourselves and do that assignment, is it obvious from that success criteria what we have to do? And 9 times out of 10 it’s not, because a lot of assignments and assessments are re-used, regurgitated, cut and pasted.”

The interviewee identified another problem with success criteria, which is the problem of perception or interpretation. She mentioned that on several occasions, the assessors in the branch university gave grades based on their interpretation of the criteria but when they sent them for moderation, the moderators assessed based on a different understanding of the criteria. This

means that interpretation may differ from one person to another. Therefore, it is important to agree in advance on what the criteria means and invite the students to give their input on the success criteria that they will be evaluated on to make sure there is a common, shared perspective among all involved: students, assessor and moderator. The lecturer explained that after considerable discussion with programme coordinators in the main campus, they arrived at a decision that for each cohort, the students will be asked to write the success criteria for their own cohort and it would be discussed and agreed upon and then used for evaluating the presentations:

> "We would do it for our cohort and they'll do it for their cohort, but it would still have to contain certain elements. Module tutors had the quality control in the sense that it had to contain x, y, z. But then it was based to the student to determine 'what are we assessing ourselves on,' and it was more about sort of flipping the whole process."

This reflects the earlier mentioned James et al.'s (2002) 'negotiated assessment' and Cope and Kalantzis's (2010) idea of participatory culture where there is a shifting balance of agency and students are involved in the co-creation of knowledge and of success criteria.

5.2.1.2. Assessing the remaining FUAD principles

Table 5.4 presents a summarised evaluation of the remaining FUAD principles.

FUAD Principles	Assessment
FUAD 1: Allowing choice of product, tools and procedure	High flexibility in accepting different products, tools and procedure – no specification of presentation slides. Lecturer's rationale: "*as long as the learning outcomes are met, I don't care how you deliver your presentation*." Examples of submitted products: An audio reflection - a narrative script with a PechaKucha 20X20 style presentation with powerful imagery only – using the famous television show *Game of Thrones* to describe leadership styles in managing the classroom by using pictures of main characters.
FUAD 3: Generic description	Generic description with no limiting specifications – written with the intention of allowing for variation and creativity
FUAD 4: Agnostic services	Services used: Moodle (LMS) and emails – both agnostic
FUAD 5: Social, collaborative, knowledge construction	The purpose behind a 'mini conference presentation' is to enable knowledge sharing among trainees for the purpose of sharing experiences and development plans. The presentation is delivered individually but the preparation is done in groups: e.g. peer feedback on topic, co-constructing success criteria, discussion after the presentation.
FUAD 6: Accessibility to technology and skills support	Trainees often identify that their own digital literacy skills need development. Yet, the programme does not offer support in that area. The lecturer believes there is a need for the development of online 'self-modules' for trainees who think they need them.
FUAD 7: Authenticity and situated learning	The assignment is authentic and situated because it is based on the real-life experiences of lecturers.

Table 5.4. Assessing the remaining FUAD principles in Mini conference presentation

5.2.1.3. Enablers and inhibitors

An important enabler relevant to FUAD 5 is the diversified specialisations of the trainees. It enables forming a shared perspective, discussing woes and worries, finding out that there is more in common than not. It also helps newer lecturers get a better understanding of the practice when more experienced lecturers/trainees share their experiences.

> "Actually, they [trainees] find out that they all have the same frustrations, the same student worries, the same student issues, the same assessment issues. So, for me that is an enabling factor. Just having that shared perspectives and that mutual sort of respect and experiences that come through it. […] For some of the newer lecturers, it enables them to think bigger as well, because you have somebody who is a professor, who's doing the PGCert, or an associate professor that's doing the PGCert."

However, the special nature of the programme requires a special classroom setting that enables the sharing of ideas. The interviewee identified the classroom set-up to be inhibiting to the kind of reflective, knowledge-sharing nature of the programme, particularly because the trainees are lecturers and mostly colleagues in the same institution. Therefore, she feels that a less formal setting would be better.

> **"**It wasn't a conducive environment. We should be in an area like this [coffee shop] in some ways or a lounge area. We don't

have a lounge area where people can sit together and share experiences."

5.2.1.4. Suggested improvements to the assignment

The only missing element in this assignment is the one related to FUAD 6, which is providing skills support, particularly digital literacy skills. This is an area that was identified by the module tutor. Her suggestion of having 'self-modules' in educational technology is an important one. It would make the assignment much more compatible with modern trends in technology, as well as help in equipping trainees with important skills for their educational career.

5.2.2. Vocabulary video

5.2.2.1. General description and evaluation of FUAD principle 2

The task is part of the English Vocabulary course for level 1 foundation students (false beginners; i.e. lowest level of language proficiency). The course is six weeks long and each week a list of 30 words is introduced to students. There are weekly quizzes that students need to take to get their grades. This video task is to get each student to make a short video to explain the meaning of 3 words from the list. It is a formative task and is designed to help students learn and practice vocabulary using multi-modal resources. The video should contain each of the three words, Arabic translation, example sentences and representative pictures, along with background music. After everyone has created their video, the videos are played in the classroom so that all can watch and learn. Some students, however, do not wish to share their videos. In this case, the lecturer views it privately and gives individual

feedback. The intended outcome of the task is to get students to practice the vocabulary through expressing its meaning in different ways. It also integrates the use of technology and offers students an opportunity to practice their words. The lecturer reported that the students generally enjoyed working on these assignments. It was noticed that even students who tend to avoid participation in class have also produced videos where they explained the words and read sentences containing the target words.

> "I would expect that not every student would speak. I had aimed for that but was sceptical about it. I was surprised that all of them tried to do their best in the video. Even those whom I've never expected to do the task. I was very impressed."

The assignment is a formative one and did not have marking criteria. However, the lecturer decided to try the co-construction of success criteria with her students and shared her feedback on the exercise.

Originally, the assignment only had a few requirements to be considered successful. These requirements were: the vocabulary word; the translation; example sentences; representative pictures and background music (optional). They were communicated to students as verbal instructions and written on the class board and on the OneNote file dedicated for this class.

Since it is a formative assignment, the lecturer felt that a rubric for success criteria may not be necessary. The task is a simple one with simple requirements for low level language students. However, the lecturer expressed interest in trying to co-construct the success criteria with her students. She

mentioned that she would try it as an in-class group exercise and report back how it went. Later, she reported in an email correspondence that the students were put into groups and asked to discuss what would make the assignment successful and what evaluation criteria should be considered. Students brainstormed and shared their ideas onto Padlet, an online platform. The lecturer explained the process as follows:

> "Students were grouped based on their language proficiency… I made sure that each group had at least one student who had previously used the software and is familiar with this kind of activity.
>
> Before they started working on their videos, as advised by you, I asked students to brainstorm the success criteria. They were already in their groups. After posting their answers, we discussed what each point meant and why it is important to consider as they create their videos. I then told them that these will be used to grade or evaluate their videos." (email correspondence)

The comments that students wrote were put together in the following table (Table 5.5)

1. Content	a. Number of sentences
	b. Accuracy/correctness
	c. Organisation of ideas
	d. Creativity in showing meaning
2. Design	a. Picture quality
	b. Picture appropriateness (suitability to meaning and quality)
	c. Creativity in design
3. Speech	a. Voice projection
	b. Pronunciation
	4. Overall video quality

Table 5.5. Student constructed success criteria

The lecturer noticed that this exercise increased students' awareness as they were creating the videos. She reported that they performed better than previous times. Having said that, she could not be sure that this improvement was solely due to the exercise.

> "Videos were not evaluated by students. But, they were generally of better quality. One group added more than one sentence. Another group drafted a few sentences for each word and asked me to check it for them. But still one of the groups did not include the Arabic translation for each word (which was one of the requirements). I also appreciated how they tried to use complex sentences, as it is something we focus on a lot in our writing classes.
>
> Although I noticed my students referring to the criteria we set, I cannot, without doubt, say that it was the only possible explanation for this." (email correspondence)

It might be safe to say that since students were seen referring back to the criteria while working on the assignment, this could mean that it contributed to focusing students' attention to the elements that needed to be in the assignment.

5.2.2.2. Assessing the remaining FUAD principles

Table 5.6 presents a summarised evaluation of the remaining FUAD principles.

FUAD Principles	Assessment
FUAD 1: Allowing choice of product, tools and procedure	Product: video only Video production tool: Adobe Spark (free and highly recommended by lecturer) but any other tool is acceptable. Device: Any – laptop, tablet or mobile telephone
FUAD 3: Generic description	Instructions are generic
FUAD 4: Agnostic services	Adobe Spark is an iOS App but can be accessed online from any device Any other video editing tool is also acceptable
FUAD 5: Social, collaborative, knowledge construction	Students work individually for classroom management purposes (to avoid noise and disruption). However, students sometimes request to work in groups. In this case, grouping is done purposefully by assigning a group leader who is a repeating student (one who previously failed the course). Purpose: to use learner differences – to empower the repeating student – to utilise the previous experience of the leader for purposes of providing support to group members.
FUAD 6: Accessibility to technology and skills support	Technology is heavily supported in this particular institution. Students produce digital assignments regularly. Lecturer provides tutorial on Adobe Spark and group leader provides support.

FUAD Principles	Assessment
FUAD 7: Authenticity and situated learning	Due to the nature of the course (vocabulary) and level of students' language proficiency (low), there is limited opportunity for authenticity.

Table 5.6. Assessing the remaining FUAD principles in vocabulary video presentation

5.2.2.3. Enablers and inhibitors

An enabling factor is the fact that students are quite familiar with creating videos as they are avid social media users. They create and share videos on a regular basis, so they have knowledge in editing and sharing videos.

> "They're good at it. If they had not done any videos before, I think they would not have appreciated this assignment. They are extensive users of social media so the idea of creating videos is not intimidating as it used to be before."

The app itself (Adobe Spark Video) may be considered as an enabling factor due to the lack of too many distracting features such as too many font types and sizes. It also has the feature of using slides so that when part of the video needs editing, students do not need to recreate the whole video, they can simply edit or repeat the part that needs re-doing.

In addition to the above, the lecturer explained that the general environment of the institution is led by technology. Technology is heavily integrated in teaching and learning. In other words, the enablers are relevant to the fact that

access to technology (FAUD 6) is provided to students and that has led to students using technology comfortably.

On the other hand, background noise has been identified as an inhibitor. In fact, this is relevant to the classroom setting where all students record in the same place at the same time. Giving students the chance to go outside of the classroom to record does not improve the situation much as the outside spaces are equally populated and background noise is also an issue.

5.2.2.3. Suggested improvements to the assignment

The main suggestion was to get students to work together on creating the success criteria. This suggestion was implemented by the lecturer, as discussed above, with encouraging results. There could be another suggestion to help deal with the inhibiting factor of background noise. A possible solution is to set this task, or at least the recording part of it, as a homework so that students have the chance to find a quiet place to record.

Authenticity (FUAD 7) could possibly be increased, to an extent, if students use sentences from conversations of people, in real life or on television shows, or even possibly from newspapers. This would need a reasonable grasp on the language that enables students to read newspaper articles or watch and understand television shows.

5.3. FUAD principle 3: Generic assignment description

The two assignments chosen for this section represent two different types of assignment instructions in terms of allowing generic choice and flexibility. The listening skills lesson plan instructions avoid any specification of software or platform, provide examples as suggestions only and clearly state that students can come up with their own ideas beyond the given examples. The retail design poster is quite different in that the instructions are specific and details the requirements and the procedure specifically.

5.3.1. Listening skills lesson plan

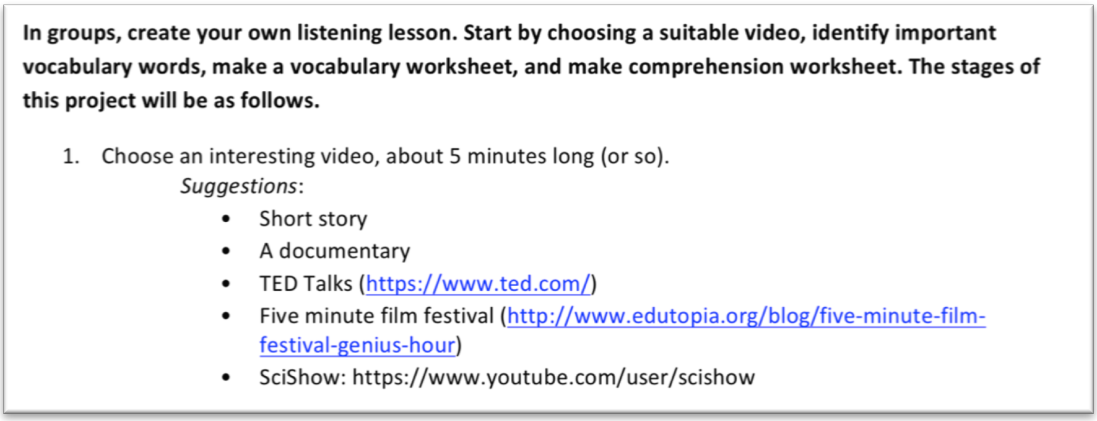
5.3.1.1. General description and evaluation of FUAD principle 3

This is a formative assignment for the Listening Skills course of the Intensive English Language Programme, tertiary level. Students in this assignment are required to plan a complete listening skills class and teach it to their classmates. Listening is a receptive skill and this assignment turns the students' role from passive recipients to active learners. The assignment is in 3 guided stages; finding a five-minute long video from a list of suggested options, designing vocabulary and comprehension exercises around the video, and finally teaching it to their classmates. Students are instructed to make a list of 10 words that may be new to the students, then design a vocabulary worksheet where they write vocabulary exercises. In addition to that, they need to write some comprehension questions to test understanding of the video. The final stage is where they teach the lesson to their peers. The assignment is formative; therefore, no grades were awarded. Students were

invited to vote for the best lesson. The winning group will go on to teach it to other sections of the Listening Skills course.

This assignment is highly flexible and empowering to students. The instructions reflect this flexibility through generic descriptions that do not place restrictions on products or tools. It enables students to be creative in the way they would like to design and teach the lesson.

The instructions are specific in terms of what elements need to be included in the assignment, but generic enough in that it does not specify any tools or types of video. Students are encouraged to come up with creative ideas for language exercises. The instructions clearly state that the requirement is an interesting video without specifying the type of video (Figure 5.3).



In groups, create your own listening lesson. Start by choosing a suitable video, identify important vocabulary words, make a vocabulary worksheet, and make comprehension worksheet. The stages of this project will be as follows.

1. Choose an interesting video, about 5 minutes long (or so).

   Suggestions:

   - Short story
   - A documentary
   - TED Talks (https://www.ted.com/)
   - Five minute film festival (http://www.edutopia.org/blog/five-minute-film-festival-genius-hour)
   - SciShow: https://www.youtube.com/user/scishow

Figure 5.3 Listening Skills lesson plan assignment instructions: Video choice

For the required language exercises, students were instructed to make a vocabulary worksheet without specifying the type of document required (Figure 5.4). Creativity in designing exercises and in delivering them is also encouraged.

5. Make a vocabulary worksheet based on your list. You can choose any type of exercise.
Suggestions: matching words with their meanings, multiple choice questions, Fill-in the gaps questions, crossword puzzles, or any creative exercise you can think of

Figure 5.4 Listening skills lesson plan assignment instructions: Vocabulary worksheet

The instructions give a number of suggestions but clearly articulate that these are not more than suggestions. Creativity is encouraged in many ways. This sets the general direction of the assignment towards delivering the lesson in an engaging way through allowing new ways of delivering information, as will be evident in the following sections.

As can be seen, the instructions show the type of flexibility that encourages students to think of alternative future scenarios, i.e. new methods for teaching listening skills (Ryan and Tilbury, 2013). It also allows for use of different representational modes and embraces learner differences (Cope and Kalantzis, 2010).

5.3.1.2. Assessing the remaining FUAD principles

Table 5.7 presents a summarised evaluation of the remaining FUAD principles.

FUAD Principles	Assessment
FUAD 1: Allowing choice of product, tools and procedure	Product: planning and delivery of a complete lesson Many choices are provided as suggestions only (Figure 5.3) Tools and procedure: Any 5-minute video of interest – no specifications. Examples of different procedures:

FUAD Principles	Assessment
	"They wrapped a paper containing the new word around a piece of chocolate and gave the chocolates randomly to classmates. Then they invited the student who got the chocolate to unwrap it and say the word and try to guess its meaning, generating a discussion about each word. Another group had a video on sea life and distributed little paper boats that had a comprehension question within it. You have those creative students and you have the ones who will distribute a plain document with multiple-choice questions. And that's fine, too."
FUDA 2: Co-construction of success criteria	The assignment was formative – success criteria were deemed unnecessary as each stage was guided by the lecturer to ensure that the final product, the lesson, is correct in terms of language and content *"Students had to get feedback from me, on each stage, before they finalise the lesson plan."*
FUAD 4: Agnostic services	Suggested resources were all web-based. Students were not required to submit their lesson plans in any particular format. Feedback on each stage was given verbally.
FUAD 5: Social, collaborative, knowledge construction	Students chose group members they were comfortable to work with. Tasks were assigned by the lecturer *"There is a section in the instructions that distributes the work among group members to make sure that they all have equal workloads."* Tasks require watching a number of videos and engaging in discussion and negotiation among group members – benefits: develop listening skills, communication skills and increased engagement in the lesson
FUAD 6: Accessibility to technology and skills support	The lecturer provided personalised support for each stage of the lesson plan (content and methodology) – support was not needed in terms of technology. Students used their own devices or the computers in the classroom.
FUAD 7: Authenticity and situated learning	The videos were authentic. "It is important that students are exposed to the spoken language as it is, without modification like what they have in language learning books. That is why I ask them to view general videos and see which ones they are capable of handling or understanding. This particular stage, choosing videos then voting within the group on which one to use, is done for the purpose of exposing students to the language as it is spoken."

Table 5.7. Assessing the remaining FUAD principles in listening skills project

5.3.1.3. Enablers and inhibitors

The lecturer felt that a significant enabler in this assignment was that it was a formative assignment and students were not too worried about losing grades. They were able to be creative and enjoy working on it, if they were motivated enough. As for inhibitors, the lecturer did not feel that there were any.

5.3.1.4. Suggested improvements to the assignment

An evaluation tool could be introduced to this assignment to add a further competitive element. Having students work together with the lecturer to create success criteria would be beneficial in guiding student work and in empowering them since they would already feel empowered as they would be teaching the assignment to their classmates.

5.3.2. Retail design concept and mood board poster

5.3.2.1. General description and evaluation of FUAD principle 3

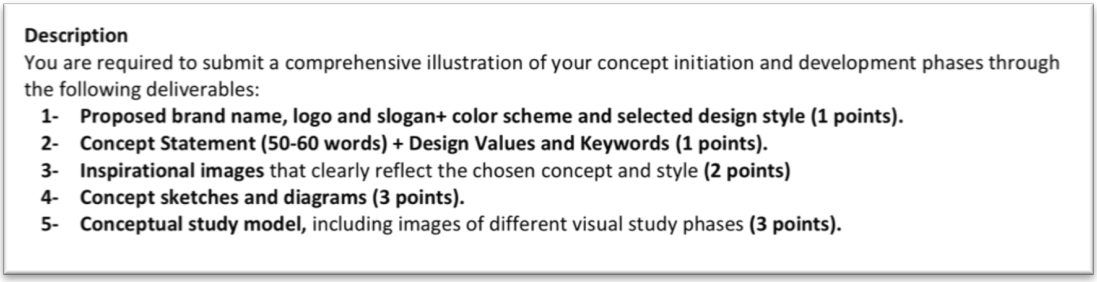
In this third-year integrated design project, students of the College of Fine Arts and Design are required to design a retail store of their choice. They need to create a brand and a concept for the store as well as a colour scheme. Then they should communicate the concept visually and translate it into a design. Students have to design a poster where they tell the story of their design and display their sketches. The poster should include inspirational images, a concept statement and sketches. Along with the poster, students need to apply and test their ideas into a 3D concept model of the store. The assignment is worth 10% of the final grade.

The project is in three phases. The first is a literature search of previous applications and case studies where a similar concept has been implemented. The second is the poster where students visualise their concepts and finally the 3D (three-dimensional) model where they test the design on a small scale. Students are required to submit the poster electronically as a pdf (portable document format) file and another printed hard copy size A3 for grading and feedback and size A1 for display. The 3-Dimensional model is to be attached to the printed poster.

This is an assignment that requires creativity and visualisation but at the same time has a prescribed structure. Although creativity is encouraged, it is encouraged within limits and can be considered as guided creativity. The instructions document reflects that, in the sense that the requirements are mentioned in detail and processes are clearly defined. Instructions are quite specific and the requirements are listed in detail in the instructions document. Lecturers would add extra oral instruction to further detail or prescribe the final product. The lecturer believes that any less detailed requirements might cause weak students to be ‘lost’ or advanced students to ‘go wild’.

The description of the assignment (Figure 5.5) is very specific in terms of procedure and requirements. At first glance, the assignment instructions might show lack of flexibility and guide students into the design process methodically. Although FUAD 3 calls for more generic descriptions and less specifications to enable student creativity, we see the opposite in this assignment’s instructions. The detailed requirements and specifications are for

the sake of guiding creativity. The process is clearly set out for the students but the content of the assignment is where the students show their creativity.

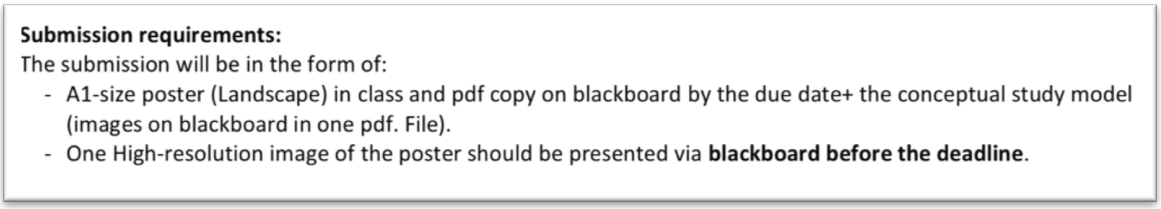


Description
You are required to submit a comprehensive illustration of your concept initiation and development phases through the following deliverables:

1- **Proposed brand name, logo and slogan+ color scheme and selected design style (1 points).**
2- **Concept Statement (50-60 words) + Design Values and Keywords (1 points).**
3- **Inspirational images** that clearly reflect the chosen concept and style **(2 points)**
4- **Concept sketches and diagrams (3 points).**
5- **Conceptual study model,** including images of different visual study phases **(3 points).**

Figure 5.2 Retail design concept assignment description

The submission requirements are equally detailed (Figure 5.3). The electronic copy is specifically required to be in pdf format and the hardcopy must be in a particular size.



Submission requirements:
The submission will be in the form of:

- A1-size poster (Landscape) in class and pdf copy on blackboard by the due date+ the conceptual study model (images on blackboard in one pdf. File).
- One High-resolution image of the poster should be presented via **blackboard before the deadline**.

Figure 5.6 Retail design concept assignment submission instructions

Such detail is viewed as a positive point in the assignment. Clarity is usually appreciated among students. On the other hand, if lecturers are to be strict in accepting only a particular procedure in a particular format, how can students be future facing and reimagine current procedures, particularly when dealing with highly creative disciplines such as interior design? During the earlier years, more guidance may be needed, but in the advanced years, students need to have some leeway to show initiative and distinguish themselves.

In the previous assignment, 5.3.1 Listing skills lesson plan, the instructions also contained a number of details and requirements. However, they were presented as ‘suggestions’ in some places (Figure 5.3) and had notes such as ‘or any creative exercise you can think of’ (Figure 5.4). Comparisons between the two assignments are not entirely correct here because each assignment belongs to a different discipline and targets a different skills set. Nonetheless, a comparison provides a point of discussion to encourage reflection on the learning designs. FUAD 3 is there to prompt lecturers to ask themselves what they really want students to do, that is, learn the process as is, or leave some room for students to be creative and reimagine a new process.

There is a general belief that increasing flexibility and allowing choices may lead to chaos.

> “I think the education system in general is not equipping them with that, with the ‘I’m not limited’ kind of concept. If they feel that they are not limited, the creative ones will go really wild but the others will be lost… But it’s not the case here. The entire culture of the place is not like this. The entire culture of their education and of this college and of this university and the entire culture doesn’t support that.”

According to the lecturer, the students would get lost if there were fewer instructions due to the prevailing educational culture, both in their previous school years and now in the university. This seems to be due to an underlying belief that the university culture, and student culture, is that of structure and

over-prescription. Moreover, the university culture, according to the lecturer, is believed to have a top-bottom approach to authority and would not allow for bottom-up settings where students co-construct the success criteria.

5.3.2.2. Assessing the remaining FUAD principles

Table 5.8 presents a summarised evaluation of the remaining FUAD principles.

FUAD Principles	Assessment
FUAD 1: Allowing choice of product, tools and procedure	Limited choice - product must be a poster: submitted as size A3 printed hardcopy (for feedback), pdf file electronic copy (official submission) and A1 printed poster (for final presentation). Rationale: display area stipulated size of printed poster - pdf is a preferred file type for BlackBoard (LMS) – A3 hard copy is for grading and feedback Tools: Photoshop is recommended but other software is acceptable Procedure: guided with some freedom of work
FUDA 2: Co-construction of success criteria	No student input. Lecturer gave 3 reasons: 1. Students lack the training and the maturity to have input - students' culture and previous educational experience do not qualify them for such input. 2. The university culture is believed to have a top-bottom approach to authority and would not allow for bottom-up settings where students co-construct the success criteria. 3. Success criteria need to reflect course outcomes and programme outcomes: *"The course outcomes and the program outcomes are inherited, we don't have any say in them."* (Link to 5.2.1 Mini conference presentation where lecturer commented on 'inherited' assignment documents)
FUAD 4: Agnostic services	• BlackBoard is web-based and device agnostic • Photoshop and AutoCAD are device agnostic • Computer laboratories have both Windows and Mac PCs.
FUAD 5: Social, collaborative, knowledge construction	Students work on this project individually. The lecturer explained that later projects are done as group work.
FUAD 6: Accessibility to technology and skills support	Students have access to high quality computers: *"there is also a computer lab if they want to have a high-quality render and so on."* Lecturer expressed that the required digital skills for students is currently an area of concern. Skills support is provided, briefly, for the recommended software, within class time.

FUAD Principles	Assessment
	"W*hen it comes to the computer skills which is pretty demanding, it requires a lot of time and one-to-one attention, tutorials, exercises and everything. It's a parallel course! We kind of plug in as much as we can within the time given and that's it."* Lecturer believes that a backchannel of support is required, outside of class time.
FUAD 7: Authenticity and situated learning	Project is situated: Students visit an unfinished retail shop area in a shopping mall and are instructed to base their designs on that area to make the design authentic. *"We usually seek collaboration from large corporations here… they show them a space in progress which hasn't opened yet; they show them another one which is open, and we also use an existing layout of a store to start their design."*

Table 5.8. Assessing the remaining FUAD principles in retail concept design project

5.3.2.3. Enablers and inhibitors

The studio life experience and the one-to-one attention given to students act as enablers. Learning becomes more hands-on with less lecturing.

> "The enabling factor is one-to-one attention, working together with each design situation. We give them this attention. The studio life is that! You don't lecture much."

As for inhibitors, looking holistically at the assignment, it can be deduced that institutional restrictions can act as inhibitors. For example, the lecturer explained the strict requirement that all posters must be submitted electronically onto BlackBoard. This requirement is not compatible with a discipline as creative as design because grading it is not possible through the LMS. Lecturers go around it by asking students to submit a hard copy as well for purposes of grading.

> **“**The pdf is required because they do submit on a blackboard system, and an interesting thing about design discipline is that you cannot really mark on BlackBoard, because you need to adjust lines and add curves and extend a little bit, and slash some part of the space and bring it a little bit here. You don’t tell them well that’s wrong because 1+1=2, you can’t do that. So I ask them for an A3 printout of the poster so I can put all the ideas and sketch over it and return that to them.”

The fact that there are external assessing jury members was identified as an inhibitor. However, the inhibitor here is really the lack of mutually-understood success criteria (FUAD 2). With reference to the discussion of the need for co-construction of success criteria in section 5.2.1. mini conference presentation, the involvement of external examiners in the assignment makes it more important that success criteria are co-constructed. The lecturer mentioned that an inhibitor to student creativity is the fact that the assessing jury members grade the posters through pre-written, outcome-related success criteria which makes grading more prescribed than relevant to real-life situations. The lecturers advise students to follow the same format for purposes of consistency. This makes the students’ work more assessment-based rather than creative.

> “When they present, we kind of put them in the same format for consistency, because we do not grade their final jury. We do not have an exam we have a jury where everybody post there posters and we ask people from the discipline, other than us, to

> join in and grade them. We provide them with the brief, explain what was covered, what was not covered, what we're looking at. We create clear rubrics for them, and we just let them into the room and they ask students all sorts of questions,"

Additionally, not having a system for support puts the lecturer in a situation where he/she has to provide it within the design studio session. This takes up studio time and also makes support sessions short or limited.

5.3.2.4. Suggested improvements to the assignment

Improving the assignment would involve addressing the inhibiting factors mentioned above. Inviting students to participate in a discussion about the success criteria helps in creating a shared understanding of it. Similarly, the external assessors need to participate in the co-construction of meaning of the success criteria. The general feeling here is that there is a strong power distance between the lecturer and the students and there is little attempt to empower students. The institutional restrictions and the overall culture all contribute to the non-acceptance of student participation in simple decision-making procedures such as the co-construction of success criteria.

To address the second inhibitor of providing support, peer learning could be a possible solution. Students who are competent in using certain design software can arrange workshops for peers. This way support can be provided without the need to employ an additional staff member or cut class time for support.

5.4. FUAD principle 4: Platform agnostic services

The two assignments chosen here highlight flexibility. Both endorse an agnostic approach to technology. Both lecturers are IT specialists, hence have a good understanding of the diversity of devices students use and the different tools and software compatibility issues, and have taken that into consideration in the design of their assignments.

5.4.1. App design

5.4.1.1. General description and evaluation of FUAD principle 4

The App design is a multi-phased coursework assignment for third (final) year students studying a Human Factors in Design module. This coursework is long, detailed, advanced and relevant to the job market. It is worth 100% of the module grade distributed between group presentations (30%) and individual reports (70%). It is very similar to what students will be doing after graduation. The three phases of the coursework, and the fact that it is a combination of group work and individual work, makes it quite similar to what happens in industry. Moreover, students are encouraged to choose a real-life, authentic situation and design an app for it. This involves three phases: doing user research; prototyping; and evaluating.

Most of the FUAD criteria are clearly present in the coursework except for the co-creation of success criteria. However, it was chosen as an example of FUAD 4 because it shows how services and tool choices were made based on how agnostic they are. Any technical issue that resulted from such choices

was dealt with through providing a suitable alternative. This represents a dynamic and flexible pedagogy on the part of the lecturer.

In order to implement the design of the app and to test its interface, students need to use a wireframing tool. Two tools were recommended to students; one was Balsamiq and the other was JustInMind. They were purposefully chosen due to their agnostic nature so that students can use them regardless of what device they have.

> "We wanted to choose a tool that is available on Mac and on Windows, and that's why we reviewed three or four prototyping tools and we came to a decision that Balsamiq is a good tool. And so is JustInMind"

Sketch, a recognised powerful software application, was not chosen because it operates on Mac computers only. Although some students use Mac computers, the university computer laboratories did not have Mac computers.

> "when we looked at the market and saw that there are new tools that are being used with practitioners that are working in UX and interaction design. One of the tools that was very popular is Sketch, but we didn't use it because we don't have Mac devices here."

This is in line with Reid and Pechenkina (2016) and Pachler, Cook and Bachmair's (2010) idea ensuring agnosticism due to how students tend to work through an ecology of various devices that should all be enabled without

subscribing to a particular type or brand. Removing any such limiting specifications contributes to the decolonising of education (Ryan and Tilbury, 2013).

Another important consideration for choosing the software was the ability for collaboration.

> "We want student to collaborate on this tool. It's not just one student goes and prototypes everything. So they create their accounts on the cloud and accordingly they log in. They see their projects and each one can design something, like a screen, or the homepage. Another one will design something else…"

This is to be taken in the light of how students do not use one particular device but work within an ecology of devices (Reid and Pechenkina, 2016; Pachler, Cook and Bachmair, 2010) that could be of different operating systems or specifications. By doing so, the notion of control is dismissed, because requiring a particular device-specific app or software means subscribing to or accepting the ideologies of the makers/creators of that device, as explained earlier (in section 2.3.1. Issues with Device Control).

5.4.1.2. Assessing the remaining FUAD principles

Table 5.9 presents a summarised evaluation of the remaining FUAD principles.

FUAD Principles	Assessment
FUAD 1: Allowing choice of product, tools and procedure	Product: 8 App ideas are suggested to choose from but "*you can do one of these or something else*". The idea/topic "*could be anything, but make sure it has scope for a reasonable level of complexity*" (Assignment Instructions) Tools: Any software for presentation and report – Balsamiq and JustInMind (recommended) PowerPoint and paper sketches (allowed but not recommended – reduces grade) Procedure: three fixed stages - user research, prototyping, evaluating – to train students on current procedure in industry – the same case as in assignment 5.3.2 retail design concept.
FUDA 2: Co-construction of success criteria	No student input in official marking scheme. However, students learn to evaluate and practice by peer evaluating apps: "The other way, we call it expert evaluation, and they do it with two or three experts. […] I'll tell them, now, the other group have learned about evaluation, evaluation techniques and all of that. Go ask the other group to do expert review for you." Students choose their evaluation criteria from Nielsen's 'top 10 Heuristics' and from Shneiderman's 'golden rules' and ask their peers to evaluate using the chosen criteria – this is for peer evaluation only because grades are awarded based on a list of requirements for each phase, weighted and documented in the instructions document.
FUAD 3: Generic description	General descriptions to allow choices of product and tools
FUAD 5: Social, collaborative, knowledge construction	Purposeful grouping – each group must contain students from the same department and students from another department because those from the same department are more familiar with some required topics, dynamics of group work, and report writing and can help the other students catch up. Lecturer assigns roles, group members decide who takes which role based on skill-set of each student.
FUAD 6: Accessibility to technology and skills support	All required software are provided – the lecturer provides tutorials on each software

FUAD Principles	Assessment
FUAD 7: Authenticity and situated learning	Students research 'real personas' or real 'user stories' based on real-life situations in the student's own context. Students use the same software used in industry and get expert evaluations from real companies due to alliances and cooperation between the department and some IT companies.

Table 5.9. Assessing the remaining FUAD principles in app design project

5.4.1.3. Enablers and inhibitors

An important enabler in this task is providing platform agnostic tools (FUAD 4). It allows students to collaborate on the assignment using their own devices. However, the assessment of the project has been identified as an inhibiting factor. This is because if the first phase of the coursework is not done really well, then the other two phases will not be assessed highly because they would be based on the first phase. However, there is no intention of changing this pattern because it mirrors what happens in industry.

5.4.1.4. Suggested improvements to the assignment

There are two suggestions that can be made here to improve the assignment and make it more FUAD compatible. The first is related to FUAD 1 in terms of encouraging students to re-imagine current scenarios and procedures. For example, an extra bonus grade could be announced and awarded for students who can come up with an innovative topic and different procedure; i.e. to those who think outside of the box and re-imagine how the same task could be done differently. This would be somewhat challenging as it would require the lecturer to accept differences.

The second suggestion is related to FUAD 2 and the co-construction of success criteria. The process of peer evaluation and the process of formal assessment could be done using the same agreed-upon criteria. Students are using authentic evaluation criteria such as Nielsen's 'top 10 Heuristics' and from Shneiderman's 'golden rules', but there could be a merge between the criteria that the students use with the criteria that tutors use. Such a merge could be negotiated with students and a final set of criteria could be agreed upon and used for peer evaluation and formal tutor assessment.

5.4.2. Arabic language integrated assessment

5.4.2.1. General description and evaluation of FUAD principle 4

This summative assignment is worth 20% of the course. It is designed to assess students' progress in the Arabic as a Second Language course. The course is taken by students from different specialisations. They are required to write a 500-word essay on any controversial topic that is facing Egypt nowadays. They are also required to produce an infographic to summarise the essay in a way that enables understanding of the issue without having to refer back to the essay. The third requirement is to record a video where the student interviews people about the same controversial issue they chose to write about in the essay. The three requirements test students on their writing, speaking, listening, comprehending and summarising skills. The assignment seems well-rounded and targets the skills that should have been acquired prior to the mid-term assessment.

The students are ‘tech savvy’ with no noticeable issues in technology as the assignment is not different from the various class activities that were carried out in the class.

The assignments are recommended to be done on Google Drive due to easy access and sharing capabilities as well as being device agnostic.

> “For writing the essay, they can use Google docs, or just use Microsoft Word. They can do so. And for the infographic, I told you they are using Google Slides. I asked them to do an infographic before, so they know how to use such tools. For the video they already know how to record with their mobile phones. So regarding technology. No problems! They can also send me a Word document. I don’t mind anything.”

It is clear that the lecturer accepts any other tools. She mentioned that some students opt to use more advanced software for the creation of infographics.

The kind of flexibility used here is a mix between having an agnostic set of services recommended to students along with flexibility to accept any other tools. Students can choose to do what enables them best to express their learning.

5.4.2.2. Assessing the remaining FUAD principles

Table 5.10 presents a summarised evaluation of the remaining FUAD principles.

FUAD Principles	Assessment
FUAD 1: Allowing Choice of product, tools and procedure	Product: essay, infographic, and video - students choose the topic Tools: Google Docs and Google Slides are recommended – other tools are also acceptable.
FUDA 2: Co-construction of success criteria	No student input – the lecturer argued that students lack the required maturity and motivation because they do not take this course seriously. *"Students are still not mature enough in my own point of view. […]. For example, a student from Petroleum Engineering or another from Graphic Design or from Psychology, they don't take Arabic seriously at all. If I allow them to put the rubric by themselves, it will be a mess in my point of view, because they don't care about the subject itself."* Focus of the criteria is on language outcomes
FUAD 3: Generic description	Instructions are mentioned with enough generalisability to allow choice of tools as these are not specified in the description
FUAD 5: Social, collaborative, knowledge construction	Individual work – the lecturer explained that students need to be assessed on their acquired language skills individually. Other formative assignments are done as group work. Social knowledge construction is being achieved through communication between students and people they interview for the video. *"I want them to know the points of view of different people regarding their topic and their stance from the topic itself and to gain more knowledge from talking to other people regarding the same topic."*
FUAD 6: Accessibility to technology and skills support	The class environment is well supported by technology. There is a computer for each student and high speed Internet connection. Technological and digital support is embedded – the lecturer has a degree in computer science and provides support for students.
FUAD 7: Authenticity and situated learning	The topic must be authentic and related to any controversial issue facing the country. The language practice is authentic and situated as students are required to discuss the topic with people outside of the classroom and record their points of view.

Table 5.10. Assessing the remaining FUAD principles in Arabic language integrated assessment

5.4.2.3. Enablers and inhibitors

Access to technology and the embedded support to students were both identified by the lecturer as an enabler. This is relevant to FUAD 7. However, the lecturer identified one weak point in relation to this assignment; this is students' typing skills in Arabic, but this slight setback they catch up quickly with.

5.4.2.4. Suggested improvements to the assignment

The only missing principle of this assignment is FUAD 2. Context and culture were flagged as factors that determine the possibility of inviting students to co-construct the success criteria. However, the lecturer did not clearly state in which sense culture and context play a role. Students could be invited to discuss the marking criteria and agree to what it means to them and how each criterion can be achieved. This way, the students participate in creating a shared understanding of the success criteria.

An additional layer of support could also be provided. There could be a list of suggestions of reliable sources such as articles, documentaries, lectures, videos, etc. Students may need some guidance in terms of where to look for information.

5.5. FUAD Principle 5: Social, collaborative, knowledge construction

The poster assignment discussed below is characterised by its social collaborative knowledge construction through the groupwork that takes place. Students have been purposefully grouped in a number of ways. The lecturer reported several ways of grouping students and how that enhanced students' learning.

5.5.1. Public area design concept and mood board poster

5.5.1.1. General description and evaluation of FUAD principle 5

This assignment is very similar to assignment 5.3.2 retail design concept and mood board in that it is for third year students of the College of Fine Arts and Design in the Design Studio Course and is worth 10% of the total course grade. It involves producing a poster that shows the design of a space. Students start with research, then a mood board, and finish with the layout. This time the work focuses on an area in a public building and is done in groups. The same process applies as in assignment 5.3.2 and the same restrictions on the final product for the same reasons (as it is in the same institution). Institutional and cultural restrictions prevent lecturers form providing more flexibility and choice for students even though the discipline requires fostering creativity and innovation. The strongest element in this assignment is the collaboration between students. The lecturer experimented with many purposeful grouping methods to find the best way that enables teamwork among students.

> "We tried many things, so it's never fixed. Sometimes we let them choose; we sometimes go strictly with our choices."

When students were allowed choice, some problems arose, as can be the case with groupwork. Some students started to complain about other group members who disagreed with them. To avoid this, the lecturer decided to group students based on their level and skill-set while at the same time allowing some choice. The lecturer explained as follows:

> "Being self driven; motivation as apposed to the lazy student who has some idea but she's just relying on others, waiting for somebody else to do the job."

As an example of that, the lecturer mentioned how she changed the group of one student because she felt the students needed motivation and challenge.

> "I group them based on their motivation and educational skills, and sometimes I put them where they need to develop a particular skill. And there was someone whom I took out of the weak group and put her in the top group because she's talented but she doesn't have the motivation; she has the idea and the potential but the weak group wasn't getting out the best from her."

This year, the lecturer asked each student to write the names of three other students they wished to work with and they were promised that they would be put in a group containing at least one of the three named choices. The lecturer

noticed that most students wrote the same names of the five smartest people in the class because they wanted to work with them.

> “We broke them down to 5 groups. We picked the top 5 as leaders of each group, separated them and then we started matching [the rest of the students] according to their choices of names.”

The result was in line with how the lecturers wanted the groups to be formed, with mixed ability groups to enable peer learning.

There are some other considerations when grouping students, such as where students live, because they will need to work outside of the classroom. Another consideration is gender issues as some students are not comfortable working with the opposite gender due to cultural restrictions.

> “a variable that should be taken into consideration is for example, who’s staying in the dorm and who’s outside, who has a problem with girls and boys (gender issue) and who doesn’t. There are so many considerations.”

Collaboration is not only enabled within groups and among students, it is also enabled with real clients such as a local museum or the university student centre.

> “We take a real-life problem in collaboration with a bigger entity like the university, Sharjah museums, we collaborate with them

and then we use the purposes that they want to achieve in their buildings as drivers for the project"

Thoughtful consideration is put into how students are being grouped which shows the importance of collaboration. This reinforces the idea of distributed cognition (Cope and Kalantzis, 2010). It also maximises collaboration and shared perspectives (Ryan and Tilbury, 2013).

5.5.1.2. Assessing the remaining FUAD principles

Table 5.11 presents a summarised evaluation of the remaining FUAD principles.

FUAD Principles	Assessment
FUAD 1: Allowing choice of product, tools and procedure	Limited choice - product must be a poster: submitted as size A3 printed hardcopy (for feedback), pdf file electronic copy (official submission) and A1 printed poster (for final presentation). Rationale: display area stipulated size of printed poster - pdf is a preferred file type for BlackBoard (LMS) – A3 hard copy is for grading and feedback Tools: Photoshop is recommended but other software is acceptable Procedure: guided with some freedom of work
FUDA 2: Co-construction of success criteria	No student input – (the same reason as assignment 5.3.2) Student lack of training and maturity – university culture – assignment documents being fixed or 'inherited'
FUAD 3: Generic description	Prescribed and not generic due to institutional requirements and procedures
FUAD 4: Agnostic services	• BlackBoard is web-based and device agnostic • Photoshop and AutoCAD are device agnostic • Computer laboratories have both Windows and Mac PCs.
FUAD 6: Accessibility to	The University provides access to high quality computers Digital skills support in brief and embedded within class time

FUAD Principles	Assessment
technology and skills support	
FUAD 7: Authenticity and situated learning	Students visit a public building and speak to the management of that building to identify development requirements. Students base their projects on that to make the project realistic and relevant.

Table 5.11 Assessing the remaining FUAD principles in public area design concept project5.5.1.3. Enablers and inhibitors

A major enabler in this assignment is the affiliations with government bodies that allow students to base their projects on existing buildings. This shows the importance of FUAD 7: authenticity and situated learning.

5.5.1.4. Suggested improvements to the assignment

It might be worthwhile to experiment with the assignment by trying to reduce the restrictions. For example, there could be an element in the instructions that promotes (and rewards) innovation in product type or procedure. This relates to FUAD 1 and 3, where the instructions need to reflect this tendency towards encouraging creativity and innovation.

5.6. FUAD principle 6: Accessibility to technology and skills support

The assignments chosen for this section are the three assignments where the absence of FUAD 6 is the reason why the assignment did not reach its fullest potential. In all three assignments, the interviewees complained that students were not doing well because they were lacking certain skills that they should have acquired from previous years of study. In the first assignment,

sustainability leaflet, the lecturer decided to implement the suggestions that were made based on FUAD 6 and reported positive results.

5.6.1. Sustainability leaflet

5.6.1.1. General description and evaluation of FUAD principle 6

This is an assessment for the module of Developing Independent Learning in the International Foundation Programme (tertiary level) and is worth 30% of the total module grade. Students are required to create an information leaflet targeting specific people and promoting the sustainable consumption of one or more resources. Students need to identify a resource which is being consumed unsustainably and then think of a solution based on research. The next stage is how to promote the solution and design the leaflet. The final product is specifically a leaflet submitted as a MS Word document.

The reason why students have to create a leaflet specifically is because, during the overall Foundation Programme, they have other assignments where they produce different products such as a presentation, a video, a website, a business project, a research report, and essays. The intention is to have students exposed to different types of output for their learning in preparation for their upcoming undergraduate years.

This is an individual task and students generally work on it outside the classroom. Access to the required software, in addition to a variety of other software that the students may wish to use, is provided by the university. However, there has been little support provided to students in terms of the

different affordances of different software. The lecturer stated that students are expected to practice independent learning (which is what the module is all about) and use whichever design software they already know. Alternatively, they can learn new software on their own.

> "They use MS Word or PowerPoint and if they know how to use some advanced software, they're allowed to do that. We don't teach those softwares, though. But they can explore by themselves. For example, if somebody is interested to learn Illustrator or Adobe Photoshop, it's kind of independent learning."

One of the problems that has been identified with the foundation level students is that not all of them have the same level of digital literacy skills due to their different backgrounds. There are some students who have not gained digital literacy skills from their schooling years. Hence, these students struggle more than others with assignments that require the use of technology. In addition to that, the assignment requires that they design a leaflet but submission should be in MS Word format, which is limited in terms of designing leaflets.

> "There are a lot of functions that are not available in MS Word. There's a lot of playing around which you cannot do with images or even text."

Despite the fact that the lecturer acknowledges that MS Word is limited, she gives a tutorial on how to use it to design a leaflet.

The lecturer reported that students often feel frustrated with the assignment and that the leaflets they submit were generally of low standards. Additionally, this assignment has the highest failure rate in the whole programme. When asked if there is anything that can be done about the skills that students were lacking, the lecturer expressed that it is difficult to provide support through arranging for guest lecturers to provide lectures on the needed skills. However, she mentioned that a small number of students used different software.

> "Illustrator. Many of them use it. Photoshop also. Some students use that. But that's a very small number."

Using the FUAD framework, I suggested that we activate peer learning and provide support workshops led by students who are skilled in certain design software. The first step was to identify a student from an earlier cohort who submitted a well-regarded leaflet. Once this was done, we asked the student which software she used to design her assignment and she said she had used MS Publisher, so we asked her to give a workshop on it. As she agreed, the lecturer arranged for a series of workshops on MS Publisher software, led by the student who walked the other students through the software's ins and outs, trouble-shooting aspects that were particularly relevant to the assignment. The workshops were very successful judging by the degree of interest and engagement of the students. They could see the relevance and importance of the workshop as it was directly related to their assignment.

The lecturer later reported that the submitted assignments were of better quality compared to previous cohorts. She gave particular examples such as how it was easier to tag the sources of information, how there were captions on images and so on. The lecturer decided to organise the same workshops in the following term for the new students.

This shows that by simply acknowledging the underlying skills needed for the assignment and providing support for it, the performance was noticeably improved. There were no data collected on the implementation of the workshops except for feedback from the lecturer on the general performance of students.

5.6.1.2. Assessing the remaining FUAD principles

Table 5.12 presents a summarised evaluation of the remaining FUAD principles.

FUAD Principles	Assessment
FUAD 1: Allowing choice of product, tools and procedure	Product: leaflet to be submitted electronically as a Word document (no other option allowed) but the content design is flexible: *"So whether they want to use image, whether they want to use a design, a different kind of font, a tagline, this is up to them. A specific kind of statistics, specific kind of pictures. How can they create a need for their initiative in the mind of their reader is up to them now."* Tools: Any tool for design purposes, but MS Word for final submission – the lecturer was under the impression that this is the only acceptable file type for TurnItIn (assignment submission software) – further investigation proved otherwise. Comment: the lecturer feels that more structure and less flexibility is needed in the tertiary level – flexibility can be increased in later years.

FUAD Principles	Assessment
FUDA 2: Co-construction of success criteria	Constructed by module coordinator and approved by external reviewer – no student input. Rationale: This is an off-shore British university. All module instructions, content, success criteria, etc., come from the department in the main campus after a process of approvals from internal and external reviewers (institutional restrictions)
FUAD 3: Generic description	Specific description of requirements and tools with limited flexibility *"the leaflet should be a minimum of two and a maximum of four A4 size pages. You may design it using MS Word or PowerPoint. If you wish to use any other design software, you must ensure that you copy the final work into Word because TurnItIn only accepts Word format submissions." (Assignment Handbook, p.17)* Comment: This is an example of how restriction is due to the lecturer's lack of knowledge of the technical specifications of TurnItIn (which accepts a range of file types).
FUAD 4: Agnostic services	MS Word and PowerPoint are both Windows compatible software. Although there are versions that are compatible with iOS devices, there still are incompatibilities. Support was given for MS Publisher, which is also part of the Microsoft Office suite.
FUAD 5: Social, collaborative, knowledge construction	Individual work *"Students work in groups for some of the IFP assignments and individually in others. This particular assignment is individual and they need to figure it out on their own."*
FUAD 7: Authenticity and situated learning	Assignment is relevant to the immediate context students are living in. They need to identify a resource that is being unsustainably consumed and come up with a solution for sustainable consumption and promote it to the local population

Table 5.12. Assessing the remaining FUAD principles in sustainability leaflet assignment

5.6.1.3. Enablers and inhibitors

The research component of the assignment was identified by the lecturer as an enabler. The fact that students are required to do research relevant to their local geography makes the work real and relevant. On the other hand, lack of

skills support is an inhibitor. Some students lack the required digital skills needed to produce an electronic leaflet. Moreover, the assignment is designed in a way that requires a number of skills that are not taught in the module. Students need some background knowledge of marketing and design elements to facilitate doing the assignment:

> "I feel two things are needed. Perhaps some kind of guidance to them on marketing, and on design elements, promotion, advertising. Perhaps something from our media department. And something on advertising, you know, semantics, and on what kind of images convey what messages and how to use them effectively."

5.6.1.4. Suggested improvements to the assignment

The lack of digital skills support was addressed, as mentioned earlier, by the workshops led by a former student. A similar arrangement could be made with the media department or the marketing department to nominate a student who could conduct workshops on marketing or design matters.

5.6.2. Reflective journal

5.6.2.1. General description and evaluation of FUAD principle 6

The reflective journal is a recurrent assignment designed to document students' reflections during their undergraduate clinical practice starting from the third year of the Medical Diagnostic Imaging Programme. Although clinical practice starts in the second semester of the second year, the reflective

journal assignment starts from the third year, i.e. with the second clinical practice. Every semester, the focus of the reflective journal is different and follows the same focus of the clinical practice. At the end of each semester, students are required to submit a reflective journal with one entry, a report and a presentation of a case study.

The reflective journal assignment is a summative assignment that is designed to follow the LEARN (Look back, Elaborate and describe, Analyse, Revise and New trial) reflective model (College of Nurses of Ontario, 1996). Students are given sets of sub-questions for each stage to guide their reflection. Students need to identify a significant case that they encountered during clinical practice and reflect on it. They follow the guiding questions and attempt to relate the incident or the case to the literature on similar cases. The reflection is considered to be well-designed but students have not been performing well in this assignment. There is a general concern from the lecturer that the reflection is shallow and students often complain that they do not know what to reflect about. Word count in students' responses is said to be minimal.

Students used to be required to submit three entries and receive feedback on each of them, which was considered a better way to train students on reflective writing. Now, due to the increase in student numbers, the number of reflective journal entries has dropped from three to one. The lecturer feels that one reflection per semester does not build the required skills, particularly that of critical thinking. However, more reflection can be challenging for lecturers to grade due to student numbers.

The assignment requires the presence of a set of academic skills that are necessary to complete it successfully. These skills are reflective thinking, critical thinking, emotional intelligence, as well as citing and referencing skills (manually and digitally). The support provided for reflective skills takes place in an introductory lecture (or workshop) that is given to students at the beginning of clinical practice starting in the second year. In this introductory session, the lecturer introduces what reflection is:

> "At the beginning of each semester, we have a workshop. It's called the clinical training workshop. In this workshop we discuss everything related to the reflective journal. Even what they need to reflect on. We give them the clinical practice manual and we go through everything including their attendance; how they should look; what they should wear and all the details; the assignments; grade distribution; final exams… etc."

The introductory workshop is somewhat generic and does not seem to focus on the reflective journal only. As for the citing and referencing skills, they learn it in the first year, in the first semester in the university. There are two sessions where they discuss report-writing, citing and referencing.

> "We have two sessions on how to write a report. Font, cover page, a preliminary task. To link it with scientific information, we will invite the library to show us what facilities we have in the library, how to access e-books, if they want to search for

> information, they can search it in Google Scholar. How to access the data base. The session ends with referencing styles. We talk about the APA, the MLA, the differences between them. What are the available softwares, Endnote, Mendeley, etc."

However, students would still need support for these skills, particularly because they had studied them only briefly back in year 1. Students may need some support to refresh their knowledge. The lecturer commented that students do not know how to reflect or what to reflect on:

> "In the reflective journal, the problem is that most people don't know how to express their feelings. So it will be difficult for them to write."

> "Sometimes when something happens, not everyone can pay attention to it. They have difficulty identifying an incident to reflect on."

Another problem that the lecturer pointed to is that lecturers are neither that aware of the educational value of reflective writing, nor have they been trained on it before. This creates a problem, because it means lecturers are not able to provide extra support in that regard. Additionally, grading becomes an issue as to how lecturers can grade reflection if they have not had training on it.

> "With regards to grading it, I think our reflective skills are also an issue. You know when you read a sentence, how you interpret it, this is an issue."

In this case, the skills support that is needed is particularly on reflective writing, not only for students, but for teaching staff as well.

5.6.2.2. Assessing the remaining FUAD principles

Table 5.13 presents a summarised evaluation of the remaining FUAD principles.

FUAD Principles	Assessment
FUAD 1: Allowing choice of product, tools and procedure	Topic: students choose any incident from their clinical practice Product: prescribed – text format to be submitted online within an e-portfolio Procedure: reflection is guided by a number of questions to help students reflect – minimum of 2 to 3 lines of reflection per question (to prevent short answers) – an additional requirement is to link the incident and the action taken to the literature.
FUDA 2: Co-construction of success criteria	No grading rubric or success criteria for this assignment – lecturers use their own judgment to grade – no student input.
FUAD 3: Generic description	Generic description of reflection, its importance, and what reflective model the students are required to use, followed by a set of questions that should lead their reflection. No submission instructions such as product type, grades, how and where to submit, where to get extra information, etc.
FUAD 4: Agnostic services	The online space where the reflection is submitted is device agnostic.
FUAD 5: Social, collaborative, knowledge construction	Individual task – reflection is a personal practice
FUAD 7: Authenticity and situated learning	Assignment is authentic and situated – reflection is on an incident in real-life practice in the hospital

Table 5.13. Assessing the remaining FUAD principles in reflective journal assignment

5.6.2.3. Enablers and inhibitors

The lecturer identified a number of inhibitors, the main one being student numbers. In previous years, students used to write three reflective journal entries and they used to give peer feedback to each other. The lecturer reported that it was a very useful practice:

> "I requested that students submit two drafts. The first draft is to be assessed by their peers for formative purposes. I got very nice results. I found out that not only the good students can write good comments. […] They proved that they are capable of critically analysing each other's work."

This practice no longer exists due to the increase in student numbers. She explained that due to that increase, lecturers were not able to give better training on reflective writing. They were also forced to cut down the number of required reflections from three to one due to the difficulty of grading three reflections for so many students.

> "I believe that reduction of course-work is not in the best interest of students. The problem will not affect the grades. The problem is how will they will look at the work in the future. How to become a lifelong learner. To build reflective skills, we need the student to do more than one reflective journal to get enough training on how to reflect."

Another inhibitor is that students do not know how to reflect or what to reflect on. This means that the introductory workshop is not effective enough in training students on the skill of reflective thinking and reflective writing and this is relevant to FUAD 6. Lecturers are also reported to be not aware of the educational value of reflective writing.

5.6.2.4. Suggested improvements to the assignment

This assignment can benefit from the Mini conference presentation (section 5.2.1) in terms of choice of product and how collaboration can be built into this individual assignment. Students can form support groups or peer feedback groups to help each other with the assignment before they submit it. A requirement can be added to the task which is the requirement that each student should give feedback to at least two other students. In order to do that, they need success criteria and a marking scheme that they understand well, or better still, that they co-construct.

Another experience that is relevant here is that of the previous leaflet assignment (5.6.1) where workshops were designed to support students with the needed skills for the assignment. Perhaps in this reflective journal assignment, support is also needed for teaching staff. A practice that could help create a mutual understanding of the assignment is the co-construction of success criteria. Having lecturers and students discuss and agree on the success criteria would ensure that they all have a good understanding of what the assignment is about and what elements need to be included. This could help students write better assignments and lecturers grade them in a more objective and unified way.

Another suggestion relevant to FUAD 7 is that of linking the assignment to real life. When asked about whether or not radiologists have to reflect on their work as part of their job duties, the lecturer said that they normally do not have to. However, when probed further about whether or not they have to document cases and write a log of what procedures they did and record any special circumstances, she confirmed that they do. A suggestion was given to the lecturer that maybe linking the assignment to this real practice could give it further depth and relevance.

> "Radiologists have a book. There are three shifts. At the end of each shift, there's a handover. They need to give an account of and reflect on what happened during the shift. It is a kind of reflection about the day."

This handover account may not have all the qualities of reflection. It may not be personal or document feelings. It is still the closest possible practice that can be linked to reflection. Highlighting this practice to the students may make the assignment more relevant to their future practice.

5.6.3. Case study presentation

5.6.3.1. General description and evaluation of FUAD principle 6

This case study assignment is worth a grade of 20% of the third year Clinical Practice course and is presented as a written report with an oral presentation. Students are reported to be interested in the assignment and are seen to be investing time and effort and getting results that are approved by the lecturers.

The students are required to choose a patient with pathology they find interesting. Then, they are to write and present a case study on it. The lecturer seemed satisfied with how the assignment is designed. Nevertheless, he identified some inhibiting factors. The assignment is purely an individual one; no collaboration is required. The main issue is with student presentation skills, which are seen to improve regardless of the fact that there is no preparation or support in terms of such skills. The assignment seems to be working effectively except for minor issues that are related to the hospitals where the clinical practice is carried out.

The lecturers are the main source of support. The degree to which the assignment is prescribed and the fact that there is no peer feedback or groupwork show that there is limited student agency.

There seems to be a contradiction in the assignment between the lecturer's perceptions and the way the assignment is designed. While the lecturer said that they encourage creativity, he later said that they want more unified products (assignments) to ensure that all students are the same, particularly because they will be graded.

When it comes to submission, the report is submitted first, then a presentation is scheduled. The presentation slides do not need to be submitted.

This assignment does not require any high-level digital skills. The lecturer has neither noticed any technical or IT problems nor did the students report any issues. Therefore, the lecturer does not perceive a need to provide any support in that regard. However, other issues are mentioned such as the lack of presentation skills, but nothing is planned to help students overcome them.

The only support that is provided is from lecturers, as students are welcome to get individual feedback from them. In this case, accessibility to support is in the form of lecturers being available to answer questions, whether on content or presentation design or any other matter that is needed by students.

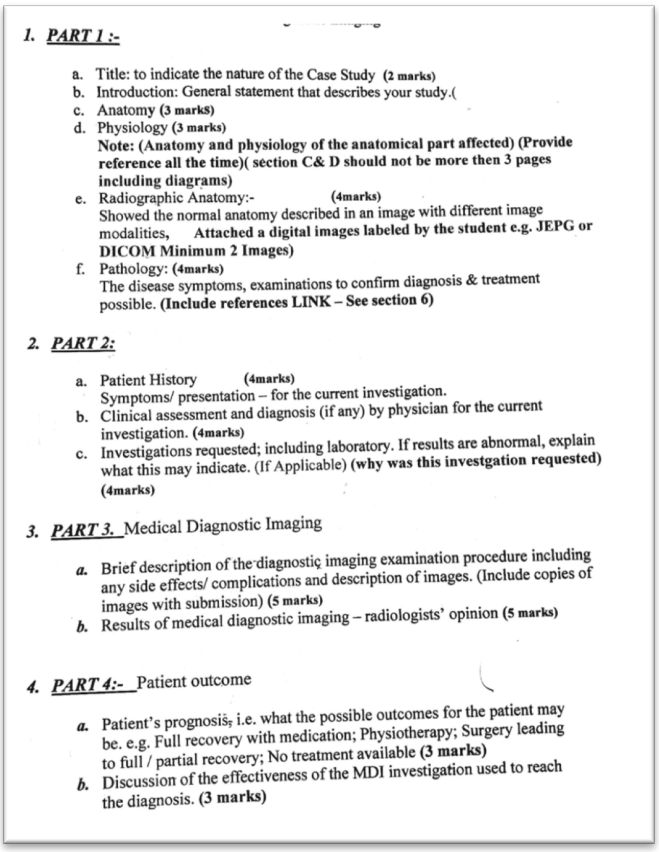
5.6.3.2. Assessing the remaining FUAD principles

Table 5.14 presents a summarised evaluation of the remaining FUAD principles and Figure 5.7 shows the assignment description.

FUAD Principles	Assessment
FUAD 1: Allowing choice of product, tools and procedure	Topic: students choose within the general focus of the semester – to ensure semester outcomes are met Tools: MS Word for the report – no restriction for presentation as long as it is in the form of slides. Other forms (posters, infographics, video, etc.) are not allowed: *"that would be difficult to manage. We also need something unified so that they are all the same. Particularly because it involves grades."* Procedure: prescribed – particular order of information for both report and presentation Other specific requirements: images to be saved on a CD in a specified image format to ensure effective quality when magnified
FUDA 2: Co-construction of success criteria	The marking criteria is a list of the different sections of the presentation with a scale from 0 to 3 - no grade descriptors – no input from students
FUAD 3: Generic description	Specific and overprescribed instructions (Figure 5.7) Over-prescription is perceived by the lecturer as a means of support for students (similar to the taxation coursework section 5.8.1) Students are required to follow the same order and produce the work in the same prescribed way
FUAD 4: Agnostic services	Submission platform is agnostic
FUAD 5: Social, collaborative, knowledge construction	Individual work – however, students group themselves independently outside of the classroom to support each other

FUAD Principles	Assessment
	"They rehearse before the presentation. On their own. We see them sometimes in the lecture hall presenting to each other to practice."
FUAD 7: Authenticity and situated learning	Authentic and situated assignment – based on the cases students experience during their hospital clinical practice Also, case presentation resembles the presentations radiographers do as part of their jobs. Students attend these real presentations and see radiographers discussing real-life cases.

Table 5.14. Assessing the remaining FUAD principles in case study presentation



1. ***PART 1 :-***

   a. Title: to indicate the nature of the Case Study **(2 marks)**
   b. Introduction: General statement that describes your study.(
   c. Anatomy **(3 marks)**
   d. Physiology **(3 marks)**
      Note: (Anatomy and physiology of the anatomical part affected) (Provide reference all the time)(section C& D should not be more then 3 pages including diagrams)
   e. Radiographic Anatomy:- **(4marks)**
      Showed the normal anatomy described in an image with different image modalities, **Attached a digital images labeled by the student e.g. JEPG or DICOM Minimum 2 Images)**
   f. Pathology: **(4marks)**
      The disease symptoms, examinations to confirm diagnosis & treatment possible. **(Include references LINK – See section 6)**

2. ***PART 2:***

   a. Patient History **(4marks)**
      Symptoms/ presentation – for the current investigation.
   b. Clinical assessment and diagnosis (if any) by physician for the current investigation. **(4marks)**
   c. Investigations requested; including laboratory. If results are abnormal, explain what this may indicate. (If Applicable) **(why was this investgation requested) (4marks)**

3. ***PART 3.*** Medical Diagnostic Imaging

   a. Brief description of the diagnostic imaging examination procedure including any side effects/ complications and description of images. (Include copies of images with submission) **(5 marks)**
   b. Results of medical diagnostic imaging – radiologists' opinion **(5 marks)**

4. ***PART 4:-*** Patient outcome

   a. Patient's prognosis, i.e. what the possible outcomes for the patient may be. e.g. Full recovery with medication; Physiotherapy; Surgery leading to full / partial recovery; No treatment available **(3 marks)**
   b. Discussion of the effectiveness of the MDI investigation used to reach the diagnosis. **(3 marks)**

Figure 5.7 Case Study assignment description

5.6.3.3. Enablers and inhibitors

The lecturer identified an important enabler, which is relevant to FUAD 7. Students are reported to be interested in this case study and invest considerable amounts of time and effort. One reason given is that the whole

learning process is situated in real hospital circumstances. The authenticity and situatedness of this assignment may be the reason for students' engagement and interest.

> "Maybe because it is more interesting as well. There is pathology, there is a [real] patient they need to follow, it is more of data collection."

He explains the reason as follows:

> "They collect the cases themselves. They see the patient and they build interest about the case and they start following the case in the hospital."

The main inhibitor is the struggle due to hospital policy with patient images.

> "We are facing some problems because some hospitals refuse to give the patient images. Mostly it's the hospitals in Dubai. Even if we remove the name and personal information, even if the students take pictures with their mobile phones without any data, we are still facing problems due to patient information privacy."

Another inhibitor is linked to FUAD 6 regarding skills support. The lecturer pointed out that the students lack presentation skills and some of them suffer stage fright.

Detailed, over-prescribed instructions were identified by the lecturer as an enabler, and it may have its benefits in terms of clarity. Nonetheless, it undermines student agency and keeps the power frames set towards the lecturer as the main gatekeeper of knowledge. Students need more agency and more empowerment, which is difficult to achieve within this set-up.

5.6.3.4. Suggested improvements to the assignment

Students need some support in presentation skills (FUAD 6). Such support can be in different forms such as workshops or even resources and links to related videos on how to present. Similarly, students may benefit from designing opportunities for formalised peer feedback (FUAD 5) with more detailed success criteria (FUAD 2) to function as a reference point.

5.7. FUAD principle 7: Authenticity and situated learning

The following two assignments are examples of how learning can be authentic and situated. Both are by the same lecturer in the department of computer engineering. The first assignment is an example of how the topic was changed to suit current events and to fulfil an actual need in that event.

5.7.1. PID for Expo 2020 volunteer app

5.7.1.1. General description and evaluation of FUAD principle 7

The main impression of this coursework assignment is the fact that it is impressively authentic and relevant to a real-life event, Expo 2020. It is a coursework assignment worth 40% of the module grade for second year students of the Research Methodology and Project Management module.

Students were required to put together a Project Initiation Document (PID) to show their knowledge of project management skills and procedures. The original design of the coursework assignment had been a scenario where students were requested to plan a dinner party. The lecturer felt that this scenario was not suitable for computer engineering students and had little relevance to the real-life job experience of computer engineers. Therefore, he changed the scenario to planning and managing the design of an app for volunteers in the upcoming event of Expo 2020 in Dubai. Students were required to produce a PID for that project where they managed a team of 8 people who would be involved in creating the app.

> "You are asked to lead a cross-functional task force team, consisting of Marketing, Finance, HR, and Logistics colleagues, to come up with an Expo 2020 Volunteer App to ease the communication between all stakeholders." (Assignment instructions)

The final product, which is the PID, consists of a number of things, including the Work Breakdown Structure (WBS), four field maps with gateways, and then a Gantt chart along with a written description to fill out the proposal. Students produce the document individually. No group work is involved throughout the assignment.

Authenticity is a successful element and the main feature of the coursework. The fact that the context of the assignment was changed from managing a dinner party to managing a project for the creation of an app for Expo 2020

made the assignment relevant to the context of students in Dubai. It became authentic and involved actual companies in Dubai, as students needed to contact companies to get real price estimations.

> "What better thing to do than bring in an event that UAE is doing. In fact, Expo2020 are recruiting now. They have a platform where you can apply as a volunteer…; therefore, it is a good time. So I thought if they can come up with a proposal or idea, we can actually share it with Expo2020. And you can convert this assignment to an actual project."

Students are encouraged to take their project forward to the next level (beyond the assignment) by implementing the app and applying to Expo 2020 as vendors to supply this volunteer management app.

> "We do promote making the app later, which is out of the assessment but we encourage them because there is a bidding portal on Expo2020 where you can go and become a vendor, supply them an app and you might get selected."

This shows a high degree of real-life job relevance, and situating students' learning in an appropriate context while at the same time showing them the relevance of their work by encouraging them to contact companies and request quotations for app development.

> "So the first step of the assignment is to do a review of the existing apps. Look at what platforms they have used, what

features they offer, and then consider if you are introducing a new app, would you require some connectivity? Can you draw some inferences from the good features of these apps and build it into the design? They can integrate it and not keep it as a standalone app. Last year, many of them actually wrote to the Expo 2020 team for some data that they required. […] So let's say if they are outsourcing this, they do not know how much it would cost. So what they did is that they looked at certain companies which do have app development. They called them. They told them we want to develop an app like this and this is the requirement and can you give us the figure. They got actual quotations from those companies and they put those figures and gave references to the quotations they got."

The lecturer reported that students were highly engaged, particularly because of the opportunity of turning this coursework assignment into an actual product to be used in Expo2020.

5.7.1.2. Assessing the remaining FUAD principles

Table 5.15 presents a summarised evaluation of the remaining FUAD principles.

FUAD Principles	Assessment
FUAD 1: Allowing choice of product, tools and procedure	Product: PID document - tools: not specified – any tool Procedure: specified; however, students are encouraged to be creative and show initiative beyond the instructions with 10% grade for this category.

FUAD Principles	Assessment
	"By initiative, we mean this: did you contact the company for getting the real figures? Do you have real numbers in place? Has the student gone beyond what was given to them in a presentation? Are their arguments valid enough? And with creativity we mean to say there are certain things given in the document… But can they do anything beyond this? Can you add an extra feature that will solve an issue?"
FUDA 2: Co-construction of success criteria	The marking criteria list the different sections that are required for the coursework and specifies a grade next to each section – no grade descriptors – no student input The lecturer agrees that this may lead to subjectivity in grading
FUAD 3: Generic description	Generic description of project and submission requirements – no specifically required tools e.g. "*Submission instructions: Electronic copy uploaded via Turnitin to the CCE2060 UniHub website*" (Assignment instructions) The instructions document lists the required sections of the PID but it clearly states that the expectation is to go beyond it to show creativity and initiative. The document also provides examples from last year's creative submissions.
FUAD 4: Agnostic services	Services used: University LMS – TurnItIn assignment submission software – Google Drive – all agnostic and cloud-based
FUAD 5: Social, collaborative, knowledge construction	Individual work – the lecturer agrees that there should be a way to foster collaboration, peer support and knowledge sharing among students particularly because some learners have more exposure to the industries than others. Collaboration might bridge the gap between learners.
FUAD 6: Accessibility to technology and skills support	The lecturer provides support in the form of answering students' questions, sharing contacts with companies, providing sample PIDs, as well as any other related resources.

Table 5.15. Assessing the remaining FUAD principles in PID for Expo 2020

5.7.1.3. Enablers and inhibitors

The most important enabler in this assignment is linked to FUADs 6 and 7. The computer engineering department has made connections with well-established companies. This makes the degree programme more authentic

and situated and it enables students to gain skills support from the industries. The lecturer explains how this enabling factor has impacted students' performance:

> "I would say our corporate tie-ups with good companies. In the sense that our department has a formal alliance with Microsoft. Microsoft usually visits the university. They conduct workshops on recent technologies. We have a Cisco academic alliance where Cisco offers certain programmes on app development and so on. Our students are getting a flavour of real-life companies and the recent technologies which makes their assignments better, I believe. Because they have been interacting with these workshops and the academic alliance courses and the trainers form the industry, I think they have a better exposure to work within a realistic scenario. A lot of solutions they come up with are beyond what is taught in the modules. And more realistic. That is one enabler I would say."

However, support does not only come from companies which have alliances with the department, students tend to contact other firms as well. In such cases, the students and the lecturer are often faced by many bureaucracies in terms of approvals and ethical checks. This needs a body or department that would deal with such firms and companies. The lecturer notes that absence of such a department is an inhibitor.

> "If we have a department where students can go to ask for relevant contacts and get help with permissions. Some students do not take these steps because they do not know how to. So if there had been someone who could give support just in terms of LinkedIn connections for example, and how to make contacts and deal with emails of information requests."

5.7.1.4 Suggested improvements to the assignment

Social collaborative knowledge construction (FUAD 5) could be integrated more. The lecturer could identify learner differences and use them in a meaningful way. The lecturer agreed to this suggestion:

> "There should be a way to look at student differences and workout a way which will benefit the students."

5.7.2. Private cloud platform

5.7.2.1. General description and evaluation of FUAD principle 7

Developing a virtual cloud machine is an assignment for computer engineering Master's students in the Virtualisation and Cloud Computing module and carries 20% of the module grade. Students are required to demonstrate their knowledge of Infrastructure as a Service (IaaS) by developing virtualised computing resources. The project consists of the implementation of the virtual machine, a demonstration of the machine, and a written report in which students describe the process and justify the choices that were made. The project is practical and authentic because it resembles the same commercial

service provided by companies. Students are enthusiastic and engaged because of this authenticity. They work in groups, use the tools of their choice and in the place of their choice within campus. However, they do not have any input in the marking criteria of the assignment. Students can use their own networks and resources and collaborate to do this project. This is seen as a two-sided coin. The fact that students use their own PCs is seen to be a challenge, an enabler, and an inhibitor at the same time. It is a challenge because implementing the project on students' personal computers may cause computers to crash, and may also create too many errors and will need continuous debugging. However, overcoming these challenges is highly enriching to students and resembles real-life situations, which means they gain a first-hand experience of the challenges of the real-world. The same situation can be inhibiting to some students because they may not wish to take the risk with their personal computers or they may feel the challenge is beyond them. In this case, they can opt to use the homogenous PCs provided for them by the university. This means complying with the rules and regulations of the institution, which can be limiting and time consuming. So the choice is either to face the challenge or to comply with the rules and regulations of using the university's PCs.

The scenario for this assignment is realistic and similar to what happens in companies that provide this type of service. Students realise this as most of them are already employed in IT companies. This realistic scenario serves as a motivating aspect, which encourages them to risk using their own laptops because in real life, companies do not use the exact same computers to create the virtual machine. This, according to the lecturer, is the main reason

students do not complain that there are not enough administration rights for them to be able to use the university computers.

But this makes the project more challenging for students. The lecturer mentioned one group of students who went out of their way to make the project as similar as possible to what happens in industry. So they invested in hardware and created a real cloud service which they can be paid for.

> "There was this one group. They were extremely passionate about the cloud right from the start and they got new hardware, a new server, which requires considerable investment. So they got real small machines from IBM and administered this on it. They said that they wanted it to be as close to the industry machines as possible. So they got an IBM server and made a client server model out of the laptops… And they actually started running that service."

Clearly, authenticity is a motivational aspect to students. It helps them see the relevance of learning, therefore leading to more engagement and better results.

5.7.2.2. Assessing the remaining FUAD principles

Table 5.16 presents a summarised evaluation of the remaining FUAD principles.

FUAD Principles	Assessment
FUAD 1: Allowing choice of product, tools and procedure	Product: virtual machine and report (text-based) Tools: students' own laptops or university PCs – students' preferred cloud platform software (Freeware or licenced) – general advice is to use homogeneous computers without specifying any configuration *"Most of our post grad students are working in IT companies. And in these companies, they use virtualisation software. They would be more comfortable, and they have a license and they want to use it, so why not. You could use any software which could serve the purpose and you implement it. And plus, these are better software and come with more sophistication and more options for doing this project. So, it's good! We give them the choice."* Procedure: no restrictions – students are free to follow any way they like
FUDA 2: Co-construction of success criteria	There's a mark scheme with grade distribution only – no descriptors – no student input
FUAD 3: Generic description	Generic description – flexible requirements are listed along with statements that allow choice: *"3. Install cloud platform software of your choice such as VMware, vSphere, Open Stack, etc. and make sure it is fully operational"* (Instructions document) Focus is on outcome not procedure. "4. Demonstrate that you can launch virtual machines (also known as instances) e.g. Ubuntu desktop/server or Windows 10. "5. Demonstrate that you can access the instances using a remote computer, just like any user would." (Instructions document)
FUAD 4: Agnostic services	No commitment to any particular software or platform
FUAD 5: Social, collaborative, knowledge construction	Group work – students are purposefully instructed to choose their own groups. They are mostly working adults with busy schedules. They need to work with people with similar timings and compatible laptops.
FUAD 6: Accessibility to technology and skills support	University PCs are made available for students in case they did not wish to use their own laptops. They often require administration rights to be able to format the computers and install new operating systems or new software. They also need to seek approvals from the IT office, which takes time and delays work on the project.

Table 5.16. Assessing the remaining FUAD principles in private cloud platform

5.7.2.3. Enablers and inhibitors

From the account given by the lecturer, it can be deduced that there is a number of enablers in this project. First, the choices (FUAD 1) of hardware and software that are given to the students enable them to use the tools that they know best, be it an open source freeware or hardware or even the place where they want to set their virtual machines. The lecturer is flexible enough and would go to them for assessment instead of students having to carry their machines and all the wiring to the lecturer.

> "the students would be at different places. Some of them would be using our Cisco labs. Some of them would be in the Engineering lab because they need to find two or three machines. Or some of them will be in the Post Graduate Lounge working with their laptops, and they can't bring the whole set-up to a classroom because it's all connected with wires. So I personally visit these groups, they show the demo there, and I test it myself."

As mentioned above, not having enough dedicated PCs in the university laboratories for the students to work on is considered both an enabler and an inhibitor. Working with multiple platforms and computers with different specifications is more challenging. Yet, it resemble the challenges faced in real-life job situations. Therefore, it is identified as a challenge, but possibly also as an enabler at the same time.

5.7.2.4. Suggested improvements to the assignment

Students can document their work on the project by taking video clips of the different stages and then combining them into a video. This video can be an alternative or an extra choice to making a live demonstration. The lecturer welcomed this suggestion and mentioned that he will consider adding it to the project in the future.

5.8. Technical and procedural assignments

Sometimes, the nature of the assignment is to train students on existing procedures that students will have to do in their future jobs. In such assignments, it becomes a challenge to add an element of creativity or innovation. The challenge becomes bigger if the lecturer is not flexible enough or is too cautious about introducing change.

5.8.1. Principles of Taxation module coursework

5.8.1.1. General description

This coursework assignment is for Principles of Taxation, which is a third year module. It is introduced in week four of the term with a draft submission at the end of term 1 (week 12), final submission at the end of the year (week 24) and is worth 30% of the module grade. The task is a highly technical task and simulates real-life job experience in some parts.

The coursework is diversified in terms of requirements. Students need to analyse a pay slip (task 1), summarise an article (task 2), produce a financial statement using Microsoft Excel (tasks 3 and 4), do some taxation calculations using OneSource

software (task 5), prepare corporate tax computations using OneSource corporate tax software (task 6), and finally evaluate OneSource (task 7).

5.8.1.2. Assessing the seven FUAD principles

Students are allowed some choice in terms of resources for tasks 1 and 2, but not in the tools or procedure (FUAD 1). There is an opportunity for choice in terms of sources. In Task 2, for example, students are told to choose from a list of 30+ articles that are chosen by the module tutors.

> "We give the complete list and we ask them to go through any five articles. It's a list of our own 30-plus articles."

Another example is the choice offered in Task 2. Students are instructed to find explanations in two sources but other sources are also acceptable (see Figure 5.1).

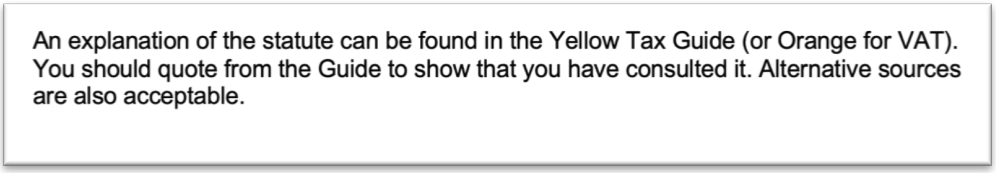


Figure 5.1. Principles of Taxation coursework instructions

Although both tasks (1 and 2) allow choice from specified, tutor-chosen options, choice beyond the suggested sources is not allowed in task 1 but is allowed in task 2. This could be an example of flexibility within limits (Bennett, 2014) where the limits are set around the choices offered to students. The lecturer explains the reasons why students are discouraged from choosing beyond the provided list in task 1:

> “I usually discourage them from attempting to choose other articles. It’s not that I'm very strict on that, but it is just giving this convenience to them that otherwise they will have to go through first the contextual framework to learn the content which is not part of the syllabus and then they will have to analyse the case. So it could be a very taxing exercise.”

In terms of allowing choice of product, it was not permitted in any way. There is clear specification of the type of product throughout the tasks. Students must produce a MS Word document, a MS Excel sheet and a OneSource report as is clearly stated in the instructions document. This means the tools (production software) were also restricted.

The lecturer acknowledges the availability of other taxation software. He maintains that they will only require OneSource because it is widely used in companies. He feels that it is an advantage that this software is available to students on university computers. However, not much training goes into preparing students to use it (FUAD 6). Students are provided with an extensive manual and the lecturer walks the students through the initiation part of setting an account, logging in, creating an ID, but students have to take over from there. It would be interesting to find out the students’ perspective on this matter and whether they would have welcomed more support with the software.

In another example, the lecturer clearly mentioned that when students asked permission to produce a different type of product, e.g. use Pages or Numbers

for Mac, they were required to revert back to MS Office (FUAD 4). Therefore, choice of tools was restricted. This is limiting to the students who mainly work on a Mac computer. It results in disadvantaging them in the sense that they will need to look for alternatives and spend more time finding solutions.

Success criteria (FUAD 2) are predetermined and prescribed solely by the module coordinators. Learners have no input except for the feedback they give on the coursework which is taken into consideration when planning for the upcoming cohort.

> "We developed the assignment and then year-on-year [updated it] based on the feedback. We kept modifying it. Now I can say there is no further room for any modification."

The quote here refers to modifications in the assignment itself which may or may not include success criteria. There is minimal shift of power here, which comes in the form of student feedback. The collaborative knowledge culture (FUAD 5) is clearly not being built between lecturers and students; however, group tasks enable the creation of collaborative knowledge culture among students only.

Upon examining the coursework documents, it was clear that the tasks are quite prescribed and far from being generic (FUAD 3). There is a clear specification of the final product of each task. The written instructions clearly state the tools and the structure of each task. In tasks 1 and 2, students are required to present their analysis in a specifically-structured MS Word document, while tasks 3 and 4 are specifically MS Excel exercises and tasks

5, 6 and 7 are done on OneSource tax software. The lecturer stressed that they would not accept any other alternative for practical reasons such as accommodating the (anticipated) preferences of the external examiner.

> "They do not want to create any kind of hiccups for the second marking and external marking. These people have a tight schedule. If the external examiner says 'no I'm not comfortable with Mac' so sending this one [Pages or Numbers documents] and at that tight time [head shake - indicating that it is not possible!]."

This way, the range and mix of representational modes is limited, if not eliminated. Only very specific types of products are expected. There is no room to embrace learner differences in terms of the different digital skills they have in order to explore how it can be used to enrich the learning environment.

The coursework is supported by a discussion board used to help troubleshoot issues and questions regarding the different tasks. The discussion board is on the LMS which is web-based, hence device agnostic (FUAD 4). Other than that, it is customary to expect the use of MS Office to produce the required work. Conformity here supersedes neutrality and creativity. By only subscribing to certain software and certain services, little neutrality is displayed, therefore invoking questions with regard to democratic access and the decolonising of education. The devices that students use are not taken into consideration and the general assumption is that it is the student's responsibility to find a way to conform. Although students' digital devices are

varied and lie in the background, the lecturers require specific output that can only be possible if students are resourceful enough to take extra measures to be able to do the required tasks. This can disadvantage some students since it requires them to spend extra time and effort to look for alternative ways.

The coursework is mainly group work, except for one individual task. Upon enquiring about the purpose of grouping students and how they are grouped, the lecturer explained that the main purpose is to facilitate collaboration among students (FUAD 5). When probed further, the lecturer explained that students tend to form groups on their own and the lecturer would interfere only to ensure mixed ability groups where students can provide ample support to group members. This definitely enables social learning, collaboration and shared perspectives. There is an element of recognising learner differences to use them as a productive resource as well as building a collaborative knowledge culture.

> "First we give students the opportunity to form the group. Then we check if some people are struggling in getting along with the software or even with the subject, so we try to fix those students in suitable groups."

Access is provided to OneSource software (FUAD 6). The university has purchased licenses to make it available to students for training purposes.

The coursework requires the students to apply knowledge and skills that are taught in the taxation module using other skills that were supposedly acquired outside of the module. It is generally assumed that students already have

these skills, that all students are ‘tech savvy’ and are capable of, for example, handling OneSource, despite the fact that it is a specialised taxation software and not a common software.

> “Some students were feeling uncomfortable in the beginning when they go on to the system for the first time. So we decided to do the initial part with them and then after that they are smart enough to carry on with it.”

In this case, it can be said that although support is not planned or provided, peer learning is activated (through group work) and is seen to be enough for students in terms of support.

There is a general belief that students are better than faculty in learning technology. This may be a misconception. Not all students have the same background or the same digital literacy skills. Again, there is no catering for student differences. The lecturer’s response to this matter is that they try to give equal access to all students but feel that there is not much to be done if some students are less capable due to their background or previous learning experiences or exposure to technology.

> “We make sure that all are having equal access to the information, to the software, and learning. I would say judiciously if I don't want to say equally. It’s not under my control if people are different.”

The course work has real-life job relevance (FUAD 7). This is a step towards blurring the institutional/corporate boundaries. Task 3 instructions mention that the purpose is to revisit basic MS Excel functions which are essential employability skills. In addition, task 5 has a clear job relevance. The coursework document clearly states that:

> "The purpose of this task is to give you practical experience of using a leading tax software package to prepare corporation tax computations. Take a copy to your first job interview to show the interviewer the practical relevance of your degree work!" (Coursework Instructions)

Task 7 requires students to evaluate OneSource software. There is a further element of crossing boundaries here in that students give feedback to the software developers and according to the lecturer have won twice in a competition initiated by the software developers.

> "Thomson Reuters have come forward. They said that if those who are using this software can give a candid and critical evaluation of the software, they are going to be awarded prizes. And you will be surprised to know that the last two years our campus has won the prize."

Such practice is a specific example of 'crossing- boundaries' where the educational path crosses the professional path. It is empowering to students on many levels starting with establishing a network to re-imagining current practices.

5.8.1.3. Enablers and inhibitors

The lecturer considers giving detailed instruction as an enabling factor. Another enabling factor is the continued reminders and links provided by the lecturer.

> "The instruction is definitely at first place. It's going to be very very instrumental for them. And second, as I said earlier, is that I used to clarify things at the end of the lecture or seminar and link them to certain tasks in the coursework. When a particular thing is covered, how that particular thing is going to be worked upon in the coursework task."

Timeframe, on the other hand, was mentioned as an inhibitor. Crammed curriculum in a limited timeframe requires high support such as over-structured, over-prescribed assignments in order to save time.

There is also the procedural restrictions that are limiting students. Asking students to conform in terms of software and type of product has the purpose of reducing difficulties for the moderator and the external examiner.

5.8.1.4. Discussion and suggested improvements

Most tasks are done in groups except for one individual task (Task 5). The coursework seems to be well explained and structured, bordering on being over-prescribed. There are instances when it allows some flexibility on paper but this flexibility is eliminated by the verbal instructions given by the lecturer.

The lecturer announced early in the interview that there is no room for further development. This is indicative of unwillingness to develop it or possibly inability to imagine future evolution of task, of the profession itself, or of the education of it. The lecturer reiterated throughout the interview that any changes to accommodate the students might be a waste of time.

There seems to be some general belief among the lecturers who teach this module that all students are of the same level of digital competencies (Passey et al., 2018), and can handle technical problems on their own. However, the programme includes students from different educational backgrounds. One suggestion that can be made here is to ask one of the students who has already taken this module, and who has shown good command of the software, to give a workshop to students who are currently taking the module. Upon making this suggestion, the lecturer pointed out that this is a third (final) year module and students graduate afterwards. Nonetheless, I suggested that agreements could be made with current students to give a workshop on OneSource to the new students. The lecturer commented that this could be a doable arrangement and said it could be helpful and that he would look into it further.

There is a limit to choices offered to students. Ryan and Tilbury (2013) cite a possible explanation:

> "Where extension of 'choice' and an expansion of delivery logistics is the only consideration driving the development of flexible learning pathways, flexibility as a pedagogical concern

> can be sidelined or absent amidst a focus on issues such as efficiencies, competitiveness and access (DeBoer & Collis 2005; Kirkpatrick 1997).” (Ryan and Tilbury, 2013; p.8)

I think this quote explains some of the restrictions in the taxation course work. There is more focus on efficiencies, competitiveness and access (e.g. eliminating freedom of choice of software by restricting students to the use of MS Office to suit external examiners’ *anticipated* preferences). The competitive element in this coursework is focused on how to get students to show employers that they are trained on MS Excel and OneSource software to give students a competitive edge. However, by not including other software, students are being limited to the affordances of this software, which limits their ability to understand different varieties or imagine different ways to handle the task. If we hope to encourage students to be ‘future facing’ with the ability of thinking of alternative ways of solving problems (Cope and Kalantzis, 2008; Ryan and Tilbury, 2013), then we need higher exposure with an element of critical evaluation of alternatives. If not within the same module, then within different modules. Possibly one can suggest adding one more task for the students, which is to list what other software is available and produce a comparison/contrast table featuring the main functions and affordances. This way students would learn about the different affordances of software and possibly be more dynamic in their thinking and problem-solving approach. It can also help keep the lecturers more updated about technological developments in the field of taxation software. This could also contribute to shifting power dynamics and allowing students to co-create knowledge, possibly beyond what the lecturers already know.

In terms of pace, place and mode, the three flexible learning territories, the coursework allows students to set their own pace. It is introduced in week 4 and submission is at the end of the academic year (week 24). Work on the coursework can be done anywhere except for the task on OneSource which has to be done in a particular computer laboratory where the software is installed. As for mode, there is no flexibility since particular modes are prescribed for students (MS Word document, MS Excel sheet/report, OneSource calculations). This could possibly be due to lecturers' lack of flexibility.

> "flexibility can and should be considered as an attribute of both learners and educators" (Cope and Kalantzi, 2010; p.8)

The kind of pedagogical approach that should be implemented is one that should equip learners with the ability to think and act in a flexible way, particularly when responding to issues beyond HE. An example of this is the incident of the student who found a way to use MS Windows on a Mac computer which shows more flexibility and resourcefulness on the part of the student as a response to the lack of it on the part of the lecturer.

5.8.2. Logical Database Design

5.8.2.1. General description

The assignment of database design is for level 2, first year students of the Informatics and Security Programme - Database Systems module. It is based on the topics and skills taught to students in the first term of the semester.

Students are required to demonstrate ability to make a Logical Database Design and draw an Entity Relationship Diagram (ERD). The task is based on a scenario of an engineering company that provides design and build services. Students were taught techniques like normalisation and ERD which are used when designing a database application and are expected to show ability to carry out similar tasks on their own (in pairs). The lecturer explained that this is a straightforward task that needs direct implementations of the basic concepts covered in class. Students are prepared and have all the required knowledge to carry it out. The assignment seems to be more procedural than creative and requires simple following of instructions. In spite of that, the lecturer commented that students usually score average or below average grades.

5.8.2.2. Assessing the seven FUAD principles

Students are given some choice of tools to use for completing the assignment (FUAD 1). They use their own devices and can download whatever software they need, so that they can work from anywhere they wish.

> *"*If they have their own machines then they don't have to worry about finishing it in a certain time period. They can keep working on it even at home or outside the class."

In part B of the assignment, students are given a number of choices for submitting the diagrams.

> *"*For the second part, they have to draw the ERD diagram. That could be done through Visio or through any software; there are tons of different freeware available. They can create it in any

software and they can take a snapshot and put it in that Word document."

The only specification required here is that submission should be in MS Word. Although this might seem a restriction, it should not create any problems or cause any difficulties since the students are all IT students and have enough IT knowledge to manage. The lecturer explained that MS Word 365 is compatible with any device and students have free access to it. Therefore, it cannot be considered as a restriction.

There is no choice of product or choice of procedure as the assignment requirements are quite specific and all students are expected to produce the same answers. When asked about why this is, the lecturer explained that this assignment deals with the basic concepts that have to be mastered before any creativity is invited. The lecturer explained that the following assignment would be about an upcoming trend in the field but this one is more about the basics.

Students neither have any input in the marking criteria (FUAD 2), nor do they use the available marking criteria for peer assessment. The lecturer explains that they do this activity (peer assessment) in another assignment but not this one due to lack of time. This element (time restriction) is recognised as an inhibiting factor.

The assignment document is detailed and prescriptive to a large extent (FUAD 3), and the final product is specifically required to be in MS Word. The lecturer's view is that this particular assignment has to be specific because it requires the students to perform basic skills. Students are not invited to think

about alternative future scenarios. All students are expected to give the same answer. Since this is the premise of the lecturer, then the assignment is as it should be and there is no room for generic description that allows more options and more choices.

Some of the software recommended for this assignment is quite specific, e.g. MS Visio or MS Word. Both suggestions have downloadable versions compatible with different devices (FUAD 4). The alternative option is hand-drawing.

Students are instructed to work in pairs because lecturers in this college believe that pair work and group work are always recommended for the sake of helping students learn teamwork and communication and collaboration skills (FUAD 5). This is based on the feedback from companies where students do their internship. These skills are in high demand in the job market. The pairing is based purposefully on a student's preference of who to work with. The lecturer explained that the two students need to be able to work together and not have conflicting schedules. Therefore, it is important to let them choose who to work with.

> "Collaboration and communication skills are again one of the biggest things that we teach in our program… If a big task is assigned to them then they should be able to break it down and have the work done partially, in collaboration with another, give their suggestions, listen to another person's feedback on their suggestions."

Access (FUAD 6) to the software recommended for this assignment is made available to students.

> "all the software are provided by the college… and we kind of train them on those softwares. Microsoft Visio is one of the softwares that we use for designing purposes. We use Microsoft SQL Server which is our database managements system. We use Visual Studio for a couple of things and all of these softwares are available on all of the campus machines… Not only that, the college has also made all of these license softwares available for them to download and it's all on their home computers."

Whichever tool the students use, support is available through a number of channels. For example, the lecturer gives an introductory demonstration of MS Visio, gives other options for hand drawing and also suggests other freeware while at the same time providing handouts about tutorials on how to use the software. The lecturer identifies these IT skills as not the goal of the course, rather it is to teach the concepts.

The whole programme is designed to give students work experience while studying (FUAD 7). This is through the programme of internships that students take. Assignments are generally designed in a way that takes into consideration the feedback that comes from the companies where students get their work experience. Therefore, students work in pairs to help them develop important job-related skills such as communication, collaboration,

documentation and project management skills. These skills are required in the job market and the feedback from the companies expressed a need for further development of these soft skills. Assignments in general, like this one, simulate real-job tasks. Furthermore, students pay attention to ways in which the task may vary in different situations in the real world.

> "It's kind of educating them that that's how you're going to resolve the issues in the real world. So, documentation is very important; keeping track of everything you're doing… planning and project management."

5.8.2.3. Enablers and inhibitors

The lecturer identified providing access to software (FUAD 6) as an important enabler. Making all required software available for students, both to use within the computer laboratories and to download onto students' own laptops enables students to work anywhere, anytime. Moreover, the lecturer believes that creating connections between the concepts, how they will recur in the coming semesters and in the job market (FUAD 7) is also enabling students to better retain their learning.

> "They'll be using the same concepts in a couple of other courses, so whenever we teach it, especially in the lower semesters, we try to connect it with what they will be doing in their higher semesters and how and when they will be revisiting those concepts, so they can kind of retain it. Another enabling factor is, every time I give them this work, I connect it with the

> job market. So when you'll be working in so and so role, you'll be using this skill or you'll be coming across this kind of work."

However, time restriction is an inhibitor. The lecturer expressed that if they had more time, she would have enabled peer learning and active knowledge construction (FUAD 5).

> "it would be nice if every student can have access to the solution of the other student and exchange and comment and get the ideas behind as in why you did this and not this, but again, time! So, time could be an inhibiting factor in that scenario for me."

5.8.2.4. Discussion and suggested improvements

Due to the fact that this is a highly procedural assignment, suggesting improvements would need more investigation. Generally speaking, the assignment adopts a scenario that simulates real-life situations. It would be interesting to see if it is at all possible to use an existing scenario from a real company, possibly one of the companies where students go for internships. This would make the assignment more authentic and situated.

Moreover, activating peer feedback could be designed in a way where students submit two copies of the assignment, one to the lecturer and one to a peer with specific instructions on what feedback is required. This way, peer feedback happens at the same time marking is taking place which saves time.

5.9. Summary

This chapter presented an analytical discussion of the evaluations conducted in this research. Each learning experience was presented as an example of one of the FUAD principles, along with an evaluation and discussion of the remaining principles. Each evaluation is followed by possible suggestions that could enhance the assignment. In some cases the suggestions were accepted by the lecturers, while in other cases, the suggestions were implemented and feedback retuned to show the effect of the implementation. In the following chapter, a bird's eye view of all evaluations will be presented to enable a discussion of individual FUAD principles. Connections will be made between enablers, inhibitors and principles, as well as how context plays a role in determining the design of the learning experience.

Chapter 6 Discussion and Conclusion

The purpose of this evaluation research was to formulate then test the FUAD framework as a tool to help instigate a paradigm shift towards flexible ubiquitous agnostic design in higher education. Many theories and concepts have been discussed to point out the importance of transforming education to suit the 21st century learner. The FUAD framework functions as a translation of such theoretical concepts into seven principles for instructional design to ensure some power shift from lecturer to students and to increase student agency while at the same time minimising inequity and maximising inclusivity.

The study attempted to answer four overarching research questions:

1. How can the new pedagogies of flexible learning (Ryan and Tilbury, 2013) and ubiquitous learning (Cope and Kalantzis, 2010) underpin the strategies of Device Neutral Assignments (Campo, 2013; Milliner, 2013) to form a framework for Flexible Ubiquitous Agnostic Design (FUAD)?

2. How compatible is the learning experience under evaluation with the FUAD Framework?
3. How can the learning experience under study inform and further develop the FUAD Framework?
4. What are the limitations in achieving FUAD-compatible learning experience?

The qualitative evaluation design adopted to answer these questions consisted of an evaluation of 16 learning experiences, such as assessments, projects, presentations,

etc. Chosen assignments were from all levels of HE study, different departments and colleges, different universities and different countries. The evaluation took the form of interviewing the lecturer who designed the learning experience as well as examining any relevant documents such as instructions documents and rubrics. This helped in understanding the instructional design and provided a way to validate the lecturer's thoughts and perceptions through comparing the information communicated by the lecturer about the design with the documented descriptions and instructions.

In this chapter, I will explain how the research questions were answered. The first question was answered in the theoretical framework chapter, where the seven pedagogical ideas of flexible learning (Ryan and Tilbury, 2013) and the seven moves towards ubiquitous learning (Cope and Kalantzis, 2010) were aligned to underpin the strategies for Device Neutral Assignments (Campo, 2013; Milliner, 2013). As for the second question, the findings chapter shows how the FUAD framework functioned as an evaluation tool to examine how compatible each assignment was with the FUAD principles. It also helped inform the development of each assignment with possible solutions to some identified problems or suggestions to help improve the assignment. Some of the suggestions were implemented and positive results were communicated by the lecturers.

For the third research question, I will show in the following sections how the evaluated learning experiences informed each of the FUAD principles through discussing each principle across assignments and linking the findings to the existing literature. This includes a discussion of how the findings informed the FUAD framework in a number of ways. First and foremost, the principle of authenticity and situated learning was added through the repeated references in the interviews to the

value of authenticity and situatedness in the assignments. The evaluations also provided some new insights such as the importance of context (of university, department and module) and culture (of lecturers and learners) in designing a learning experience. Additionally, the evaluation informed about the fourth research question regarding some important limitations or inhibitors to the full implementation of the FUAD framework. Such limitations included procedural tasks, approaches by external examiners, time restrictions, and student numbers. Section 6.9 contains further discussion to help answer research question four.

Context of the assignment is another element that may limit the implementation of some principles. It is important to look at the assignments holistically and situate each one of them within the context of the department, institution and the student body. In doing so, the evaluator can make better sense of how each FUAD principle is represented, why some principles are not, and whether it serves the module outcomes to suggest the addition of missing principles. This is in line with Saunders's (2012) views on how evaluation use is context relevant. The framework functions as a set of indicators that show the degree of flexibility and power shift needed to achieve increased student agency. In that sense, FUAD principles form a framework that functions as a pointer to possible indicators of flexible, ubiquitous and agnostic learning.

The following sections provide a discussion of how each principle was represented in the evaluated assignments, whether it was implemented, lacking, not needed, and the lecturer's perspective on it. The discussion will also be linked to the previously highlighted literature. The discussion focuses on the set of 16 assignments and is not meant to be generalised. I maintain that each assignment is a unique case that can

provide some indicators and issues for discussion and the FUAD principles are negotiable based on context. Nonetheless, I think the process of applying the FUAD framework as an evaluation tool is generalisable.

6.1. FUAD principle 1: Allowing choice of product, tools and procedure

Allowing choice can be manifested in a number of ways. It can be in terms of assignment product, tools and procedure such as in assignment 5.1.1 Smart object prototype or it can be in terms of choice of content, procedure, and tools rather than product type such as in assignment 5.1.2 Anatomy video. However, the most important concern is the justification behind offering such choices to students and how it would lead to achieving the module outcomes. Sometimes it is important that the product is specified such as in 5.8.1 Principles of taxation coursework where students needed to show proof of their capability to calculate taxes in a specific way, or in the 5.8.2 Logical data base design assignment where students were being trained on a particular job-related skill.

Not all lecturers are equally accepting of multi-modal assignment production or representation. Some lecturers value conformity such as in 5.3.2 Retail design concept assignment in 5.5.1 Public area design concept, and in 5.8.1 Principles of taxation coursework where conformity was for the purpose of facilitating assessment by external assessors. It is also noticeable that lecturers who have more digital competence are more flexible when it comes to allowing choices. The assignments that were designed by IT lecturers or lecturers who had an IT background (5.1.1, 5.2.2, 5.4.1, 5.4.2) offered more multi-modal, multi-platform choices to students.

6.2. FUAD principle 2: Co-constructing success criteria

This principle was the hardest to find in assignments. It also seemed foreign to lecturers and revealed some misconceptions about what it entails. Lecturers felt that students are not mature enough or not aware enough to be able to set the assessment criteria. This showed a misconception among lecturers because they were under the impression that the students set their own success criteria, whereas the principle is more about inviting student input into the construction of the success criteria rather than creating it on their own. The lack of acceptance of this principle also means that the power dynamics between lecturers and students still places the student at the lower end of the power pyramid.

These challenges were similar to the ones anticipated by the Ontario Ministry of Education (2010a - Learning Goals). The case is also similar to a study conducted in Australia, where Wanner and Palmer (2012) found that 85% of the students believed that it was either important or very important to have input in the creation of success criteria; however, 65% of the lecturers believed that students should not have choice in it while 32% said they would allow some choice only.

There is also a need to clarify the distinction between success criteria and marking criteria or rubric. The first step in this principle is to co-construct the success criteria or co-construct the meaning of each written criterion, then develop this into a rubric where the success criteria are listed and explained in

a language students can easily understand (Ontario Ministry of Education, 2010b - Growing Success)

Fifteen out of the sixteen assignments did not have this principle in them. However, one lecturer decided to try asking her students to co-construct success criteria for their assignment (in 5.2.2 Vocabulary video assignment) and the results were positive. In the remaining assignments, most lecturers felt that the idea of co-constructing success criteria was not suitable for students. However, in some other assignments, other forms of co-construction were found such as sharing the success criteria and discussing them with students, peer-marking based on shared criteria, and voting on assignments as a way of evaluating them.

There was also a general feeling that formative assignments do not need success criteria as such, while summative assignments are too formal to allow student input in them. The PGCertHE presentation assignment (5.2.1) offered the argument that trainees were lecturers themselves and are capable of producing or negotiating suitable success criteria. However, the lecturer pointed out that the same exercise was used with undergraduate students to help students and lecturers reach a common understanding of existing success criteria. In this case, the meaning was co-constructed rather than the criteria themselves.

6.3. FUAD principle 3: Generic assignment description

Assignment instructions are usually found as a text document, which may be complemented or explained through further oral instructions. The main purpose of this principle is to expand the options of representational modes. If students are to be given choices and enjoy flexibility (Ryan and Tilbury, 2013), as well as be allowed a mix of representational modes and embrace learner differences (Cope and Kalantzis, 2010), then the instructions, both written and oral, should be generic enough to allow for such flexibility and neutrality.

Upon evaluating the sixteen assignments, it was observed that sometimes the written instructions contradicted the oral instructions conveyed to students by the lecturer. For example, instructions of assignment 5.1.1, Smart object prototype, specify uploading the video to YouTube but when asked about it, the lecturer explained that she does not require YouTube in particular and students can use any other platform. On the other hand, the instructions of assignment 5.8.1, Principles of taxation coursework, are quite specific. It requires specific products using specific software and no flexibility is shown. The justification is that such specifications were to facilitate involvement of the external examiner. The two assignments from the College of Fine Arts and Design (5.3.2 and 5.5.1) are both characterised by specific assignment description also for the sake of external examiners and institutional requirements. The radiology case study assignment 5.6.3 likewise has specific description because lecturers wanted conformity and equality between students.

6.4. FUAD principle 4: Platform agnostic services

The more the lecturers have digital competency, the more they are aware of the importance of platform agnostic services. It was clear that the most agnostic assignments were the ones designed by IT lecturers, such as assignments 5.4.1 and 5.4.2. in assignment 5.4.1, the App design project, the lecturer took extra steps to ensure that the software they provided to students were platform agnostic and allowed collaboration. Taking into consideration how students work within an ecology of devices (Reid and Pechenkina, 2016; Pachler, Cook and Bachmair, 2010), the lecturer identified that one of the enabling factors of this assignment was the fact that students could collaborate and work on the assignment using their own devices because the software chosen for them works on any device and any operating system.

Assignment 5.4.2. Arabic language integrated assessment also operated under similar assumptions. Students were required to work on their assessment during the winter break. They needed to use their own devices. Hence, the lecturer, who has a degree in IT, chose an agnostic cloud platform to enable students to use their own devices while working on the assignment. Not subscribing to a particular platform can be seen as a step towards the decolonisation of education (Ryan and Tilbury, 2013) and is compatible with ubiquitous learning (Cope and Kalantzis, 2010) where devices are ubiquitous and of various types and kinds.

In the assignments that were not platform agnostic, such as the two assignments from the College of Fine Arts and Design, the two assignments

from the radiology department and the coursework for Principles of taxation, the lecturers had working knowledge of IT and average digital competency. This was clear from the way they discussed technology provision to their students and from their perceptions about what works and what does not. Therefore, they were careful to set the assignment in a highly prescribed manner to reduce any issues that might arise from multi-platform services.

6.5. FUAD principle 5: Social, collaborative, knowledge construction

One of the most important enablers of the Mini-conference presentation assignment (5.2.1) was the fact that trainees shared experiences with each other and constructed their individual assignments through collaboration and peer support. This truly helped in creating a 'culture of co-curricular learning spaces, informal learning and social interaction' (Ryan and Tilbury, 2013; p.26) that aided trainees and enriched their learning which led to improved performance in the assignment. Similarly, in assignment 5.1.1, Smart object prototype, the lecturer emphasised how working in groups as well as benefiting from open source innovations by other people helped to increase students' learning. This is an embodiment of Ryan and Tilbury's (2013) flexible pedagogical idea 6 of social learning beyond the classroom through contextual mobility, collaboration and crossing boundaries. It also embodies ubiquitous learning moves 3 and 7 of recognising learner differences and creating a collaborative knowledge culture.

However, in the same assignment where FUAD 5 was considered an enabler, it was also considered as a possible inhibitor. The lecturer mentioned a

commonly-pointed issue with group work which was the possibility of some students depending on other group members to do the work for them. The problem of free-riding or unequal participation among group members is a common problem. Nonetheless, there are a number of well-documented and tried solutions, such as group managing and monitoring, setting group norms, assigning roles, providing opportunities to identify individual work within group work, and peer evaluation (Wilson, Brickman, and Brame, 2018). FUAD 5 can also be challenging in online learning situations such as in assignment 5.1.2, Anatomy video project. One of the challenges was that students were distant learners and could not establish the social aspect in the course. Therefore, collaboration on a video project seemed challenging to them.

6.6. FUAD principle 6: Accessibility to technology and skills support

An important enabler is when an institution supports technology enhanced learning. When technology is available and is well supported, students feel more enabled. In assignments 5.1.1 and 5.2.2, lecturers identified that providing technology and software to students enabled them to perform the assignment well, and in assignments 5.1.2 and 5.8.2, the skills support provided to students was a main enabler. As for the Sustainability leaflet assignment (5.6.1), the lecturer reported improved assignments after students were given digital skills workshops on how to use a particular software to produce the assignment.

Lecturers also identified that the lack of skills support affected students' performance and quality of assignment. In the PGCert HE presentation (5.2.1),

the lecturer mentioned that it had always been evident that trainees needed support in digital literacy skills. The same applied for assignment 5.3.2, where the lecturer said that students used to perform better when they had a dedicated laboratory instructor that gave tutorials and support on design software.

However, the argument in the literature review chapter (section 2.3.2) regarding how providing technology may not completely solve the equity and inclusivity issue and may reduce neutrality (AlOkaily, 2015c) was evident in assignment 5.7.2, Private cloud platform. The students in that assignment were provided with computers but they struggled to obtain administrator rights in order to implement the requirements of the assignments. They had to go through a time-consuming process of applying to gain administrator rights, which in turn needed agreeing to the terms and conditions of the institution.

6.7. FUAD principle 7: Authenticity and situated learning

This particular principle found its way into the FUAD framework based on the information communicated by the lecturers about their assignments. The theme of authentic and situated learning started to come out strongly from the early interviews. Lecturers explained how they designed the assignments to reflect real-world job experiences or situations, either through alliances with industries or through simulations and scenarios of real-world situations. Lecturers also reported that the more the assignment is authentic, the more students were engaged and motivated because they see the direct relevance

with their future jobs. This confirms the point Looney (2009) noted regarding how students prefer authenticity in assessments.

The most authentic assignment was 5.7.1 PID for Expo 2020 where the lecturer situated the project management assignment in an important current event - the Expo 2020. Similarly, the 5.4.2. Arabic language integrated assessment was also authentic and situated since students were required to write an article about a current issue, then conduct interviews with people discussing the current issue they chose to write about. This provided authentic practice of the language with people outside the classroom. The Public area design concept (5.5.1) and the Radiology case study assignment (5.6.3) were both situated in the real-world outside the classroom and both lecturers reported high student engagement.

There are many more examples where students gained information from companies (5.7.1) or feedback on their work from experts (5.4.1), or researched real-life situations and suggested solutions (5.2.1 and 5.6.1). The element of authenticity was clear and was identified by the lecturers as an enabler because of how relevant it was to their future jobs. This is in line with ubiquitous learning which promotes creating formal learning environments outside the classroom and in real and virtual worlds (Shih, Chu, Hwang and Kinshuk, 2011; Ogata and Yano, 2004). Authenticity also helps the development of megacognition, which leads to the development of the expert learner (Passey, 2014) because without context, as Lave and Wenger (1991) believe, it becomes harder for the mind to explain the learning activity.

Therefore, authenticity and situated learning were added to the FUAD framework to prompt designs to be more authentic and situated whenever possible.

6.8. Culture

Two lecturers pointed out that what was preventing them from extending choice, flexibility and most importantly, inviting co-construction of success criteria, was students' culture. They believed that students are not trained to take responsibility and only appreciate highly-structured, over-prescribed assignments. They also mentioned that students lack the required maturity to contribute to the success criteria. This was noted in assignment 5.4.2 Arabic integrated assessment, 5.3.2 Retail design concept and mood board and assignment 5.5.1 Public area design concept.

This particular point about culture could be argued both ways. Students' culture and previous educational norms may not have prepared them for such a power shift or agency. At the same time, giving students more ownership of the assignment might contribute to instigating change in the cultural or contextual factors. Although this research is an investigation of flexibility on the assignment level, it is clear that flexibility needs to be implemented on a broader scale in order to create a culture of flexibility.

6.9. Limitations to and inhibitors of FUAD principles

There were four main themes identified across assignments that function as inhibitors to flexibility from the lecturer's perspective. These were procedural tasks, external examiner requirements, student numbers, and time restriction. Some highly-procedural and over-prescribed assignments were noted to have restricted flexibility and creativity on the part of the students. These were assignment 5.8.1 Taxation principles coursework, 5.8.2 Logical database design, 5.6.2 Reflective journal, and 5.6.3 Case study. The lecturers mentioned that the assignment was designed to reflect the procedures that would be required from students in their future jobs. Lecturers wanted conformity among students, therefore assignments were described in detail. The premise was that conformity is the safest route with an external examiner. In addition to that, due to time restriction, prescribing the assignment and the sources was viewed as a positive approach and as a means of support for the students because it saved time (example assignments: 5.3.2 Retail design concept, 5.6.2 Reflective journal, 5.8.1 Taxation coursework, and 5.8.2 Logical database design).

Furthermore, lecturers felt that student numbers did not allow much flexibility because the more students there were in a class, the more difficult it became to provide support or experiment with new pedagogical ideas (example assignments: 5.1.2 Anatomy video, 5.6.1 Sustainability leaflet, 5.6.2 Reflective journal, and 5.8.1 Principles of taxation). It also becomes more challenging to grade assignments.

One important theme was assessment by external examiner. When lecturers design the assignment, they take into consideration the views of the external examiner. For example, in the Principles of taxation coursework (5.8.1), the lecturer felt that they should limit flexibility in product type as a precautionary step to make it easier for the external examiner. Similarly, the retail design concept and the public area design concept assignments were equally highly prescribed to minimise misunderstandings or misconceptions with the external examiner. On the other hand, it was because of previous difference in perception regarding what is required in an assignment that the Mini-conference presentation assignment (5.2.1) was designed so that students co-constructed the success criteria and discussed them with assessors so that all parties involved in the assignment had a shared understanding of the requirements and the success criteria.

6.10. Limitations and future research

The number of assignment evaluations for this research was originally planned to be a minimum of 10. Patton (1984) points that limiting the data affects the depth of evaluation, yet increasing the number can become time-consuming and financially costing. The data sets were increased to sixteen assignments instead of ten. By the sixteenth assignment, the data seemed to start to be repeated, with little new insights and saturation was being reached. However, it is still a limited number, which makes it difficult to make a firm generalisation.

Another possible issue is what Gray (2004) points to in terms of validity, reliability and objectivity. The evaluations were based on the lecturer's

narrative and on the assignment documents, which may or may not have been created by the same lecturer. I sought to bracket my own set of beliefs and values so as not to affect the interpretation of information communicated by the lecturers or found in the documents. Therefore, I was accepting of new ideas, such as adding authenticity and situatedness and of expanding existing ones such as adding choice of procedure, tools and resources to the originally planned choice of product. Additionally, I now see that it is acceptable not to include one or more of the principles in a learning experience. Designing learning experiences through the lens of FUAD is a process that needs to adapt to the educational context of the learning experience. Application of the seven principles can be negotiable and flexible, and has the main purpose of instigating a paradigm shift towards flexible, ubiquitous, agnostic instructional design.

This evaluation research was based on the analysis of learning experiences through the informed views of lecturers. The students' perspectives were not included, except in instances when the interviewee reported on how students felt about or dealt with an assignment. This could be limiting to the research; therefore, future research should focus on adding the student perspective and samples of students' work. Once this is done, it is possible to gain a clearer idea of the FUAD framework. Additionally, evidence needs to be collected after implementing the recommendations that resulted from the evaluation, to see the effect of such implementation.

Institutional and legal considerations need to be addressed in each context when implementing the FUAD framework. As the framework promotes the

production of knowledge, the intellectual properties of copyrights and patents need to be respected. Sun and Baez (2010) describe three main factors that affect HE intellectual property policy - technological advances, competing interests, and legal parameters - which are contextualised within economic, political and social aspects. A full consideration of these aspects is beyond the scope of this study; however, they are noted as important considerations that need to be assessed in each context. This links to the idea that implementing FUAD principles will need to be negotiated within each context in a way that respects any legal or regulatory considerations. For example, implementations in the UK will need to comply with the General Data Protection Regulation (GDPR) (ICO, 2019).

Similarly, with increasing international legislation on accessibility with regard to the Internet and resources, further research on inclusivity and accessibility of people with disabilities is needed. The FUAD framework could be more informed on how the use of some software does not provide for accessibility to the same extent as other software (e.g. Prezi versus MS PowerPoint) or how Internet resources have not been made accessible for individuals with disabilities (Burgstahler, 2002; Seale, 2013).

6.11. Conclusion and final thoughts

Some of the lecturers' perceptions about the need to limit flexibility are quite understandable. Each institutional context has its own requirements and procedures. Sometimes certain steps need to be taken to make the learning experience more compatible with different rules and regulations of different institutions. What the FUAD framework helps with is to flag the importance of

flexibility, creativity, and student agency among other important aspects. The seven principles of the FUAD framework functions as a reminder of elements that can make a learning experience more compatible with educational pedagogies of the 21st century, characterised by flexible and ubiquitous learning.

The main contribution to knowledge here is the formulation and testing of a framework that supports agnostic design. It has been tested in practice, and provided support to lecturers in their endeavour to move towards designing TEL experiences. The FUAD framework translates new pedagogies into practical principles that ensures a more agnostic and inclusive design.

It is important to note that not all FUAD principles need to be present in each learning experience. It depends on the set of skills required, the learning outcomes, or how the task is represented in the real world. Moreover, contextualising the assignment within the module, the department and the institution is equally important. Sometimes a principle may not exist in one assignment but is well represented in another assignment within the programme. Therefore, the FUAD principles should be negotiated in learning experiences and not viewed as a list that needs to be implemented in its totality. It has been found from the evaluation that this framework can instigate a reconsideration of some educational design aspects and make lecturers more conscious of educational designs they may have used and question them to see if some modifications are possible.

In this research, the FUAD framework functioned as an evaluation tool that helped focus attention on the main areas of flexible, ubiquitous learning. It provided a method for systematic examination of the key features that represent an educational paradigm shift. Through assessing the 7 principles in the design of learning experiences for students, it became possible to identify and suggest certain ideas that have helped to improve the learning experience.

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