A professional development programme for supporting teachers in the design,

development, and implementation of Technology Enhanced Learning activities for

teaching Arabic as a foreign language

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Declaration

This thesis results entirely from my own work and has not been offered previously for any

other degree or diploma. I declare that the word-length conforms to the permitted maximum.

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Abstract

The purpose of this two cycles design-based research study is to explore the approaches with response to and perceptions of teachers towards a professional development programme (PDP) for enabling them to design, develop, and implement technology enhanced learning (TEL) activities for teaching Arabic as a foreign language (AFL). The PDP was designed with reference to Laurillard's (2002) conversational framework and Passey's (2011) learning elements framework.

Semi-structured interviews, online open-ended questionnaires, and observations are used for data collection. The results are analysed and presented visually and in text to show different levels of detail. The findings identified teachers' positive and negative perceptions towards the support elements provided throughout the PDP in addition to: 1) their pedagogical outcomes in relation to the different types of support provided; 2) the positive influencers and barriers that affected them throughout the PDP; 3) their produced outcomes (artefacts); and 4) their students' responses from their perspectives. The design principles of a successful implementation of a PDP were also included based on findings.

Finally, this study attempts to assist PDP designers by referring to the theoretical and practical implications that can help them in designing similar programmes. In addition, originality in terms of the design, development, and implementation of the PDP are highlighted, so adding to the learning design body of knowledge with respect to foreign language learning.

Keywords: professional development, learning design, conversational framework, support, teachers' training, design-based research

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Chapter 1: Introduction and background

This chapter focuses on: 1) background and context; 2) the problem statement; 3) statement of purpose and research question; 4) research approach; 5) role of the researcher; 6) rationale and significance; and 7) definitions of key terminology used in the study.

1.1- Background and context

This study takes place in an Arabic as a foreign language instruction department (ALI) at an independent non-profit English language international university in Cairo (an educational organisation). The ALI department as part of this university was established in 1921 and is fully accredited in both the United States and Egypt. The university is in an Arabic-language country and therefore all degree and non-degree/study abroad students should learn Arabic. Degree students (undergraduates and graduates) are the ones seeking a degree from the university, while non-degree/study abroad students are the ones not seeking a degree from the university, but they want to take certain academic credit courses. Students can apply for the following four ALI programmes:

1) Arabic language intensive programme (ALIN) offers both Modern Standard Arabic (MSA) and Egyptian Colloquial Arabic (ECA) intensive courses at all levels: novice, intermediate, and high. The courses involve 20 to 25 contact hours a week and are only for international students who want to study Arabic.

2) Arabic language for study abroad students programme (ALNG) offers both MSA and ECA of all levels (as above), but is mainly for degree and non-degree international and Egyptian students (graduates and undergraduates). The courses involve a minimum of 5 hours a week for students to fulfil their Arabic language requirements.

3) The Center for Advanced Arabic Study in Cairo programme (CASA) offers tailored MSA and ECA courses with the same levels and contact hours as ALIN, but for advanced Arabic language international students only.

4) Arabic language intensive programme for diplomats (ALID) offers both MSA and ECA with the same levels and contact hours as ALIN, but for international diplomats.

In addition to the above programmes, there is the computer aided language learning unit (CALL) which is responsible for training teachers from all the above programmes on how to integrate technology in teaching Arabic as a foreign language (AFL). It is also responsible for developing and designing interactive-technology software programs for teaching AFL.

The above programmes are not situated on the same campus, but rather distributed across two campuses that are approximately 38 kilometres apart. For instance, the ALIN and ALNG that are under one director, in addition to the CALL unit which has its own director, are on the new campus, but the ALID and CASA, that have two different directors, are on the old campus. The new campus is the main one, where 36 undergraduate, 44 masters and two PhD programmes of the university are situated. In addition, all classes on this new campus are considered "smart", since each teacher has access to a computer and a projector. Aside from these smart classes, the ALIN programme classes in the ALI department have a teacher laptop, projector, document camera, sound system, television, and students' laptops. These classes are smaller compared to other university classes and they are more technologically provided, because the director of the CALL unit in the ALI department at the time when the new campus was founded applied for a grant to furnish the classes with this level of equipment.

The ALI consists of twenty-one full time teachers including four directors and a department head. They all teach fifteen hours a week except for the directors who teach only ten hours a week leaving five hours for administrative work. In addition to the assigned teaching load which might be distributed across the two campuses, teachers prepare material, correct assignments, attend workshops, and undertake university services.

1.2- Problem statement

Teachers of AFL do not have adequate support to design, develop, and implement practices with digital technologies; this statement is based on the fact that there is not sufficient time for them to integrate technology in their teaching through designing, developing, and implementing technology enhanced learning (TEL) activities when they receive only one-hour training course every two weeks. A similar problem was reported by Asensio-Pérez et al. (2017) regarding how short workshops are not sufficient for achieving their goals.

These one-hour training courses have been conducted by the researcher (who is the CALL unit director) in a room designated mainly for training courses. This room is spacious and has around twenty computers, a projector, and a teacher laptop. The focus of these training courses is to give brief overviews of software programs for designing and developing TEL activities for teaching AFL. From observing the target context, from this direct experience, the key issues that teachers face in the target context are:

1. Not having time to communicate their needs or to ask questions.
2. Not knowing how to integrate technology effectively in their classrooms even after the training courses they take and not knowing how to relate what they take in the training course to the classes that they teach.

3. Having different working hours and being on two different campuses limiting the opportunities to attend the training courses.

4. Forgetting what they take away because there is neither feedback nor time to practice in a one-hour training course.

Based on these experiences, teachers are not benefiting from such training courses and they do not practice what they take away, although practice is considered the most valuable learning resource (Wenger, 1998). As a result, they need more support to enable and motivate them not only to design and develop TEL activities, but also to implement them in their teaching practices.

1.3- Statement of purpose and research question

Teachers are one of the most important catalysts behind the success or failure of any educational innovation (Kirschner, 2015) and finding ways to support them is clearly important. To support them in designing TEL activities, they may well need to receive professional development practice (Laurillard, 2012) with certain types of support that includes information, guidance, and advice to use technology effectively in education.

To that end, the researcher is motivated to conduct this study, by designing, developing, and implementing a professional development programme (PDP) that provides appropriate support and motivation for designing, developing, and implementing TEL activities. However, before applying the PDP, it was important to initially collect ideas of teachers' needs to optimise the design to the target context, as a misalignment between the PDP and teachers' needs can lead to limited success (McKenney, Kali, Markauskaite, & Voogt, 2015).

But even designing and developing a PDP that takes into consideration the supporting elements that lead to integrating technology effectively in teaching does not guarantee

success. For example, Wenger (1998, p.233) previously stated: "There is an inherent uncertainty between design and its realisation in practice, since practice is not the result of design but rather a response to it." Accordingly, the aim of this study is to explore teachers' perceptions/responses to the PDP (intervention), in terms of an overarching research question (RQ) and six sub-research questions:

Overarching RQ: What is the response (perceptions and outcomes) of AFL teachers in an international university in the Middle East towards the PDP specifically developed to support their needs?

1. Sub-RQ1: How did teachers perceive the PDP?

2. Sub-RQ2: What types of pedagogic outcomes are produced and how do they relate to the ways that teachers used different forms of support?

3. Sub-RQ3: What are the positive influencers and barriers that affected teachers throughout the PDP?

4. Sub-RQ4: How did teachers respond to the PDP?

5. Sub-RQ5: What are students' responses towards the TEL activities from teachers' perspectives?

6. Sub-RQ6: What are the design principles of an effective implementation of a PDP?

1.4- Research approach

This study aimed to solve a contextual problem by meeting teachers' identified learning needs by providing them with appropriate support that will enable them to design, develop, and implement TEL activities. For this pragmatic purpose, the researcher used a design-based research (DBR) approach.

1.5- The researcher work experience and educational background

Concerning work practices and experience in the target context, the researcher has been working as a teacher and CALL director in the ALI department since 2009. She teaches AFL for ten hours a week and her administrative work includes one hour every two weeks to conduct training courses that inform teachers about software programs that they can use in designing and developing TEL activities for teaching AFL. Concerning her educational background, she has: 1) a Bachelor of Science degree in computer science and information systems from 2002; 2) a Master's degree in teaching Arabic as a foreign language from 2010; and 3) a Master's degree of education leadership from 2016.

The researcher's work experience and basis enable her to:

- Know about the culture of the target context.

- Understand AFL teachers' needs.

- Be aware of AFL courses and the variety of students the teachers teach.

- Approach teachers within their course contexts and as a part of their desire to develop practice.

- Facilitate communication and accessibility.

- Have pedagogical, and content knowledge related to teaching AFL.

In addition, her educational background helps in:

- Knowing the software programs that work with Arabic language script and those that do not.

- Having the technological knowledge that benefits evaluating software programs that can be used in teaching AFL.

Based on her teaching experience (8 years) in the target context with the same teachers (colleagues), she considers herself an experienced insider researcher who is well aware of the target context and culture. She is also aware of the challenges and difficulties which other teachers face, so she feels she can easily put herself in their place. Also, in terms of the researcher's education background, she is equipped with technological, pedagogical, and content knowledge that can enable her to understand teachers' needs.

1.6-   History of the relationship between the researcher as an insider and the participants

Since the researcher is an insider, it is worth highlighting the history of the relationship between her and the participants when she started working in the target context back in 2011 compared to when she started conducting the study in 2017.

Firstly, when the researcher started working as a CALL director and faculty member in the target context, teachers were resistant to the use of technology in their AFL teaching for many reasons: 1) the researcher was junior at that time and new in the target context, so teachers did not want to listen to her because of the big difference in age (37 years-of-age versus 50 years-of-age and above) as learning from someone much younger and newly hired might be considered a threat to them (as that happens in many instances in the Middle-Eastern culture); 2) the teachers perceived themselves always as experienced with long years of successful AFL teaching; and 3) the teachers always acknowledged reaching their teaching goals without the need for integrating technology, which is why they neither wanted to attend the technology workshops nor change their practices.

Secondly, before the researcher started approaching teachers to contribute in the study, there was a relative institutional seniority that was built gradually over the years. This seniority provided the researcher with an established and collegial relationship with teachers in the

target context as that helped in gradually accepting listening to her recommendations regarding the importance of integrating technology in their AFL teaching. Nevertheless, they still did not want to design, develop, or implement TEL activities for reasons mentioned before in section 1.2. As a result, the researcher was sceptical about teachers' positive performance in the PDP conducted in this study and did not expect them to become engaged positively, but to keep their practice to the minimum.

Having described briefly the history of the relationship between the researcher and the participants, it is also important to highlight the opportunities and challenges of being an insider in the target context. For example, Mercer (2007) talked about that in terms of: 1) access; 2) intrusiveness; 3) familiarity; and 4) rapport. Firstly, in terms of access, the insider researcher can be easily granted access to the target context and that facilitates data collection compared to an outsider researcher who might exert more time and effort to collect data. Secondly, in terms of intrusiveness, Mercer (2007) highlighted that the insider researcher who continues performing his/her ordinary role, can have an impact in the target context compared to the outsider researcher. Thirdly, in terms of familiarity, insider researchers understand the target context and culture in addition to understanding the links between situations. As a result, the culture shock that might be encountered by the outsider researcher is avoided. Fourthly, in terms of rapport, the insider researcher has a considerable rapport and credibility with the participants of the study leading to them being open with him/her throughout conducting the study.

Based on the above, it is worth highlighting also that being an insider can lead to bias both from the researcher and/or the participants and that is why the researcher followed certain quality criteria that she took into consideration while conducting the study (refer to Table 5.4 and section 5.8 in Chapter 5).

1.7-   Rationale and significance

The rationale for this study emanates from the researcher's need as an insider researcher and experienced trainer in contact with teachers for about ten years, to solve a problem and provide a practical (but theoretically sound) solution in a context where she is aware of the background culture. This study seeks to solve the problem through a PDP that provides different types of support for enabling AFL teachers to design, develop, and implement TEL activities effectively for teaching AFL.

Knowing how to enable teachers through providing different types of support to reach the above objective could then well help other professional developers in similar contexts. That new programme knowledge could also lead to a greater understanding of teachers' needs in higher education with respect to technology integration.

1.8-   Definitions of key terminologies

For this study, Table 1.1 shows some key terminologies used.

Table1.1: Terminologies and definitions

Terminology	Definition
Support	To help teachers complete the assigned tasks throughout the PDP.
Enable	To provide teachers with means to enact assigned tasks through providing them with means and/or opportunities (support tools).

Teachers are supported to be able to design, develop, and implement TEL activities. Enabling teachers throughout the PDP is the overall goal that can be achieved by supporting them to undergo certain assigned tasks.

1.9- Summary

In this chapter, the following have been highlighted: 1) background and context; 2) the problem statement; 3) statement of purpose and research question; 4) research approach; 5) researcher experience and position; 6) rationale and significance; and 7) definitions of key terminology used in the study.

In the following chapters, chapter 2 presents a literature review that highlights key elements to provide background for the PDP. Chapter 3 focuses on the theoretical framework and its relation to the literature review, for laying down the main elements of the PDP. Chapter 4 focuses on a detailed description of the PDP elements. Chapter 5 focuses on the research design that guided the design, development, and implementation of the PDP. Chapter 6 focuses on presenting answers to the first five sub-research questions by providing a detailed level of analysis using written and visual representation of data. Chapter 7 discusses the findings of the first five sub-research questions and links them to the literature. In addition, it focuses on answering and discussing the sixth sub-research question. Chapter 8 draws a conclusion regarding each sub-research question and highlights the theoretical and practical implications.

Chapter 2: Literature review

A literature review is used for different purposes (see Bryman, 2012 and Johnson & Christensen, 2014) such as: 1) justifying the position of the research by referring to previous work; and 2) showing how the study fits into a broader picture in terms of previous empirical work. In this study, the researcher reviews the literature for these purposes.

It is worth mentioning first that transparency in describing how the studies were selected and analysed for evidence is important (Bryman, 2012). For that purpose, the researcher used a strategy developed by Booth (2006) and it focuses on: 1) sampling; 2) type of study; 3) approaches; 4) range of years; 5) limits; 6) inclusions; 7) exclusions; 8) terms used; and 9) electronic sources. Table 2.1 shows how the researcher applied this strategy for the literature review.

Table 2.1: Selection strategy

Criteria	Details
Sampling strategy	**Keywords for teachers' needs**: "teachers", "needs", "technology", "professional development", and "higher education" were used interchangeably. **Keywords for teachers' support to be TEL designers**: "learning design", "support", "technology", "teachers", "training", and "professional development" were used. In addition, prominent scholars in the field of design such as "Laurillard", "Voogt", "Van Den Akker", "McKenney", and "Nieveen" were also included in the search. **Keywords for organisational learning:** "organisational learning" and "learning organisation" were used. In addition, the keyword "Peter Senge" was also included since he is a prominent scholar in the field of organisational learning.
Type of study	Empirical peer-reviewed studies only written in English.
Approaches	The researcher read the abstracts first to make sure that they met the study objectives.

Criteria	Details
Range of years	2010 to 2018 to build upon the findings of recent studies, but only one article from 2005 was included due to its relevance to this study.
Limits	The last ten years only were included because the field of design is still emerging, and therefore the researcher wanted to inspect the most up-to-date findings. In addition, she included one article that was published in 2005 because it was cited in recent articles and was found to be particularly relevant.
Inclusion and exclusion criteria	All the studies that resulted from using the above-stated approach were included, and the rest were excluded.
Electronic sources	Academic Search Complete, and Lancaster "One search".

2.1- Learning design and teachers' needs

Learning design is an emergent field (Mor, Ferguson, & Wasson, 2015) and it focuses on perceiving teaching as a design science (Laurillard, 2012). It is the act of developing new practices, resources, plans of activity and tools with the aim of achieving certain contextual educational objectives; results are in the form of shared products and resources which are referred to as learning designs (McKenney & Mor, 2015). For teachers to be designers, they need explicit attention and appropriate support to help them in creating their own TEL material, especially when they have little experience in designing novel tasks (McKenney et al., 2015).

Integrating technology in teaching is demanding and challenging (McKenney, Boschman, Pieters, & Voogt, 2016) because of lack of support (Gronseth et al., 2010) and lack of motivation (Abuhmaid, 2011). The life of teachers in higher education does not always give them the opportunity to extend their practice to TEL designs and there can be very few opportunities to learn about TEL if they do not have time to learn from books, workshops, papers, and courses (Laurillard et al., 2011). For tackling such problems, Brennan (2015) suggested having a PDP that: 1) extends practice time; 2) pays attention to content; 3) knows about teachers' contextual needs; 4) gives access to resources; 5) encourages reflection; and

6) perceives teachers as learners. In addition, Sadaf, Newby, and Ertmer (2016) and Barak (2010) found that contextualising learning, having autonomy over learning, and providing constructive feedback affect teachers' intentions to use technology. In the same vein, Uluyol and Sahin (2016) mentioned that teachers need to: 1) be provided with different types of support while using technology; 2) see the benefits of using technology by themselves; 3) receive feedback on their work; 4) view outcomes that are of intrinsic value; and 5) have a training designed to teach certain content. In addition, Kali, McKenney, and Sagy (2015) highlighted the importance of: 1) engaging them in the design; 2) increasing their practicality; 3) increasing their ownership for implementation; and 4) increasing their learning about technology in an authentic context.

Having said that, the question that arises now is: What do empirical studies say about supporting teachers for TEL design? The answer to this question is presented in the next section.

2.1.1- Summary of empirical studies related to the current study

From applying the strategy highlighted in Table 2.1, the literature search resulted in 252 peer-reviewed studies, but after reading the abstracts, only 21 empirical studies were found directly related to this study. Table 2.2 lists the studies with their reference numbers and design objectives.

Table 2.2: Summary of empirical studies

Study reference number	Authors	Design objectives
A1	(Kafyulilo, Fisser, & Voogt, 2015)	Science lessons
A2	(Agyei & Voogt, 2012)	Mathematics lessons
A3	(Svihla, Reeve, Sagy, & Kali, 2015)	TEL problem-based lessons

Study reference number	Authors	Design objectives
A4	(Voogt, Almekinders, Van Den Akker, & Moonen, 2005)	French and German lesson plans
A5	(Alayyar, Fisser, & Voogt, 2012)	Science lessons
A6	(Huizinga, Handelzalts, Nieveen, & Voogt, 2014)	Social, economics, history, and German lesson series
A7	(Michos, Hernández-Leo, & Albó, 2018)	Mathematics collaborative activities
A8	(Nguyen & Bower, 2018)	Moodle modules and lessons
A9	(Asensio-Pérez et al., 2017)	Collaborative learning activities
A10	(Boloudakis, Retalis, & Psaromiligkos, 2018)	Moodle based units
A11	(Laurillard, Kennedy, Charlton, Wild, & Dimakopoulos, 2018)	TEL lessons
A12	(Lewin, Cranmer, & McNicol, 2018)	TEL lesson planning
A13	(Garreta-Domingo, Sloep, & Hernández-Leo, 2018)	ICT based learning activities
A14	(Ma, Xin, & Du, 2018)	Mandarin course lesson plans
A15	(Jimoyiannis, 2010)	Science lessons
A16	(Janssen & Lazonder, 2015)	Lesson plans biology
A17	(Ekanayake & Wishart, 2015)	Science lessons with mobile phones
A18	(Jia, Jung, & Ottenbreit-Leftwich, 2018)	K12 lessons and units
A19	(Kali, Levy, Levin-Peled, & Tal, 2018)	Mobile TEL science activities
A20	(McKenney & Mor, 2015)	Science and mathematics lesson plans
A21	(Kafyulilo, Fisser, & Voogt, 2016)	Biology, chemistry, physics lessons

After reviewing the 21 articles, 25 common themes were identified (referred to as C(n) where n is the theme number) and categorised as follows:

- **Phases of the TEL designed objective**: [**C1**: Design, **C2**: Development, **C3**: Implementation].

- **Data collection methods**: [**C4**: Qualitative, **C5**: Quantitative, **C6**: Mixed methods].

- **Mode of delivery**: [**C7**: Face-to-face, **C8**: Blended, **C9**: Online].

- **Context**: [**C10**: School, **C11**: Higher education].

- **Teachers' status:** [**C12**: Pre-service, **C13**: In-service].

- **Theoretical framework used: [C14**: Theoretical framework].

- **Implications: [C15**: Theoretical implications, **C16**: Practical implications].

- **Types of support provided: [C17**: Collaborative support, **C18**: Material, **C19**: Resources, **C20**: Exemplary materials, **C21**: Tutorial, **C22**: Facilitator, **C23**: Technology, **C24**: Workshops].

- **Design principles**: [**C25**: Design principles].

To highlight gaps in the 21 studies, the following two strategies were used:

1. Visual representations of the themes tackled in the studies for giving the reader a detailed summary of each study compared to other studies.

2. The three gap-spotting strategy proposed by Alvesson and Sandberg (2013) for categorising the types of gaps: 1) confusion spotting (finds contradictions in the literature); 2) neglect spotting (spots areas in the literature that are under-represented); and 3) application spotting (searches for a shortage in the use of a perspective or theory).

Based on the above, Figure 2.1 shows which themes from the 25 were tackled by each study. A green cell means that the theme is tackled, and a white cell means that the theme is not tackled. Figure 2.1 is in the form of a table with the articles' reference numbers shown on the left-hand column (A1 to A21) and a row divided into 25 columns to refer to the themes (C1 to C25). In addition, under the 25 columns, the total number of how many times each theme was tackled in the literature is added. For example, the study with reference number A1 tackled

the following themes: C1, C2, C3, C6, C7, C10, C13, C14, C16, C17, C18, C20, C22, and

C24, but ignored the rest. In addition, in C23, the green column that has: 1) the letter "C"

means that the technology was used for communication; 2) the letter "D" means that

technology was used for design; and 3) the letters "D+C" means that technology was used for

communication and design.

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19	C20	C21	C22	C23	C24	C25
A1																									
A2																									
A3																							C		
A4																							C		
A5																							C		
A6																									
A7																							D+C		
A8																									
A9																							D+C		
A10																							D		
A11																							D+C		
A12																							D+C		
A13																							D+C		
A14																							D+C		
A15																									
A16																									
A17																									
A18																									
A19																									
A20																									
A21																									
Total	21	16	10	9	1	10	12	6	4	18	3	7	16	10	1	16	16	9	1	10	4	19	10	14	0

C1: Design	C2: Develop	C3: Implement	C4: Qualitative	C5: Quantitative
C6: Mixed methods	C7: Face to Face	C8: Blended	C9: Online	C10: School
C11: Higher education	C12: Pre-service	C13: In-service	C14: Theoretical framework	C15: Theoretical implications
C16: Practical implications	C17: Collaborative support	C18: Material support	C19: Resources	C20: Exemplary material
C21: Tutorial	C22: Facilitator	C23: Technology	C24: Workshop	C25: Design principles
C: Communication	D: Design			

Figure 2.1: Themes tackled by each study to identify gaps

From the total number of times each theme was tackled, it can be inferred that there are

certain themes in the learning design literature that were: 1) under-represented (e.g. C5, C8,

C9, C11, C15, C19, C21, and C25); 2) moderately represented (e.g. C3, C4, C6, C12, C14,

C18, C20, and C23); and 3) highly represented (e.g. C1, C2, C7, C10, C13, C16, C17, C22,

and C24).

Figure 2.2 shows the reviewed empirical studies (1 to 21) on the vertical axis and the themes (C1 to C25) on the horizontal axis to show the reader all the gaps in the literature in another visual format that collects all the gaps per theme together. The green column shows how many times the theme was tackled. For example, C25 was not addressed at all, while C14 was addressed 10 times.

C1: Design	C2: Develop	C3: Implement	C4: Qualitative	C5: Quantitative
C6: Mixed methods	C7: Face to Face	C8: Blended	C9: Online	C10: School
C11: Higher education	C12: Pre-service	C13: In-service	C14: Theoretical framework	C15: Theoretical implications
C16: Practical implications	C17: Collaborative support	C18: Material support	C19: Resources	C20: Exemplary material
C21: Tutorial	C22: Facilitator	C23: Technology	C24: Workshop	C25: Design principles
C: Communication	D: Design			

Figure 2.2: Themes tackled by all studies to identify gaps

This figure again shows the themes that were under-represented, moderately represented, and highly represented, but in a different format for a deeper analysis. For example, it highlighted that the two themes C11 and C13 when combined were under-represented.

Figure 2.3 shows the themes with the number of times each was tackled in the literature (refer to Table 2.2) categorised as high, medium, and low. Since there were 21 studies, then the range of numbers from 12 to 21 was considered high, the range from 6 to 11 was considered medium, and the range from 1 to 5 was considered low.

High	Medium	Low
Design (21)	Implementation (10)	Tutorial (4)
Facilitator (19)	Exemplary material (10)	Online (4)
Schools (18)	Technology (10)	Higher education (3)
Development (16)	- Communication (3)	Quantitative methods (1)
Practical implications (16)	- Design only (1)	Resources (1)
Collaborative support (16)	- Both (6)	Theoretical implications (1)
In-service (16)	Material support (9)	Design principles (0)
Workshops (14)	Qualitative methods (9)	
Face to face learning (12)	Theoretical framework TPACK (9)	
	Pre-service (7)	
	Mixed methods (10)	
	Blended learning (6)	

Figure 2.3: Number of times each theme was tackled

This shows that the themes listed in the "High" and the "Medium" columns such as practical implications and theoretical framework (Technological pedagogical and content knowledge (TPACK)) were overlooked, and the ones listed in the "Low" column such as design principles were under-represented.

Figure 2.4 shows the subject fields according to how many times each was tackled in the literature (refer to Table 2.2) categorised as high and low.

High	Low
Science (7)	TEL in general (3)
	Mathematics (3)
	Mobile (2)
	Biology (2)
	German (2)
	French (1)
	Mandarin (1)
	Chemistry and Physics (1)
	Economics (1)
	ICT (1)
	History (1)

Figure 2.4: Number of times each subject field was tackled

This shows that the subject field listed in the "High" column (science) was well represented in the literature and the ones listed in the "Low" column such as German, French, and Mandarin were under-represented.

Figure 2.5 shows the design objectives according to how many times each was tackled in the literature (refer to Table 2.2) categorised as high and low.

High	Low
Lessons (16)	Units (2) Activities (4) Among them are 2 collaborative activities

Figure 2.5: Number of times each design objective was tackled

This shows that the design objective listed in the "High" column (lessons) was well represented in the literature and the ones listed in the "low" column such as activities were under-represented (refer to Table 2.2). It is worth highlighting that the complexity of designing units, lessons, and activities varies in time and effort (see for example Huizinga et al. (2014) who highlighted that designing a series of lessons is a medium to complex design task).

In addition to the above visual analysis, the literature reported certain findings with respect to the support elements (facilitator support, exemplary materials, collaborative support that included exchanging feedback and reflection, and the computer-supported software programs) provided in the PDP. For example, the facilitator support was perceived as being not that helpful in certain instances because of: 1) the quality and amount of input (Nguyen & Bower, 2018); and 2) if not there, problems can occur in the design (Huizinga et al., 2014). However, this support was perceived positively in other instances for reasons related to: 1) supervision during the follow-up phase (Asensio-Pérez et al., 2017); and 2) providing feedback (Jia et al., 2018).

For the exemplary materials, they were perceived as being beneficial in terms of: 1) providing teachers with an operational and complete picture of the design task (Kafyulilo et al., 2015); 2) promoting a better understanding and providing suggestions for how to use TEL in their

teaching practices (Agyei & Voogt, 2012); and 3) understand the integration of technology in their subject (Voogt et al., 2005).

For the feedback and reflection in the collaborative support, they were perceived as being helpful. For example, the feedback was perceived positively by teachers during: 1) the implementation phase from peers and facilitators (Voogt et al., 2005); 2) selecting the appropriate technology (Jia et al., 2018); and 3) exchanging ideas and opinions (Alayyar et al., 2012). The reflection was perceived helpful because it helped teachers to learn from each other and from their practices (Kafyulilo et al., 2016).

For the computer-supported software programs, they were perceived as being useful for: 1) guiding teachers throughout the design of the TEL interventions and reflecting on them (Michos et al., 2018); 2) supporting teachers as designers for sharing and creating learning designs (Asensio-Pérez et al., 2017; Garreta-Domingo et al., 2018); 3) creating learning designs that can be exported to Moodle by teachers (Boloudakis et al., 2018); 4) developing learning activities by teachers (Lewin et al., 2018); 5) supporting teachers as designers (Laurillard et al., 2018); and 6) supporting personalised diagnosis and evaluation of teachers' needs (Ma, Xin, & Du, 2018).

In addition to the above findings, a very few influencers were reported in the literature such as: 1) facilitator support and group collaboration (Nguyen & Bower, 2018); 2) a longer workshop (Asensio-Pérez et al., 2017); and 3) facilitator feedback (Jia et al., 2018). In addition, the few barriers reported in the literature were: 1) lack of time (Voogt et al., 2005); 2) ill-defined shared vision (Huizinga et al., 2014); 3) the large number of technology tools that caused cognitive overload (Nguyen & Bower, 2018); and 4) having ill-structured project

orientation (Jia et al., 2018). Although, the influencers and barriers were very few, they might nevertheless be quite important.

Having presented a high-level and detailed view of what was tackled and reported in the learning design literature, a summary of the gaps that are of interest to this study are highlighted.

Firstly, there were certain aspects that were neglected in the literature that are listed below without any specific order such as:

- The technology tool used for designing, developing, and implementing the lessons, activities, and/or units.
- The design principles used for guiding the development of the exemplary materials.
- The pedagogical outcomes and their relationship to the different types of support provided.
- The pedagogical objectives of the designed lessons, activities, and/or units (e.g. learning elements targeted).
- The tutorials/manuals' format whether they were in the form of a document and/or videos.
- The number and quality of the designed lessons, units, and/or activities produced by teachers after completing the PDP.
- Designing, developing, and implementing lessons, units, and/or activities for AFL.
- The theoretical implications [only 1 of 21 mentioned them, Jimoyiannis (2010)].

- The design principles produced after implementing the PDP. In fact, none of the 21 studies used design-based research as a methodology in the design of the PDP and therefore there were no produced design principles.

Secondly, there were certain aspects that were under-represented such as:

- In-service teachers in higher education (2 of 21) (refer to Figure 2.1).
- Languages in general (4 of 21) and foreign languages and AFL in specific (0 of 21) [refer to Figure 2.4 and Table 2.2].
- Blended learning (6 of 21) (refer to Figure 2.1).
- The use of resources (1 of 21) and tutorials/manuals (4 of 21) (refer to Figure 2.1).
- Implementing the designed material (11 of 21) (refer to Figure 2.1).
- The explicit identification of the influencers and barriers that affected teachers throughout the PDP.

Thirdly, there was one aspect that was over-represented:

- The use of TPACK as a theoretical framework as most studies (9 of 21) that used theoretical frameworks in the 21 studies used TPACK. This suggested that their findings will reflect specific perspectives related to TPACK only and neglect others (refer to Figure 2.1).

Fourthly, there was one aspect that included confusion spotting:

- The facilitator support was found not helpful in a study conducted by Nguyen and Bower (2018) because of the quality and amount of input and in other instances was found helpful due to providing supervision during the follow-up phase (see Asensio-Pérez et al., 2017) and feedback (see Jia et al., 2018).

Fifthly, there was one aspect that included application spotting:

- The literature focused on TPACK (9 of 21 from the reviewed studies) as a theoretical framework. That shows that there is a lack of use of other perspectives and/or theories which might show different findings and different understandings. In addition, as argued by Jimoyiannis (2010), TPACK lacks precision because the connection between its components are not clear.

Having highlighted the gaps in the learning design literature, the next section focuses on the organisational learning literature in order to know more about: 1) the positive influencers and barriers that can affect learning in an organisation and 2) the types of learning outcomes which learners can produce. These two points were not covered appropriately in the learning design literature and that is why the organisational learning literature is consulted here.

2.2- Organisational learning

Organisational learning as a concept first emerged in 1990 in Peter Senge's book 'The Fifth Discipline' (as cited in Lawler & Sillitoe, 2013). Since then, organisational learning has become a very popular concept in different disciplines such as sociology, psychology, management, and business (Knipfer, Kump, Wessel, & Cress, 2013). In addition, the concept has become more recently familiar to universities through the term learning institution (Lawler & Sillitoe, 2013). Espuny and Bertran (2013) referred to organisational learning in universities as a community that has a shared vision in a well-established culture where shared leadership and collaboration are nurtured.

Organisational learning has many benefits and it is receiving a growing interest (Haase, Franco, & Felix, 2015). This kind of learning facilitates the sharing and transfer of knowledge (Haase et al., 2015); promotes innovation (Haase et al., 2015); encourages flexibility and

collaborative learning (Pantouvakis & Bouranta, 2017); creates a climate that promotes learning (Bhaskar & Mishra, 2014); and provides a suitable environment for acquiring new skills for promoting knowledge (Alavi, Abd. Wahab, Muhamad, & Arbab Shirani, 2014).

The next sub-sections focus on: 1) the positive influencers, 2) barriers, 3) and types of learning outcomes highlighted in the organisational learning literature as they were not represented properly in the learning design literature. These details are important because by knowing the positive influencers and barriers, the researcher can take them into consideration while designing and developing the PDP and can relate to in the findings and discussion chapter when answering Sub-RQ3. In addition, by knowing the types of learning outcomes produced in a learning organisation, the researcher can relate to in the findings and discussion chapter when answering Sub-RQ2.

2.2.1- Positive influencers

The literature highlights many positive influencers affecting organisational learning that are listed in the below sub-sections.

2.2.1.1- <u>Culture</u>

Many researchers have highlighted the importance of culture on organisational learning. For example, Bhat, Verma, Rangnekar, and Barua (2012) mentioned the importance of having a supportive and collaborative culture that encourages conversation for facilitating the learning process among the different members of an organisation. Cho, Kim, Park, and Cho (2013) also maximised the importance of culture as a catalyst for organisational learning, when it embraces the value of trust, belonging, family-like relationships, resource acquisition, creativity, flexibility, competition and involvement. Moreover, Pantouvakis and Bouranta (2017) highlighted the importance of having an organisational culture that fosters use of

new technologies, acquisition of information, sharing of information, supporting continuous learning, training, learning as a team, transferring knowledge, and enhancing individuals' skills as a response to environmental changes. Cho et al. (2013) also advocated having a learning environment that encourages learning that values certain features such as open-mindedness and shared vision (Alavi et al., 2014), while Bhaskar and Mishra (2014) recommended having an organisation that supports innovation and experimentation.

2.2.1.2- <u>**Leadership style**</u>

The literature has highlighted that it is essential to use transformational leadership for enhancing learning in an organisation because it focuses on motivation, individual consideration, and intellectual stimulation (Bhat et al., 2012). Waddell and Pio (2014) highlighted that it is important for leaders to: 1) share an agreed-upon valuable vision in an optimistic and enthusiastic environment to act as role models for other members in an organisation; and 2) take members' needs into consideration for promoting learning.

2.2.1.3- <u>**Reflection**</u>

Researchers such as Knipfer et al. (2013), Kyndt, Vermeire, and Cabus (2016), and Walker (2016) have highlighted the importance of reflection for organisation learning. They mentioned that: 1) it acts as a driving force for learning among members in an organisation; 2) it is a cognitive, conscious, and emotional process for sharing experiences and lessons learned; and 3) it encourages meaningful outcomes for achieving innovation and modification (Knipfer et al., 2013).

2.2.1.4- <u>**Emotions**</u>

Researchers such as Grealish, Henderson, Quero, Phillips, and Surawski (2015), Knipfer et al. (2013), and Waddell and Pio (2014) highlighted the importance of emotions and their effect

on organisational learning. For example, Waddell and Pio (2014) referred in their research study to the influence of positive and negative emotions on organisational learning. They mentioned that positive emotions can reinforce the feelings of happiness and confidence in knowledge and skills leading to empowerment, commitment, pride, and energy. However, negative emotions can generate feelings of embarrassment and anger. As a result, these kinds of negative feelings hinder learning. In the same vein, Knipfer et al. (2013) mentioned the term "Psychological safety for learning", as it determines the organisational climate for learning and sharing knowledge where different perspectives are valued.

2.2.1.5- <u>Cooperation</u>

Cooperation was suggested as a condition for learning among members in an organisation for developing better interactional skills, since, through cooperation, people can listen, observe, ask for advice, discuss topics together, and share experiences leading to learning from each other (Kyndt et al., 2016; Schumacher, 2015). Bhaskar and Mishra (2014) also mentioned that individuals in cooperative learning environments learn from each other as they share different perspectives together.

2.2.1.6- <u>Feedback</u>

Feedback was perceived to be important for organisational learning (Knipfer et al., 2013; Kyndt et al., 2016) as it has two functions: 1) cognitive; and 2) motivational. Firstly cognitive, because it provides information about the adequacy of one's knowledge; and secondly motivational, because it shows whether expectations are met or not. Bhaskar and Mishra (2014) also advocated constructive feedback as a catalyst for motivating the process of organisational learning.

2.2.1.7- <u>Accessing and sharing information</u>

Accessing and sharing information were found to be effective for organisational learning because they: 1) provide the opportunity to acquire knowledge and information (Kyndt et al., 2016); 2) motivate the learning process leading to better organisational performance (Seo, Lee, & Moon, 2015); and 3) facilitate the retaining and reuse of knowledge within an organisation (Tam & Gray, 2016).

2.2.1.8- <u>Coaching</u>

Coaching was found essential for enhancing organisational learning (Kyndt et al., 2016) because the coach: 1) guides people by sharing his/her experience in addition to providing support for empowering individuals (Grealish et al., 2015); and 2) acts as a support tool for enhancing organisational learning (Bhaskar & Mishra, 2014).

2.2.1.9- <u>Technology</u>

Technology has been perceived as a tool for facilitating communication and sharing of information, exchanging feedback, and monitoring using different commercial software applications such as Blackboard (Za, Spagnoletti, & North-Samardzic, 2014).

2.2.1.10- <u>Personal characteristics</u>

Researchers have highlighted the importance of having certain personal characteristics for enhancing organisational learning such as: 1) learning motivation, self-efficacy, and proactivity (Kyndt et al., 2016); 2) commitment to learning as an organisational value (Cho et al., 2013); 3) vigour, dedication, and absorption (Bhaskar & Mishra, 2014); and 4) individual motivation (Tam & Gray, 2016). In addition, Pantouvakis and Bouranta (2017) highlighted that peoples' thoughts and behaviours affect the capability of an organisation to learn.

Having highlighted the positive influencers that affect learners positively in an organisation, the next sub-section highlights the barriers.

2.2.2- Barriers of organisational learning

The literature has highlighted some barriers that hinder organisational learning, including: 1) lack of flexibility as this hampers the flow of knowledge (Walker, 2016); 2) internal personal competition and the avoidance of sharing information (Klein, 2016); 3) limited interaction and absence of shared vision (Alavi et al., 2014); 4) lack of direction (Cho et al., 2013); 5) individual differences with respect to beliefs, values, and expectations (Bensimon, 2005); and 6) limitation of time and resources (Chien, Lin, & Lien, 2015).

Having highlighted the barriers that affect learners negatively in an organisation, the next sub-section highlights the learning outcomes produced in an organisation.

2.2.3- Learning outcomes

Learning outcomes have been perceived in different ways in the literature. For example, Kyndt et al. (2016) referred to learning outcomes as changes in knowledge, attitudes, or skills as a response for engagement in different learning processes leading to change in individuals' professional achievement. In addition, other researchers said there are a range of kinds of learning outcomes: 1) gaining knowledge (Alegre, Pla-Barber, Chiva, & Villar, 2012); 2) taking action (Cho et al., 2013); or 3) applying and sharing knowledge (Walker, 2016). However, it is worth mentioning that as Kyndt et al. (2016) highlighted, insights about which learning conditions lead to which learning outcomes is missing from the literature.

The question that arises now is: What is the impact of the reviewed literature on designing, developing, and implementing the PDP? The answer to this question is in the next section.

2.3- Impact of the reviewed literature on the design of the PDP

The reviewed literature informed the design elements for this research study in the following ways:

1. Considering teachers' needs prior to developing the PDP (Brennan, 2015).

2. Providing teachers with: 1) different types of support; 2) feedback; 3) outcomes of intrinsic value; 4) meaningful content; and 5) opportunity to practice what was learned in authentic contexts (Kali et al., 2015; Uluyol & Sahin, 2016).

3. Gaining a number of forms of support from the facilitator: online (Alayyar et al., 2012); and just-in-time support (Kafyulilo et al., 2015).

4. Using positive influencers in facilitator support, such as: 1) transformational leadership (Bhat et al., 2012); 2) coaching (Bhaskar & Mishra, 2014); 3) feedback (Kyndt et al., 2016); and 4) collaborative culture (Bhat et al., 2012).

5. Including a number of activities in collaborative learning support: 1) accessing and sharing information (Seo et al., 2015); 2) exchanging feedback (Kyndt et al., 2016); and 3) reflection (Walker, 2016).

6. Including exemplary materials (Svihla et al., 2015) as a type of support.

7. Being aware of the positive influencers and barriers that affect learning in an organisation and so provide participants with: 1) enough time to practice; 2) resources to support them in the design, development, and implementation of the TEL activities; 3) direction; and 4) shared vision in an interactive environment (see Alavi et al., 2014; Chien et al., 2015; Cho et al., 2013).

8. Choosing a technology tool (e.g. Blackboard) for 1) sharing of information; 2) monitoring and exchanging feedback; and 3) connecting individuals with learning objects and peers (Za et al., 2014). However, as a note specifically relating to this

research, the scope did not focus on software design programs that support teachers in their designs as they might be a burden on the teachers (Asensio-Pérez et al., 2017).

9. Being aware of learning outcomes that could be achieved after implementing the PDP such as: 1) gaining knowledge (Alegre et al., 2012); 2) taking action (Cho et al., 2013); 3) applying and sharing knowledge (Walker, 2016); and 4) a focus on involving a learning organisation (Bhat et al., 2012; Pantouvakis & Bouranta, 2017).

10. Being aware of personal characteristics and emotions (positive/negative) which participants might experience during the implementation of the PDP (see Grealish et al., 2015).

11. Using blended learning for delivering the PDP, as undertaken by Svihla et al. (2015).

12. Assigning the role of the facilitator to the researcher as was done in another study conducted by Agyei and Voogt (2012). As a result, the researcher will be referred to as the researcher/facilitator from chapter 4 to chapter 8.

13. A focus on one tool for designing and developing the activities as too many tools can be a burden on teachers, leading them to being overwhelmed (Nguyen & Bower, 2018).

2.4- Summary

In this chapter, the focus on the literature has related to: 1) teachers' learning design needs and support; 2) organisational learning; and 3) the impact of the reviewed literature on the design, development, and implementation of the PDP. In the next chapter, the focus is on the theoretical framework, used in designing the PDP, and accommodating the many needs identified in the literature review.

Chapter 3: Theoretical framework

The aim of this DBR study was to support teachers in designing, developing, and implementing TEL activities for teaching AFL through a PDP. It is important for the PDP to be based on a theoretical framework that guides this design (Laurillard et al., 2011; Wenger, 1998).

The main framework used for designing the key pillars of the PDP was Laurillard's conversational framework (2002, as cited in Laurillard, 2012). In addition, Passey's (2011) learning elements framework was used to complement part of the Laurillard framework as the researcher found the conversational framework insufficient to inform the design of that PDP. The connection between the two frameworks is discussed later in section 3.2, after highlighting the main elements of the conversational framework; that is, showing the reader where the gap was that needed to be informed by Passey's (2011) learning elements framework and accordingly helping in the design, development, and implementation of the PDP.

It is worth highlighting that the two frameworks together were found particularly pertinent, because they accommodated many of the needs identified in the literature review.

3.1-   Firstly: Laurillard's conversational framework

The conversational framework was developed by Laurillard (2002, as cited in Laurillard, 2012) and inspired by Gordon Pask's Conversation Theory (Laurillard, 2012) for enabling and motivating learners to continually generate actions and modulate practices.

To achieve that, Laurillard's framework uses iterative formal learning that links both knowledge and skills in an engaging environment where the learner interacts with both the teacher and his/her peers. In addition, it focuses on the role played by both the teacher and the

learner through different types of learning such as conceptual learning, experiential learning, social constructivism, constructionism, and collaborative learning (Laurillard, 2012).

Different learning modes are included in this framework: 1) acquisition; 2) inquiry; 3) practice; 4) production; 5) discussion; and 6) collaboration. Laurillard (2012) defined each of these as follows:

1. In learning through acquisition, the learner watches, reads, or hears an explanation of the teacher's concept in addition to the teacher's model actions. Through this type of learning, the learner is enabled to see a demonstration of the teacher's practice and can modulate their own concept but does not require them to generate any actions.

2. In learning through inquiry, the learner explores the learning resources that include the concept being taught. Therefore, the learner in this type of learning is more in control because s/he learns through finding out more about the concept.

3. In learning through practice, the learner generates actions using their developed concepts to put theory into practice. Teachers' model actions are used as a reference by the learner to provide intrinsic feedback and therefore provide their actions.

4. In learning through production, the learner produces an output which is considered a representation of their learning.

5. In learning through discussion, which is a type of social learning, the learners discuss ideas and questions raised by the teacher. This process leads learners to modulate their ideas and generate more questions and ideas.

6. In learning through collaboration, learners share their produced actions together and that paves the way for them to open discussions and modulate their actions. The learner engages with at least one peer. Therefore, collaboration incorporates learning through practice, production, and discussion.

According to Laurillard (2012), the above learning types can occur through five cycles (see Figure 3.1): 1) teacher communication cycle (TCC); 2) teacher practice cycle (TPC); 3) teacher modelling cycle (TMC); 4) peer communication cycle (PCC); and 5) peer modelling cycle (PMC).
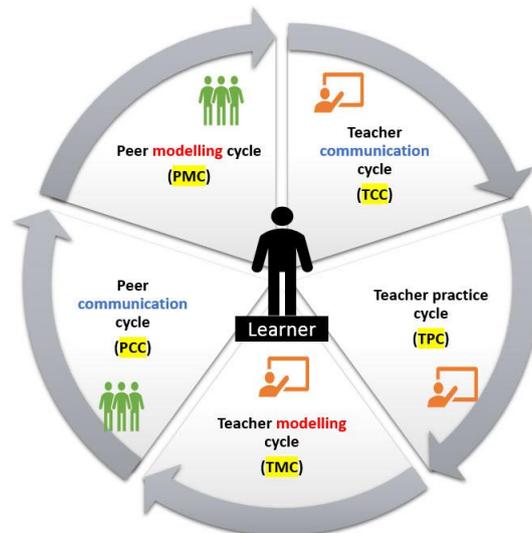
Figure 3.1: Laurillard's (2002) conversational framework

Firstly, in the TCC, the teacher: 1) explains the concept; 2) elicits learners' questions; and 3) responds to learners' questions. The teacher in this cycle uses any kind of representation of the concept to help learners in the learning process.

Therefore, the main aims of this cycle are to:

- o Enable learners to modulate their conception by giving them access to teachers' concepts.
- o Motivate learners to generate questions and receive extrinsic feedback from their teachers.

Secondly, in the TPC, the teacher provides a practice environment for the learner where s/he can generate actions and receive feedback from the teacher. In this cycle, the teacher designs

tasks that suit the learner's level of knowledge and creates tasks that motivate learners to reveal their thinking through external representations.

Therefore, the main aims of this cycle are to:

- o Enable learners to modulate their concepts.
- o Motivate learners to generate actions for eliciting extrinsic feedback.

Thirdly, in the TMC, the teacher provides a model for a task where the learner can refer to correct his/her practice. Learners can receive intrinsic feedback, since the model will inform them about how to adjust their actions in comparison to the model. The aim is to motivate the learner to work independently by revising his/her actions in comparison to the modelling environment to achieve the task goal.

Therefore, the main aims of this cycle are to:

- o Enable learners to modulate their concepts and practices.
- o Motivate learners to generate an action that elicits intrinsic feedback.

Fourthly, in the PCC, the teacher encourages learners to produce and share their outputs with other peers in a collaborative learning environment where they can learn from each other and receive feedback on the produced outputs. To facilitate this process, the teacher provides learners with means to communicate together.

Therefore, the main aims of this cycle are to:

- o Enable learners to modulate their concepts.
- o Motivate learners to generate a comment for eliciting comments from other peers.

Fifthly, in the PMC, the teacher motivates the learners to share their outputs with other peers as that enables them to modulate their outputs by using peers' outputs as a model for reference. To facilitate this process, the teacher provides learners with means to share their produced outputs together.

Therefore, the main aims of this cycle are to:

- o Enable learners to modulate their concepts and practices.
- o Motivate learners to generate outputs to be shared for negotiation.

According to Laurillard (2012), at least two cycles are needed to assure the teacher that the learner is learning.

3.2-   Secondly: Passey's learning elements framework

Having highlighted the five cycles of Laurillard's (2002) conversational framework, this section shows how Passey's (2011) learning elements framework was needed in order to close a gap in this framework.

In the TMC cycle of Laurillard's (2002) conversational framework, there was a need for another framework that guided the design of the models, because the Laurillard framework did not provide the researcher with any design principles for designing the exemplary material. For that purpose, Passey's (2011) learning elements framework was consulted (see Figure 3.2 for visualising how the two frameworks were used together).
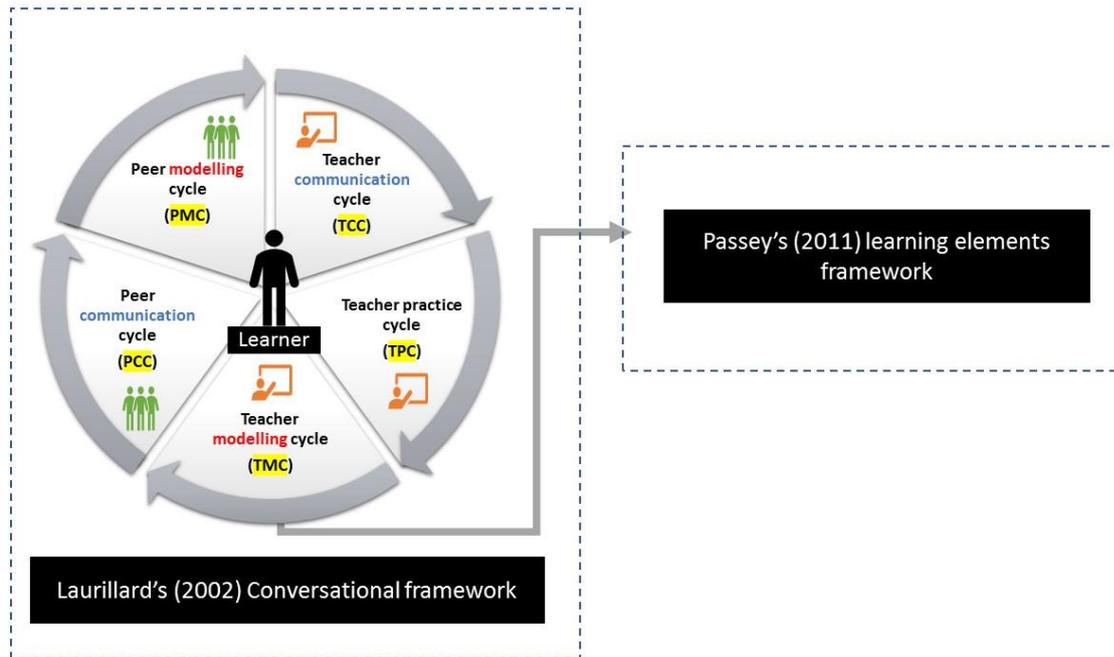
Figure 3.2: The relation between the two frameworks

Passey's framework consists of five main learning elements: 1) megacognitive; 2) cognitive; 3) metacognitive; 4) social; and 5) societal. Megacognitive focuses on wider and deeper learning as it focuses on transferring learning across subjects in addition to providing different types of applications in real-life situations (Passey, 2014). Cognitive learning focuses on internalisation, internal cognitive processing, and externalisation of knowledge. Metacognitive learning focuses on ways learners learn and how information is transferred from one situation to another. Social learning focuses on ways learners interact with others (McCormick, 1999, as cited in Passey, 2014). Societal learning focuses on real-life situations (McFarlane, 1997, as cited in Passey, 2014).

From the entire framework, the researcher focused only on cognitive learning for guiding the design elements of the models (exemplary materials) in the TMC. Cognitive learning according to Passey's (2011) learning elements framework focuses on: 1) internalisation; 2) internal cognitive processing; and 3) externalisation. In this study, the internalisation and the externalisation learning elements were used for guiding the design elements of the exemplary

materials and were also used in the data analysis. The internal cognitive processing learning element was used only in the data analysis.

In terms of internalisation, it focuses on different forms of external stimuli that engage learners in the learning process and their effect on the internal mind. Internalisation according to Child (1973) (as cited in Passey, 2014) includes the learning elements presented in Table 3.1.

Table 3.1: Internalisation

Learning element	Focus
Attention	This element focuses on being attentive to the activity.
Sensory stimuli	This element focuses on the forms of knowledge and ideas accessed through one or more senses. Gardner (1991) (as cited in Passey, 2014) identified nine types of sensory stimuli as follows: • **Visual**: Knowledge is presented in different visual forms such as pictures, videos, and/or real situations. • **Auditory**: Knowledge is presented through audio files, teachers' talk, and/or videos. • **Kinaesthetic**: Knowledge is presented in the form of material and/or resources handled through motor skills such as using the keyboard or mouse. • **Emotional**: Emotional links such as joy, empathy, sympathy, and/or sadness are recognised by the learner when ideas are presented. • **Social**: Knowledge is described through discussing and/or questioning concepts with peers, teacher, and/or others. • **Textual**: Knowledge and ideas are presented in text form. • **Musical**: Material is presented in a musical form. • **Interpersonal**: Knowledge and ideas are acquired through interaction with peers, teacher, and/or other. • **Intrapersonal**: Knowledge is acquired through questioning oneself where external stimuli affect the learner to ask questions internally.
Acquisition	This element focuses on recognising knowledge after being accepted into the mind to be handled further through internal cognitive processes.

In terms of internal cognitive processing, this element is concerned with the different ways of handling information internally through manipulating knowledge and relating it to already

existing knowledge and ideas, to integrate that knowledge to a wider learning canvas. Internal cognitive processing has been described differently by many researchers. Firstly, Child (1973) (as cited in Passey, 2014) described subject knowledge processes through searching, summarising, generating or developing ideas, hypothesising, imagining, gaining skills, and gaining understanding. Bloom (1956) (as cited in Passey, 2014) focused on handling knowledge through acquisition, comprehension, application, analysis, synthesis, and evaluation, while Moseley et al. (2005) (as cited in Passey, 2014) focused on thinking skills such as creativity, enquiring, questioning, conceptualising, comparing, reasoning, and interpreting. Additionally, Child (1973) (as cited in Passey, 2014) focused on elements related to memorisation such as rehearsal, retention, and recall. Details regarding each learning element within the arena of internal cognitive processing are given in Table 3.2.

Table 3.2: Internal cognitive processing

Learning element	Focus
Subject knowledge	To cognitively process subject knowledge internally, learning can occur through: • **Searching:** The learner seeks information in large data sets or in one or more sources. • **Summarising**: The learner selects key points to add to a current knowledge. • **Generating or developing ideas**: The learner takes existing knowledge to generate other ideas. • **Hypothesising**: The learner takes knowledge and forms questions that need to be validated through additional knowledge. • **Imagining**: The learner takes existing knowledge that leads to questions such as 'What if?' • **Gaining skills**: The learner gains certain skills due to accessing certain knowledge. • **Gaining understanding**: The learner gains understanding of both the content and context as a result of accessing certain knowledge.
Bloom's work	To cognitively handle and manipulate learning internally, learning can occur through: • **Acquisition**: The learner recognises knowledge gained in addition to existing knowledge.

Learning element	Focus
Bloom's work	**Comprehension**: The learner understands knowledge at a descriptive level. **Application**: The learner uses knowledge in another setting other than the original setting. **Analysis**: The learner questions knowledge and draws other ideas through different ways, such as comparing, contrasting, categorising, and/or arguing points that arise from other material. **Synthesis**: The learner brings knowledge and ideas together to build a wider picture leading to deeper understanding. **Evaluation**: The learner questions knowledge to see how it can be used in certain situations and therefore judges its use and value.
Thinking skills	To cognitively process learning internally, thinking skills can be approached through: **Creativity**: The learner takes existing knowledge and creates new knowledge with unique qualities beyond the original. **Enquiring**: The learner looks at certain areas of interest to collect more details and/or ideas. **Questioning**: The learner questions ideas critically rather than accepting them as is. **Conceptualising**: The learner develops a concept by shaping ideas and/or reconstructing ideas to develop or amend previously-held concepts. **Comparing**: The learner searches for similarities and differences in existing knowledge and compares them. **Reasoning**: The learner compares knowledge to reason with them and then draw conclusions or hypothesis. **Interpreting**: The learner takes knowledge and works with it to draw other conclusions leading to better understanding.
Memorisation	**Rehearsal**: The learner considers existing knowledge by recognising additions or differences that can be of interest. Knowledge and ideas can be accessible from long-term or short-term memory. **Retention**: The learner retains knowledge and ideas through relating them to various sensory associations such as visual, textual, auditory, social, and/or emotional. **Recall**: The learner recalls knowledge from memory through associations from mental schemas.

In terms of externalisation, this element focuses on the different ways for demonstrating

understanding to others (see Table 3.3).

Table 3.3: Externalisation

Learning element	Focus
Writing	The learner reflects knowledge in textual form.
Reporting	The learner reflects knowledge in a defined structured report form.
Speaking	The learner reflects knowledge through one-to-one discussions or through responding to questions.
Presenting	The learner reflects knowledge through presenting material to wider audiences.
Drawing	The learner reflects knowledge through structured or unstructured drawings.
Completing	The learner reflects knowledge through filling in gaps either by including words or choosing words from options.
Moving	The learner reflects knowledge through using motor skills to move items.

Having provided a description of the two theoretical frameworks and the connection between them, the next section focuses on linking them with the literature review.

3.3-   The link between the two theoretical frameworks and the literature review

This section shows how the theoretical frameworks relate to the literature review. Firstly, in the TCC, the teacher: 1) explains the concept; 2) elicits and responds to learners' questions; and 3) uses any kind of representation to facilitate the learning process (Laurillard, 2002). Linking this with the literature, this can be done through different types of support factors such as dialogue (Svihla et al., 2015), availability of facilitator support (Kafyulilo et al., 2015), sharing the same vision (Espuny & Bertran, 2013), face-to-face support (Agyei & Voogt, 2012), online learning material (Kafyulilo et al., 2015), online support (Alayyar et al., 2012), scaffolding the learning process (Svihla et al., 2015), and extended time for practice (Brennan, 2015).

Secondly, in the TPC, the teacher: 1) provides a practice environment for the learner for generating actions and receiving feedback; 2) designs tasks that suit the learner's level of knowledge; and 3) creates tasks that motivate students to reveal their thinking through

external representations (Laurillard, 2002). Linking this with the literature, this can be done through different types of support factors such as those already listed in the TCC cycle, in addition to: providing feedback (Uluyol & Sahin, 2016); meeting learners' contextual needs (McKenney & Mor, 2015); providing just-in-time support (Kafyulilo et al., 2015); engaging learners in the design (Kali et al., 2015); observing the benefits of using technology and providing outcomes of intrinsic value (Uluyol & Sahin, 2016); encouraging feelings of inclusion and ownership for motivating learners (Kali et al., 2015); and having autonomy over learning (Sadaf et al., 2016).

Thirdly, in the TMC (informed by Passey's (2011) learning elements framework for designing the models), the teacher: 1) provides a model for a task for correcting practice; and 2) provides the learner with an environment for working independently (Laurillard, 2002). Linking this with the literature, this can be done through different types of support factors such as providing exemplary materials (Voogt et al. 2005); designing for authentic use (Kali, et al., 2015); and using online learning material (Kafyulilo et al., 2015).

Fourthly, in the PCC, the teacher: 1) encourages learners to produce and share their outputs with other peers; and 2) provides them with means to communicate together in a collaborative medium. Linking this with the literature, this can be done through different types of support factors such as reflection (Walker, 2016), sharing (Knipfer et al., 2013), cooperation (Schumacher, 2015), providing collaborative teams (Kali et al., 2015), transferring knowledge (Bhaskar & Mishra, 2014), and accessing information (Kyndt et al., 2016).

Fifthly, in the PMC, the teacher: 1) motivates the learners to share their outputs with their peers; and 2) provides them with means to share their produced outputs. Linking this with the

literature, this can be done through the same types of support factors previously mentioned in the PCC.

3.4- Summary

In this chapter, the focus has been on the theoretical frameworks that informed the design of the PDP, as well as the relationship between them. In addition, the link between the theoretical frameworks and the literature review was highlighted. The next chapter focuses on the development and implementation of the PDP, providing details with a thick description of the setting.

Chapter 4: The PDP

This DBR study focuses on researching the design, development, and implementation of a PDP. The aim of this PDP was to enable teachers to design, develop, and implement TEL activities for teaching AFL. In this study, the definitions of the three terms are:

1- **Designing the TEL activities**: The teacher thinks about: 1) the objective of the activity; 2) her role and students' roles; 3) the features she will use from the technology tool to address design needs; 4) the instruction of the activity; and 5) whether the activity will be done inside or outside the classroom.

2- **Developing the TEL activities**: The teacher develops the activities using the design she thought of.

3- **Implementing the TEL activities**: The teacher applies the TEL activity with her students either inside or outside the classroom.

In the previous chapter, the researcher focused on the theoretical frameworks that are used in the design of the PDP and their link with the literature review. To complement the previous chapter, this chapter focuses on the development and implementation of the PDP.

4.1- The development of the PDP

For a detailed and thick description of the PDP, the following elements are included: 1) mode of delivery; 2) duration; 3) location; 4) content; 5) technology tool; 6) exemplary materials; 7) resources; 8) medium of delivery; 9) PDP tasks; 10) coaching and leadership style; and 11) types of support.

4.1.1- Mode of delivery

It is important, because of the nature of the target context, to design the PDP in a flexible manner to enable teachers to learn wherever and whenever possible (refer to sections 1.1 and 1.2 that highlighted the nature of the target context where teachers are allocated in two campuses that are 38 kilometres apart, in addition to having different teaching schedules making it impossible to meet at the same time for delivering the PDP, so finding a flexible mode of delivery was important). Therefore, the researcher/facilitator used a blended learning delivery mode where a mix of both online and face-to-face support might be appropriate. Accordingly, the programme was delivered using a blended learning flex model. Horn and Staker (2015) suggested this model so that learners could learn mainly online and come to meet with the teacher face-to-face whenever needed. This model was chosen to give teachers the ability to access all the programme resources online, to work independently and arrange fixed times to meet face-to-face weekly with the researcher/facilitator.

4.1.2- Duration

When undertaking a study, Johnson and Christensen (2014) advised extending the amount of time in fieldwork to study the participants better and see the effect of the intervention. Accordingly, the researcher/facilitator conducted the study over an entire semester, equivalent to 8 weeks. In addition, participants' preferred times were taken into consideration by the researcher/facilitator, before designing the intervention. For example, the researcher/facilitator met: one teacher on Sunday at 2:00pm; three teachers on Monday at 12:30pm, 1:30pm, and 2:30pm; three teachers on Tuesday at 8:00am, 9:00 am, and 1:00pm; three teachers on Wednesday at 11:30am, 2:00pm, and 3:30pm; and one teacher on Thursday at 1:30pm.

4.1.3- Location

The PDP was implemented on the two campuses of the university. The researcher/facilitator met each teacher alone in her own office, where there was an effective working computer with a high-speed internet connection. The atmosphere in the office was calm and there was no disturbance of any kind.

4.1.4- Content

The researcher/facilitator chose to train teachers on the design, development, and implementation of computer supported collaborative learning (CSCL) activities. This type of TEL activity enables learners to share and build knowledge in a collaborative environment using digital technology tools such as Web 2.0 (Jones, 2015). It also has many benefits such as facilitating collaborative knowledge building (Parchoma, 2014), solving problems in a collaborative environment (Zenios, 2011), and sharing knowledge through discussions and reflections (Hartley, 2010).

4.1.5- Technology tool

The researcher/facilitator chose "Google Slides" as a Web 2.0 tool to help teachers design, develop, and implement CSCL activities as it has many features that allow for:

- Typing in Arabic; setting text direction; adjusting text alignment; changing font size; changing font colour; uploading videos; inserting videos from YouTube and/or Google Drive; inserting images and adjusting the size; inserting shapes, diagrams, charts, hyperlinks, callouts, arrows, and equations; creating tables; inserting text boxes and adding coloured borders; and moving objects freely in the page.

- Sharing slides with others through the "Share" button by adding their emails.

- Creating multiple pages (slides) that can be automatically saved and published online for others to view.

- Enabling teachers to: 1) share the CSCL activities with students so that they can work together and see the work of each other instantly; 2) give feedback to students either synchronously or asynchronously; and 3) have access to students' work anytime anywhere.

- Enabling students to: 1) have access to their work and colleagues' work anytime anywhere; and 2) work with their colleagues and receive feedback from each other.

- Using it easily because it looks like Microsoft (MS) PowerPoint (a main reason for choosing Google Slides since the aim was to enable and motivate teachers to design, develop, and implement TEL activities for teaching AFL, so choosing a tool that met their needs and level of knowledge was important).

- Designing the page (slide), the way they wanted to meet their design needs, as the slide looks like a white webpage.

4.1.6- Exemplary materials

Having highlighted the technological features of Google Slides, it is important to shed light on features that are defined by the term "technology affordances". Technological affordances were defined by Järvelä et al. (2015) as the properties of an object that affect how they can be used. In line with this definition, Google Slides with all the features mentioned above in sub-section 4.1.5 (technology tool) can afford teachers with uses that can be applied to elements of cognitive learning that are mentioned in Passey's (2011) learning elements framework (e.g. internalisation, internal cognitive processing, and externalisation) for the design, development, and implementation of the CSCL activities.

In the exemplary materials, the researcher/facilitator focused on cognitive learning elements, especially the ones related to internalisation and externalisation, because: 1) internalisation directs teachers to use the Google Slides' features to design the layout of the CSCL activities that can include text, shapes, links, images, videos, and/or sound files; and 2) externalisation directs teachers to think of which form of production (e.g. typing, speaking, presenting, moving, drawing, and/or completing) they want students to use to reflect on their own learning. For internal cognitive processing, it was felt that this did not need specific guidance from the researcher/facilitator, because all teachers had many years of experience that could enable them to consider this learning element easily.

Based on that, teachers were provided with 22 exemplary materials in a video-recorded format. All were authentic CSCL activities that were implemented in the researcher/facilitator's real AFL classes. In these video manuals, the researcher/facilitator included: 1) the objective behind each activity; 2) how students reacted to each activity; and 3) students' produced outcomes on each activity.

In addition, the researcher/facilitator showed teachers not only how to use the cognitive learning elements through Google Slides, but also how to create a space for each student to add his/her answer, highlighted by adding the student name on the assigned space inside the slide. Through adding students' names in each slide, students were able to know where they were supposed to contribute in the CSCL activity and the teacher was able to evaluate each student individually by his/her name.

4.1.7- Resources

All resources provided to teachers are shown in Table 4.1.

Table 4.1: Resources

Resource type	Number of files	Objective
Video manuals	16	How to use the different features of Google Slides such as how to insert text, videos, audio files, shapes, links, tables, charts and images. How to crop images, share Google Slides, publish Google Slides, customise shapes, insert diagrams, create a space for each student to insert his/her answer, link videos to YouTube, and colour shapes. The duration of the videos ranged from 51 seconds minimum to 10 minutes and 16 seconds maximum.
Video manual	1	How to video record the CSCL activities to share them with their colleagues online. The tool they were trained on is called 'Screencast-O-Matic'.
Document manuals in the form of MS PowerPoint presentations	2	Stating the main objective of the PDP and what was expected from them, with another one explaining Passey's (2011) learning elements framework to use as reference during the design of their CSCL activities.
Pictures uploaded on Google Drive categorised by themes	913	To help teachers by incorporating them in the TEL activities.

4.1.8- Medium of delivery

As discussed in the literature review chapter, technology can have many benefits in organisational learning. It facilitates communication and sharing of information since it enables flexible and distributed learning through commercial software applications such as Blackboard (Za et al., 2014). In addition, it facilitates the process of monitoring individuals and connecting them with learning objects and peers (Za et al., 2014). Having said that, the researcher/facilitator used Blackboard as a computer supported tool in this PDP.

Through Blackboard, the researcher/facilitator: 1) created spaces in the form of folders that included the resources (video and document manuals, exemplary materials, and templates); and 2) created two folders for each participant with each one's name (one for uploading the designed activities and another for receiving feedback/comments from their colleagues).

4.1.9- PDP tasks

The process of the PDP started with supporting teachers to enable them to design, develop, and implement CSCL activities and ended sequentially with teachers: 1) reflecting on their own CSCL activities through sharing them with their colleagues; 2) giving feedback to their colleagues' CSCL activities; and 3) receiving feedback on their CSCL activities from other colleagues (refer to Figure 4.1 for an illustration of these tasks).
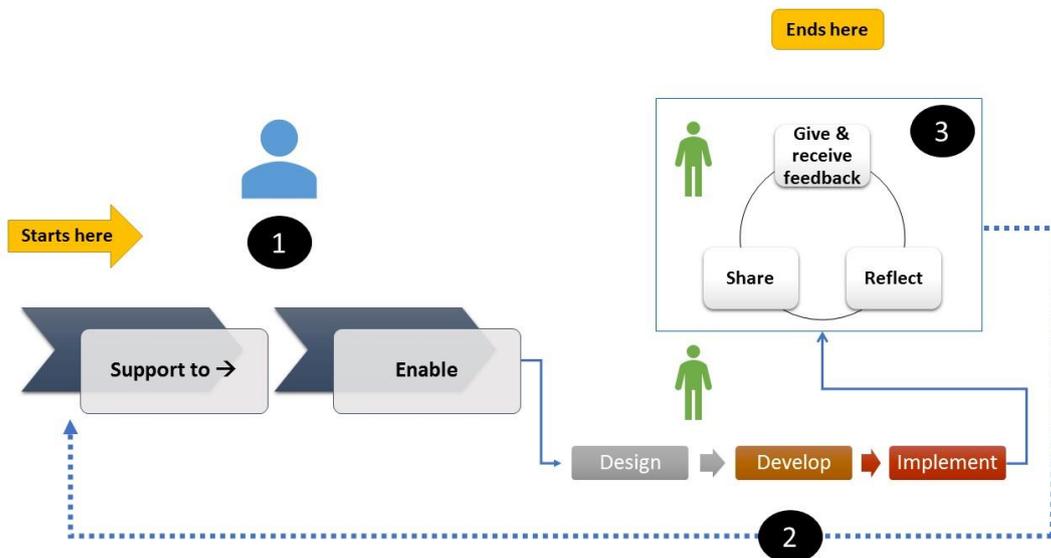
Figure 4.1: Tasks

In the two cycles of the PDP, teachers were asked to accomplish the following tasks: 1) design, develop, and implement at least two CSCL activities; 2) upload their CSCL activities on Blackboard in a video-recorded format to share with their colleagues on Blackboard; 3) give feedback to at least two colleagues on their CSCL activities in each cycle and give priority to the ones who did not receive any feedback; 4) access the exemplary materials

whenever needed to gain more ideas; and 5) access the video manuals to know how to use Google Slides.

4.1.10- Coaching and the leadership style

The main role of the researcher/facilitator was to coach teachers through an intentional formal learning and this was done through weekly structured hourly meetings with each teacher throughout the entire semester to make sure that the PDP tasks were accomplished. In these meetings, the researcher/facilitator's role was to: 1) communicate with teachers; 2) give teachers time to practice under her supervision; 3) follow up to make sure that the PDP tasks were accomplished by each teacher; 4) collect teachers' needs; and 5) give feedback on their practice and respond to questions. As previously highlighted in the literature review chapter, coaching is essential for enhancing organisational learning (Kyndt et al., 2016) because the coach actively guides people by sharing his/her experience as that provides support for empowering individuals (Grealish et al., 2015) and acts as a supporting tool for enhancing organisational learning (Bhaskar & Mishra, 2014).

In addition, teachers were given the opportunity for informal flexible learning. That kind of learning focuses on the learner as s/he is responsible for his/her own learning by collaborating with colleagues to share experiences and exchange knowledge. In addition, they had the opportunity to contact the researcher/facilitator anytime through emails or mobile telephones to ask questions and/or share experiences whenever needed.

The researcher/facilitator also provided teachers with punctual constructive feedback whenever needed, as this was an important condition that leads to organisational learning (Knipfer et al., 2013; Kyndt et al., 2016). Feedback provides information about the adequacy of one's knowledge and it shows individuals whether they meet the expectations or not. This

kind of feedback is a catalyst for motivating the process of organisational learning as previously highlighted by Bhaskar and Mishra (2014).

In terms of leadership style, the researcher/facilitator used a transformational leadership style for enhancing teachers' learning (Bhat et al., 2012). A transformational leadership style was used for motivating teachers by sharing an agreed-upon vision and by acting as a model for them as a teacher teaching AFL using the same technology tool they were trained on (Google Slides). In addition, their needs were taken into consideration before, during, and after developing the PDP. This kind of leadership is recognised as being helpful in promoting learning as previously stated by Waddell and Pio (2014).

4.1.11- Types of support

From the reviewed literature, different types of support were recommended. Huizinga et al. (2014) mentioned that effectiveness arising from selecting only one way to support teachers in the design process is still unclear. Accordingly, the researcher/facilitator used different types of support in the design of the PDP to support teachers.

In the conversational framework phases (TCC, TPC, TMC, PCC, and PMC), the following types of support were provided:

In the TCC, the researcher/facilitator: 1) explained the concept of the CSCL through a MS PowerPoint presentation; 2) elicited and responded to teachers' questions to make sure that they could undertake the tasks assigned to them throughout the PDP; 3) used different kinds of representations (refer to the resources in sub-section 4.1.7) to facilitate the learning process; 4) was available in the one-to-one face-to-face sessions and at any other times as needed; 5) shared with them the objective of the PDP on Blackboard; 6) scaffolded the learning process step-by-step through having a certain goal to accomplish in each face-to-face

session; and 7) extended time for practice so that each cycle of the PDP was distributed across 4 weeks.

In the TPC, the researcher/facilitator: 1) provided teachers with a practice environment for generating actions and receiving feedback in the face-to-face sessions; 2) designed tasks that suited teachers' levels of knowledge; 3) created tasks that motivated teachers to reveal their thinking through external representations; 4) provided teachers with feedback anytime whenever needed; 5) met teachers' contextual needs by asking them certain questions related to the language skill they teach, the book and/or material they use, students' proficiency levels, the course outline, course objectives, and expected outcomes; 6) provided them with just-in-time support whenever needed; 7) linked Google Slides as a technology tool to instructional practices, by providing authentic exemplary materials; 8) asked them to observe the benefits of using Google Slides by observing the produced outcomes of the researcher/facilitator's students; and 9) gave them autonomy over learning.

In the TMC, the researcher/facilitator provided exemplary materials that were in the form of: 1) video manuals that showed them step-by-step instructions of how to accomplish certain tasks to enable them to amend their practice independently; and 2) authentic examples of CSCL activities implemented in class with students' outcomes.

In the PCC, the researcher/facilitator: 1) encouraged teachers to produce and share their outputs (CSCL activities) with other peers; 2) provided them with means to communicate together in a collaborative medium through Blackboard; 3) encouraged them to reflect on their activities using video-recording software; and 4) encouraged them to share their CSCL activities with their colleagues through Blackboard.

In the PMC, the researcher/facilitator encouraged teachers to use each other's produced outcomes as a model (exemplary materials) with other colleagues.

4.2- The implementation of the PDP

A detailed illustration of how the PDP was implemented is highlighted in Figure 4.2.
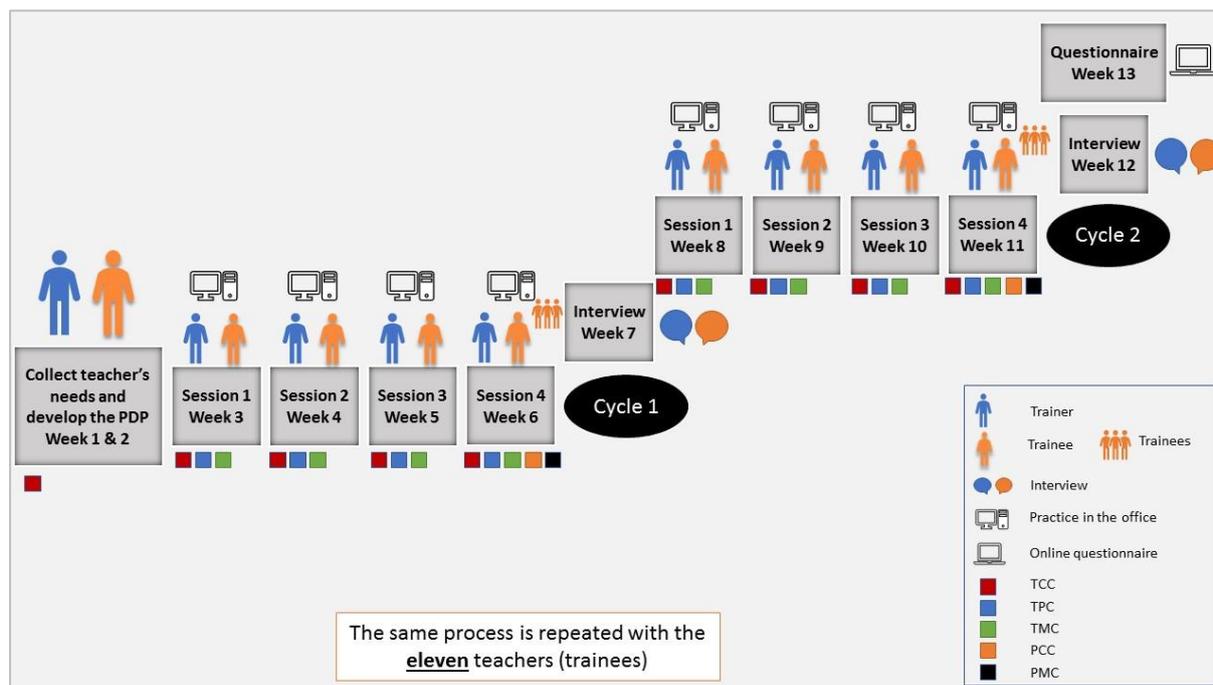
Figure 4.2: Implementation of the PDP

In week 1, the researcher/facilitator met individually with each teacher face-to-face for one hour to gather details about their needs, to gain an initial understanding regarding: 1) the courses they teach; 2) the proficiency level of each course; 3) course objectives and outline; and 4) and their preferred time for the weekly sessions. In addition, she demonstrated the idea of the PDP through a MS PowerPoint presentation that included: 1) the goal of the PDP; 2) the pedagogical benefits of CSCL activities; 3) what was expected from her and themselves in the different phases of the PDP; and 4) the role of Blackboard as a tool for accessing resources and interacting with other colleagues. In addition, during this session, the researcher/facilitator asked them if they had any questions before proceeding.

In week 2, the researcher/facilitator provided teachers with: 1) the resources and how to access them through Blackboard; 2) general guidelines to take into consideration while developing the CSCL activities using Google Slides (e.g. creating a space for each student and writing his/her name on it; sharing the Google slide file with all students through the "Share" feature; and writing clear instructions for students to know what was expected from them); 3) the online computer-supported tool (Blackboard) that would enable them to access all types of resources; and 4) the spaces on Blackboard where they could upload their CSCL activities, receive feedback from their colleagues, and send feedback to their colleagues.

From weeks 3 to 5 (cycle 1 of the DBR) and from weeks 8 to 10 (cycle 2 of the DBR) the researcher/facilitator showed teachers the authentic exemplary materials with students' outcomes. The teachers were then free to ask questions and receive feedback, and/or practice designing and/or developing the CSCL activities. In addition, in weeks 6 (cycle 1) and 11 (cycle 2), the researcher/facilitator checked whether teachers sent and received feedback to and from other teachers through Blackboard or not. In case they did, they were given the choice to either: 1) send and view feedback to and from their colleagues; and/or 2) practice designing and developing more CSCL activities. In weeks 7 (cycle 1) and 12 (cycle 2), interviews were conducted and in week 13, an online open-ended questionnaire was sent to teachers.

The design of the PDP was divided into five phases in alignment with Laurillard's (2002) conversational framework. Laurillard (2012) recommended at least two cycles to assure that learning is happening. In line with that, the researcher/facilitator used the five phases of the framework more than once throughout the PDP. In the face-to-face formal sessions (refer to Figure 4.2), the researcher/facilitator used: 1) TCC ten times; 2) TPC eight times; 3) TMC eight times; 4) PCC twice; and 5) PMC twice. It is important to highlight that the PCC and the

PMC, although they were undertaken face-to-face twice under the researcher/facilitator supervision in weeks 6 and 11, could be done an unlimited number of times online and which would depend on teachers' needs.

4.3- Summary

In this chapter, the focus was on providing a detailed description of the development and implementation of the PDP. The next chapter focuses on the research design.

Chapter 5: The research design

This chapter focuses on: 1) the ontological and epistemological position of the researcher/facilitator; 2) the rationale behind using DBR; 3) DBR features and compatibility with the study; 4) how DBR was used in this study; 5) the data collection methods; 6) the data analysis technique; 7) sampling technique and participants; 8) role of the researcher/facilitator; 9) the quality criteria of this DBR study; and 10) the ethics criteria.

5.1-   The ontological and epistemological position of the researcher/facilitator

There are different world views that are recognised in research, such as post-positivism, constructivism, and transformative (Creswell, 2014). Creswell (2014) summed up the three types as follows: 1) post-positivism focuses mainly on causes, outcomes, hypothesis testing, and variables that can be tested and numerically measured; 2) constructivism focuses on how individuals view the world where they live in which they work; and 3) transformative focuses on social reform for changing the lives of the participants who are oppressed, suppressed, alienated, and disempowered.

Bryman (2012) also talked about other worldviews such as: 1) positivism which focuses on applying natural science to social reality; and 2) interpretism which focuses on subjective meaning that respects the differences between people in social action.

Considering these, the researcher/facilitator did not associate strongly with any of the above-mentioned worldviews, but rather associated with pragmatism because the other worldviews did not focus on finding a solution to a practical problem, which is the focus of this study. Pragmatism is a philosophical position that says that whatever works in a certain situation is what makes it valid (Johnson & Christensen, 2014) and it uses background theory concerned

with changing the world as highlighted by prominent pragmatic philosophers such as Pierce and Dewey (Barab & Squire, 2004).

Firstly, being pragmatic is important because the researcher/facilitator wanted to solve a real educational problem in a certain context. Secondly, being theoretical is important because theory would be used in a real educational setting to solve a problem (Cobb, Confrey, DiSessa, Lehrer, & Schauble, 2003). Since it was considered important to be both pragmatic and theoretical, the researcher/facilitator found DBR to be the most appropriate research design for this study. It is worth mentioning also that DBR is an applied social research that has different names, including design-experiment research in the educational research field, while in other fields, it has names such as Nth-phase evaluation and development through formative evaluation (Gomm, 2009).

5.2- Rationale behind using DBR

The objective of this study was to enable and motivate teachers to design, develop, and implement TEL activities for teaching AFL in a higher education institution using a PDP that was designed, developed, and implemented using Laurillard's (2002) conversational framework and Passey's (2011) learning elements framework. To know whether the PDP achieved its objective or not, the researcher/facilitator raised six sub-research questions that tackled: 1) how teachers perceived the PDP; 2) the pedagogic outcomes produced and how they related to the different types of support provided; 3) the positive influencers and barriers that affected teachers throughout the PDP; 4) how teachers responded to the PDP; 5) how students responded to the PDP from teachers' perspectives; and 6) what the design principles are for an effective implementation of a PDP.

Thus, the research objective and sub-research questions entailed: 1) a practical contextual problem that needs to be tackled; 2) the design, development, and implementation of an intervention (PDP); 3) the use of theory for guiding the design, development, and implementation of the PDP; and 4) the generation of a set of design principles for a successful design, development, and implementation of a PDP.

To achieve the objectives of this study and to develop/validate the theory used in designing, developing, and implementing the intervention, several applied and/or evaluative research designs could be used such as: experimental research, action research, and case study research. For example: 1) experimental research focuses on controlling variables in laboratory settings following certain procedures in addition to testing hypotheses (Bryman, 2012); 2) action research aims to simply design and develop a solution for a certain contextual problem to improve practice (Johnson & Christensen, 2014) but it does not aim to generate design principles (Plomp, 2013); and 3) case study research focuses on describing, comparing or evaluating a phenomenon (Yin, 2014).

Unlike the above-mentioned research designs, DBR has other characteristics that help in reaching the objectives of this study. For example, Kelly (2013) mentioned certain points regarding the appropriateness of using DBR as a research design. She said that it is appropriate when: 1) previous trainings were consistently found unsuccessful; 2) the content knowledge is new; 3) the instructional materials are not available; and 4) teachers' skills and knowledge are unsatisfactory. In this study, the one-hour training course that had previously been conducted for training teachers on how to design TEL activities was not successful and therefore teachers' knowledge was not satisfactory as they did not benefit from the training. In this context, all the points which Kelly (2013) mentioned were met and therefore DBR was considered appropriate for this study.

5.3- DBR features and compatibility with the study

In this section, a number of features of DBR are presented and then how they relate to the study are highlighted. For example, in the literature, DBR is highlighted as being: 1) context based, as context plays an important role in defining the problem (Amiel & Reeves, 2008); 2) interventionist, because the researcher designs an intervention in a real setting for solving an educational problem (Wang & Hannafin, 2005); 3) iterative, because the process includes more than one cycle of analysis, design, development, evaluation, and revision (Reeves, McKenney, Herrington, 2011); 4) collaborative, because the researcher, practitioners, and the technology expert work together throughout the different phases (Lai, Calandra, & Ma, 2009); 5) process-oriented, because the focus is on improving the intervention (Plomp, 2013); 6) utility-oriented, because the effectiveness of the intervention is measured through its practicality for certain users in authentic contexts (Plomp, 2013); 7) theory-driven, because the intervention is built on a theoretical framework that guides the process for contributing to theory (Plomp, 2013); and 8) flexible, since it uses qualitative and/or quantitative methods for collecting data (Alghamdi & Li, 2013). In addition, it uses design principles to guide the design of the intervention (Plomp, 2013) and uses technology as a means for educational reform (Anderson & Shattuck, 2012). Moreover, it provides an encompassing explanation of the learning process (Gravemeijer & Cobb, 2013).

In addition, it has more features related to its 1) usefulness, 2) focus, 3) importance of theory, 4) design principles, 5) context, and 6) challenges. Firstly, in terms of its usefulness in the educational field, DBR is used for: 1) designing and developing interventions with practitioners and technical facilitators for solving practical educational problems in context through multiple iterations (Plomp, 2013); 2) producing new theories (Barab & Squire, 2004); 3) validating existing theories (Plomp, 2013); 4) providing insights for reforming educational

practice (Alghamdi & Li, 2013); 4) bridging the gap between theory and practice for addressing real contextual problems (Wang & Hannafin, 2005); 5) improving educational practices (Reeves et al., 2011); 6) linking educational research to real contextual problems (Brown, 1992); 7) studying learning in a real world and not in laboratories (Collins, Joseph, & Bielaczyc, 2004); 8) deriving research findings from formative evaluation (Nieveen & Folmer, 2013); 9) refining theories of learning (Design-Based Research Collective [DBRC], 2003); and 10) generating design principles (Plomp, 2013).

Secondly, in terms of focus, Plomp (2013) has mentioned that DBR can vary in focus between: 1) development studies; 2) validation studies; or 3) a combination of both development and validation studies. Firstly, development studies focus on developing research-based solutions for solving complex educational problems. Secondly, validation studies focus on designing learning environments for validating theories related to the process of learning. Thirdly, a combination of both development and validation studies focus not only on developing a solution for a contextual problem, but also on validating the theory used in designing the solution when implemented in that context.

Thirdly, in terms of the importance of theory in DBR, the DBRC (2003) mentioned that although learning theories suggest having productive learning outcomes, they will not be understood unless innovative solutions and learning conditions are developed and created. As a result, these theories will be more powerful if they are validated in various contexts (Plomp, 2013).

Fourthly, in terms of design principles, it is worth mentioning that DBR generates heuristic design principles (according to Plomp, 2013) that are workable in certain contexts and does not guarantee success in other contexts, and the strength of the generated design principles

increases when validated in different contexts. Nieveen and Folmer (2013) highlighted several purposes of the produced design principles for different target groups, including: 1) researchers; 2) educational designers; 3) future users; and 4) policy makers. For researchers, the principles contribute to the knowledge base by showing how the intervention works in real settings. For educational designers, they help in designing similar interventions in similar settings. For future users, they provide rich information regarding the implementation conditions. For policy makers, they help in making certain research decisions for addressing complex educational problems.

Fifthly, in terms of context, it is worth highlighting that DBR sees context as a central motivation for conducting the study, and therefore context plays an important role in understanding the learning process for the sake of meaning-making (McKenney, Nieveen, & Van den Akker, 2006). It is also experimental, but not in the sense of conducting controlled experiments in laboratories, but it experiments with the usefulness of the intervention in a certain context for formatively evaluating its effectiveness in solving that contextual problem (McKenney et al., 2006).

Sixthly, in terms of challenges, O' Donnell (2004) mentioned that it is difficult to generalise because of the complexity of implementation in the setting. However, it is important to highlight that in other research designs such as case studies and experimental research, the researcher tries to generalise the findings to a certain theory, but that does not happen automatically, but through replication in various contexts (Yin, 2014). The same happens in DBR; generalisation to a wider theory could happen through replicating the same design principles in multiple settings (Plomp, 2013) and through that, Gravemeijer and Cobb (2013) saw generalisability in DBR studies as a way for supporting learning in other settings when

found successful in a certain setting. Nevertheless, the success of the design principles in more than one setting will not enable us to generalise, as Cronbach (1975) highlighted.

Based on the above, the question that arises now is: How is this study compatible with DBR? Table 5.1 summarises how this study is compatible with DBR characteristics.

Table 5.1: Compatibility of the study with DBR

DBR criteria	How these were used in the study
Contextual problem	The study aims to solve a certain contextual problem which is to enable and motivate teachers to design, develop, and implement TEL activities for teaching AFL.
Usefulness of the generated design principles	The findings can be useful for building knowledge of Laurillard's (2002) conversational framework and Passey's (2011) learning elements framework since it intends to close the gap between theory and practice.
Theoretical frameworks used	Laurillard's (2002) conversational framework and Passey's (2011) learning elements framework were used as theoretical frameworks for designing, developing, and implementing the PDP.
Focus	The study is concerned with both development and validation. The researcher/facilitator developed an intervention (PDP) for addressing the contextual problem and for validating the theoretical frameworks used (Laurillard's (2002) conversational framework and Passey's (2011) learning elements framework) in designing that intervention when implemented in the target context.
Technology	The researcher/facilitator used technology as a tool for developing the PDP and that is highlighted in detail in the next chapter.
Number of iterations	Two cycles.

5.4- How DBR was used in this study

DBR does not treat educational research as a black box with randomised trials, but rather monitors the success or failure of designed artefacts reviewed through intervention that provide feedback. This feedback may inform learning theories resulting in theory revision and

artefact redesign (McKenney et al., 2006). In addition, DBR can engineer instructional

materials, which include those in TEL environments, for studying an educational

phenomenon that aims to reach a certain educational goal (Bell, Hoadley, & Linn, 2004).

To that end, the researcher/facilitator used Reeves's (2006) four iterative phases to conduct

this study. According to Reeves (2006), DBR goes through four iterative phases as follows: 1)

analysis of the practical problem; 2) development of an intervention; 3) evaluating and testing

the intervention; and 4) documenting and reflecting on all phases to produce new design

principles. Table 5.2 shows how each phase was implemented in this study.

Table 5.2: DBR phases and how each was tackled in the study

Phases of the DBR	How the phase was tackled
1- Analysis of the problem	The problem was stated in the introduction chapter (section 1.2) and further advocated by the results of other empirical studies presented in the literature review.
2- Development of an intervention	The intervention was developed in reference to the literature review and two theoretical frameworks which are Laurillard's (2002) conversational framework and Passey's (2011) learning elements framework. It took the researcher/facilitator two weeks to develop the intervention in cycle 1 and one day to enhance it in cycle 2. Both of the two cycles together were implemented in eight weeks.
3- Evaluating the intervention	The evaluation of the intervention was done throughout the two DBR cycles using different data collection methods such as semi-structured interviews, open-ended questionnaires, and observation of artefacts. Both the semi-structured interviews and the open-ended questionnaire were designed in reference to Laurillard's (2002) conversational framework and the literature review. However, the artefacts (CSCL activities) were evaluated in reference to Passey's (2011) learning elements framework.

Phases of the DBR	How the phase was tackled
4- Documenting and reflecting on all the phases to produce new design principles	The reflection on the two cycles are presented in the results (chapter 6) and the findings (chapter 7). However, the generated design principles are presented in the findings section (section 7.6).

5.5- Data collection methods

Firstly, in DBR studies, different approaches can be used for data collection (Alghamdi & Li, 2013) and that depends on the nature of the research questions. In this study, the researcher/facilitator used qualitative data collection methods rather than quantitative ones. Quantitative methods focus on numbers, researcher's points of view, theory testing, generalisation, and behaviours in artificial settings (Bryman, 2012). Qualitative methods focus on words, participants' points of view, contextual understanding, and meaning in natural settings (Bryman, 2012) and as highlighted by Johnson and Christensen (2014), qualitative research has a set of features. For example, it is: 1) exploratory in nature; 2) subjective; and 3) contextual. In addition, it: 1) aims to understand individuals; 2) uses a deep-angle lens to examine the depth and breadth of a phenomenon; 3) studies individuals in natural settings; 4) collects qualitative data and uses descriptive data; and 5) uses direct quotations from the participants.

Secondly, the focus of this DBR study was on exploring the response (perceptions and outcomes) of a group of participants towards a certain intervention in a natural setting and the researcher/facilitator wanted to know what the participants thought in their own words to understand the outcomes in a deeper way. For these reasons, the researcher/facilitator found qualitative data collection methods suitable for this DBR study. It is worth highlighting that the researcher/facilitator is neither interested in making generalisations nor trying to control any conditions to measure the effect of the intervention as may be the case in quantitative

research that focuses more on testing a theory or a hypothesis in a laboratory. As such, the researcher/facilitator used qualitative data collection methods to answer the six sub-research questions while quantitatively representing them, but that does not make it a mixed-method study in the sense of data collection, only in the sense of outcome presentation. Other research studies used qualitative data collection methods only in their DBR studies such as those done by Ada (2018), Cooper (2017), Fazio and Gallagher (2018), Iversen and Jónsdóttir (2018), Koivisto et al. (2018), and Koivisto, Niemi, Multisilta, and Eriksson (2017).

Thirdly, it is important to highlight that in qualitative research, the researcher is the research instrument and as Maxwell (2013, p.87) mentioned, "eyes and ears are the tools you use to gather information and to make sense of the data". The researcher/facilitator used the data collection methods shown in Table 5.3 for collecting the qualitative data and to also show how these data collection methods related to the evidence required to address the sub-research questions.

Table 5.3: The frequency of how each data collection method was used and when

Method	Use	Frequency	RQs
Semi-structured interviews	Used for understanding perspectives (Maxwell, 2013).	Twice: once in each cycle	Sub-RQ1 Sub-RQ2 Sub-RQ3 Sub-RQ5
Qualitative online open-ended questionnaires	Used for providing a self-report qualitative data which participants filled in by themselves (Johnson & Christensen, 2014) to complement data collected from the semi-structured interviews (Marshall & Rossmann, 2011).	Once after cycle 2	Sub-RQ1 Sub-RQ2 Sub-RQ3 Sub-RQ5
Observation of artefacts	People may not always do exactly what they say, so observation is important (Marshall & Rossmann, 2011) to complement the semi-structured interviews and the open-ended questionnaire. In this context, the researcher/facilitator examined the artefacts as a form of observing teachers' responses throughout the PDP.	Daily throughout the two cycles	Sub-RQ4

The semi-structured interviews were conducted twice, once in the first cycle and once in the second cycle. In terms of the duration, in cycle 1, it took around an hour, and in cycle 2, it took around 30 minutes from each participant for the interview. The interviews were conducted in English language inside each participant's office and then audio recorded for transcription by the researcher/facilitator. The researcher/facilitator used English language because participants spoke English fluently and all their school and university studies were in English in addition to being employed in an English-speaking university, so they were able to express themselves freely without any language barriers. The questions were mainly used to answer Sub-RQ1 (How did teachers perceive the PDP?, from cycles 1 and 2), Sub-RQ2 (What types of pedagogic outcomes are produced and how do they relate to the ways that teachers used different forms of support?, from cycles 1 and 2), Sub-RQ3 (What are the positive influencers and barriers that affected teachers throughout the PDP?, from cycles 1 and 2), and Sub-RQ5 (What are students' responses towards the TEL activities from teachers' perspectives?, from cycle 2). It is worth mentioning that the design of this method was informed by Laurillard's (2002) conversational framework, the learning design literature review (facilitator support, exemplary materials, manuals, and collaborative medium that included feedback exchange and reflections), and the organisational learning literature (influencers and barriers, and pedagogic outcomes)

In cycle 1, the semi-structured interviews included questions related to: 1) teachers' perceptions regarding the different types of support provided in the PDP such as the facilitator support, exemplary materials, manuals, and collaborative medium (Blackboard); 2) how each type of support affected their learning; 3) teachers' suggestions for enhancing the PDP for the second cycle; 4) how they perceived the PDP in terms of its clarity and flexibility; 5) how they perceived certain tasks such as reflecting on their own work in addition to giving and

receiving feedback to and from their colleagues; and 6) what kind of emotions they felt while going through the PDP.

In cycle 2, the researcher/facilitator was interested to know teachers' perceptions regarding the new enhancements implemented in cycle 2. In addition, other questions were related to: 1) how time affected their learning; and 2) whether the TEL activities helped in reaching the claimed objectives mentioned in the literature. Moreover, the researcher/facilitator was interested to know how students responded to the TEL activities created by the teachers and how that affected their students' learning from their own point of view. Finally, the researcher/facilitator was interested to know the main personal factors or characteristics that the teachers felt had enabled them to be successful in the PDP.

The online open-ended questionnaire was developed using Google Slides and was shared with each teacher separately. This online open-ended questionnaire was used once at the end of the two cycles to double check teachers' perceptions towards the PDP and to check if they had changed what they said in the semi-structured interview that was conducted in cycles 1 and 2. They were used to answer Sub-RQ1 (How did teachers perceive the PDP?); Sub-RQ2 (What types of pedagogic outcomes are produced and how do they relate to the ways that teachers used different forms of support?); Sub-RQ3 (What are the positive influencers and barriers that affected teachers throughout the PDP?); and Sub-RQ5 (What are students' responses towards the TEL activities from teachers' perspectives?, from cycle 2). It is worth mentioning that the design of this method was informed by Laurillard's (2002) conversational framework, the learning design literature review (facilitator support, exemplary materials, manuals, and collaborative medium that included feedback exchange and reflections), and the organisational learning literature (influencers and barriers, and pedagogic outcomes).

In the online open-ended questionnaire, the researcher/facilitator included questions that aimed to know the positive influencers, barriers, motivators, and de-motivators that affected their ability to design, develop, and implement the TEL activities throughout the PDP. In addition, most of the questions from the semi-structured interviews were also included.

The artefacts were collected daily and examined throughout the implementation of the PDP to answer Sub-RQ4 (How did teachers respond to the PDP? from cycles 1 and 2). The artefacts were in the form of 1) the on-screen video-recorded reflections; 2) the on-screen video-recorded feedback/comments; and 3) the TEL activities designed, developed, and implemented. The TEL activities were examined using Passey's (2011) learning elements framework, while the videos were examined using themes that emerged from the learning design and the organisational learning literature review including reflection, feedback, and collaboration.

Finally, it is worth mentioning that the questions included in the semi-structured interviews and the open-ended questionnaire were checked by the supervisor for their validity in terms of being likely to provide answers to address the sub-research questions and any comments were addressed accordingly. In addition, other qualitative data collection methods such as a focus group was not used because the researcher/facilitator did not want the opinions of participants to affect each other.

5.6- Data analysis technique

Both inductive and deductive thematic data analysis were used for analysing the data gathered from the semi-structured interviews. However, deductive data analysis was only used for analysing the data gathered from the online open-ended questionnaire. Deductive thematic data analysis is theory-driven, creating an a priori template of codes informed by theory

(Harding, 2013), while inductive thematic analysis is data-driven, allowing themes to emerge from the data (Harding, 2013).

The researcher/facilitator used these types of analysis in addressing the following sub-research questions:

- **Sub-RQ1 (**How did teachers perceive the PDP?**):**
    1. Deductive data analysis for analysing data collected from the semi-structured interviews that were conducted in the two cycles using:
        - Laurillard's conversational framework (2002) for creating the a priori codes that included the following themes: researcher/facilitator support; manuals; exemplary materials; collaborative medium; and perceptions towards the PDP.
        - The themes that emerged from the literature review for creating the a priori codes that included: feedback received from colleagues; and reflections.
        - Themes that emerged from teachers' suggestions for enhancing cycle 1 of the PDP.
    2. Inductive data analysis for extracting data themes that emerged from the semi-structured interviews.
    3. Deductive data analysis for analysing data collected from the open-ended questionnaire using the same a priori codes that were used in the semi-structured interviews.
- **Sub-RQ2 (**What types of pedagogic outcomes are produced and how do they relate to the ways that teachers used different forms of support?**)**

1. Deductive data analysis for analysing data collected firstly from the open-ended questionnaire and secondly from the semi-structured interviews using the a priori codes that emerged from the literature such as: knowledge gain; organisational action and application; and change in attitudes.

- **Sub-RQ3 (**What are the positive influencers and barriers that affected teachers throughout the PDP?**)**

    1. Deductive data analysis for analysing data collected from the semi-structured interviews and the online open-ended questionnaire that were conducted in the two cycles using:

        - The themes that emerged from the literature review for creating the a priori codes that included positive influencers and barriers.

- **Sub-RQ4 (**How did teachers respond to the PDP?**)**

    1. Deductive data analysis for analysing the data collected from examining the artefacts (TEL activities) using Passey's learning elements framework (2011) that included the following a priori codes: 1) internalisation; 2) internal cognitive processing; and 3) externalising.

    2. Inductive data analysis for analysing the data collected from the other artefacts such as the on-screen video recorded reflections and the exchanged video-recorded feedback/comments.

- **Sub-RQ5 (**What are students' responses towards the TEL activities from teachers' perspectives?**)**

    1. Deductive data analysis for analysing the data collected from the semi-structured interviews and the online open-ended questionnaire using the a

priori codes that emerged from the literature review such as: pedagogical responses; social responses; and affective responses.

- **Sub-RQ6** (What are the design principles of an effective implementation of a PDP?)

  1. All the findings from the previous five sub-research questions contributed to answer the sixth sub-research question. Deductive data analysis using Laurillard's (2002) conversational framework was used to assign the design principles to its fives phases (TCC, TPC, TMC, PCC, and PMC) in addition to the themes (support elements) emerged from the literature review.

It is worth highlighting that, in the deductive data analysis that was used in the semi-structured interviews, open-ended questionnaire, and examining the artefacts (designed, developed, and implemented TEL activities), the researcher/facilitator applied a process used by Fereday and Muir-Cochrane (2006). This process included the following steps, it: 1) developed a code manual to manage and organise data; 2) tested the reliability of the codes through coding data samples collected from the different data collection methods; 3) summarised the transcripts by summarising the main points raised by the participants; 4) applied the template of codes to text for identifying meaningful units; 5) connected codes to identify themes across all data sets and then clustered them all to relate to the relevant research question; 6) read texts, codes, and themes several times to check for accuracy and add interpretations; and 7) sought interpretive rigour by adding quotations from raw data to strengthen the credibility of the research and to make interpretations linked to the words of participants.

Moreover, in the inductive data analysis used in analysing the semi-structured interviews, the researcher/facilitator used the same process used by Fereday and Muir-Cochrane (2006), but without using steps 1, 2, and 4. In addition, in step 6, the researcher/facilitator did not read

codes, because the data were not theory driven. In addition, in the inductive data analysis that was used in analysing the artefacts resembled in the on-screen video-recorded reflections and feedback, the researcher/facilitator: 1) listened to each video more than once; 2) transcribed and summarised the main points; and 3) created themes for covering the summarised points.

Finally, all the data were reviewed and analysed by the researcher/facilitator several times in different time intervals to enhance confidence regarding the results and the findings.

5.7- Sampling technique and participants

It was important to select the participants who could help in answering the research questions (Nieveen & Folmer, 2013). For that reason, the researcher/facilitator used a purposive sampling technique. This technique is about recruiting participants who have certain characteristics (Johnson & Christensen, 2014) that best enable the researcher/facilitator to answer the target research questions (Maxwell, 2013). The researcher/facilitator recruited participants who were willing to design, develop, and implement TEL activities for teaching AFL.

In this study, the researcher/facilitator, for the sake of confidentiality, referred to participants using P(n) where n is equal 1 to 11 since they were eleven participants and the P is an acronym for the term "participant". Concerning their backgrounds, all participants were Egyptians with an age ranging from 45 to 65 years. They were instructors with a Master's degree in teaching Arabic as a foreign language. Their work experience ranged from 10 to 39 years. Only three of them were working in administrative positions (chair of the department, director of the CASA programme, and director of the diplomat programme) along with their positions as instructors during the PDP. Most of the students they were teaching throughout

this study were international students, except for two teachers who had Egyptian students in their classes.

Concerning technology use, participants in the target context did not design, develop, or implement TEL activities before using the tools described in the previous chapter (section 4.1.5). In addition, in their teaching, they depended only on Microsoft (MS) Word and MS PowerPoint for developing exercises and presenting material. In addition, they were aware of Blackboard as a learning management system, but only a few of them used it for organising and uploading material to be accessed by students online. They also used the internet inside classes for accessing videos from YouTube to show to their students.

Based on these details, participants in the target context had no experience in designing TEL and therefore they needed explicit attention and appropriate support to help them create their own TEL material (McKenney et al., 2015).

5.8- Role of the researcher/facilitator

Firstly, the researcher/facilitator was an insider and was not considered a stranger in the target context. On the one hand, researchers such as Plomp (2013) and McKenney et al. (2006) advocated the idea of having an insider researcher in DBR because practitioners would not be as open to outsider researcher; and being open for the sake of collaboration with the researcher is needed. On the other hand, McKenney et al. (2006) said that having an outsider researcher could be beneficial for objectivity.

Secondly, in DBR, the researcher needs to work in collaboration with a technical expert and practitioners to solve the contextual problem (Plomp, 2013). However, in this study, the researcher/facilitator played three roles (see section 1.5), due to her learning and work

experience that enabled her to: 1) identify the contextual problem; and 2) design, develop, and implement the intervention (PDP).

5.9- The quality criteria of this DBR study

There are several issues that should be taken into consideration while conducting a DBR study for assuring quality, such as: 1) the educational problem; 2) the role of the researcher; 3) transferability of the findings to similar settings; 4) the validity and reliability of data gathered; and 5) the pitfalls behind using formative evaluation. These issues are highlighted and then drawn together to show how they relate to this study.

Firstly, the solution for fixing the educational problem should have certain quality criteria as described by Plomp (2013), such as relevance, consistency, practicality, and effectiveness. Relevance, which is also referred to as content validity, focuses on finding a need for developing the solution. Consistency, which is referred to as construct validity focuses on having a logically designed solution. Practicality has two branches: 1) expected; and 2) actual. Expected practicality expects that the solution will be usable in the target context. Actual practicality focuses on having a usable solution in the target context. Effectiveness has two branches as well: 1) expected; and 2) actual. Expected effectiveness focuses on having desired outcomes after implementing the solution. Actual effectiveness focuses on having desired outcomes as a result of implementing the solution in the target context.

Secondly, the researcher can have three roles, such as being the designer, the implementer, and the evaluator. Accordingly, there might be conflicts of interests as highlighted by Plomp (2013), but these can be at least reduced as far as possible by: 1) making research open to critique; 2) having a high quality research design; 3) using a strong chain of evidence and reasoning; 4) using triangulation; 5) testing the effectiveness and practicality of the

intervention; and 6) being attentive to the reliability and validity of data collection methods. McKenney at al. (2006) also proposed certain guidelines for developing scientific research: 1) having a conceptual framework that is based on the review of literature; 2) applying a strong chain of evidence within each cycle of the DBR; 3) using triangulation; 4) applying both inductive and deductive data analysis; and 5) using a rich description of the context, design, and research results.

Thirdly, the ability to transfer the findings to different contexts is prominent in qualitative research. To achieve that, the researcher should add thick description in the results to help decision makers make judgements about transferring the findings to different contexts (Bryman, 2012).

Fourthly, the validity and reliability of data gathered should be seriously taken into consideration. That can happen through triangulation, which means cross-checking more than one source of evidence against another (Gomm, 2009). There are different types of data triangulation, including data source triangulation, methodological triangulation, theoretical triangulation, and respondent triangulation (Johnson & Christensen, 2014). Data source triangulation is about using two or more sources of data where they can be collected in different phases and at different points in time. Methodological triangulation is about using different methods for collecting data. Theoretical triangulation is about comparing the understanding of the data using different theories. Respondent validation is about member checking, where the participants judge the researcher/facilitator's interpretation of the collected data.

Fifthly, the pitfalls that could occur because of using formative evaluation in DBR should be addressed. For example, Nieveen and Folmer (2013) mentioned two pitfalls: 1) having the

designers of the intervention becoming too attached to it, leading to being less objective

towards the comments and problems provided by the participants; and 2) having the

participants less critical due to their awareness of the effort exerted during the design of the

intervention.

Based on the above points, Table 5.4 shows how the researcher/facilitator assured quality as

far as possible in this DBR study.

Table 5.4: Quality criteria

Criterion	How this was addressed
1- Relevance/content validity	The study was focusing on developing a solution (PDP) for enabling teachers to design, develop, and implement TEL activities for teaching AFL because they were not able to do that in the target context for the reasons mentioned before in section 1.2.
2- Consistency/construct validity	The solution to the problem was logically designed because it used two theoretical frameworks which were Laurillard's (2002) conversational framework and Passey's (2011) learning elements framework in addition to outcomes of the literature review for guiding the design, development, and implementation of the PDP.
3- Practicality	The intervention was expected to be practical because it would be used in the target context by participants to design, develop, and implement TEL activities and advocated by Laurillard's (2002) conversational framework and the literature review. In addition, its actual practicality is highlighted in the findings chapter to judge whether the solution was usable in the target context or not.
4- Effectiveness	The intervention was expected to be effective because it focused on having desired outcomes after implementing it, such as teachers being able to design, develop, and implement TEL activities for teaching AFL. That was advocated by Laurillard's (2002) conversational framework and the literature review. However, for actual effectiveness, that is highlighted in the findings chapter, which judges whether the desired outcomes were achieved as a result of implementing the solution in the target context or not.
5- Making research open to critique	The researcher/facilitator presented parts of the research in international conferences, and that opened it up to critique. In addition, the researcher/facilitator used a critical friend to read the research findings. All the comments guided the researcher/facilitator throughout the study.

Criterion	How this was addressed
6- Having a high-quality research design	The researcher/facilitator used: • Two theoretical frameworks (Laurillard's (2002) conversational framework and Passey's (2011) learning elements framework) and peer-reviewed articles for the design, development, and implementation of the intervention (PDP). • The two frameworks and the literature were used in the design of the data collection methods and analysis. • Three data collection methods (semi-structured interviews, open-ended questionnaire, and observation of artefacts) were used at different time intervals. • Deductive and inductive data analysis techniques were used. • A chain of evidence was always presented throughout the study by relating it to references from different sources that were prominent in the field of learning design and organisational learning. In addition, an extended amount of time in the fieldwork was spent to study the effect of the PDP on the participants as advised by Johnson and Christensen (2014).
7- Chain of evidence and reasoning	The reasons behind designing, developing, and implementing the PDP were highlighted by referring to the literature review and the two theoretical frameworks.
8- Triangulation	• Data methodological triangulation (semi-structured interviews, open-ended questionnaire, and observation of artefacts) was used. • Methodological triangulation was also used in the way shown in Figure 5.1. It is worth highlighting that each sub-research question methodologically triangulates the results of the other ones. For example, Sub-RQ1, Sub-RQ2, Sub-RQ3, Sub-RQ4, Sub-RQ5, and Sub-RQ6 focused sequentially on: 1) teachers' perceptions (semi-structured interviews and the online open-ended questionnaire); 2) the relationship between support types and pedagogical outcomes (semi-structured interviews and the online open-ended questionnaire); 3) positive influencers and barriers (semi-structured interviews and the online open-ended questionnaire); 4) teachers' responses (observing the artefacts); 5) students' responses from teachers' perspectives (semi-

Criterion	How this was addressed
8- Triangulation	structured interviews and online open-ended questionnaire); and 6) the design principles (all of the previous). Figure 5.1: Sub-research questions • Data source triangulation was used since the data were collected from the participants and the produced artefacts.
9- Rich description of the context, design, and research results	• A rich description was provided of: 1. The context in chapter 1. 2. The design of the PDP in chapter 4. 3. The research results in chapter 6.
10- Reliability and validity	• For validity checking, the researcher/facilitator piloted the semi-structured interview questions with the first interviewer. In addition, she checked these with the online open-ended questionnaire questions with the supervisor to make sure that the questions were as reliable and valid as possible for answering the sub-research questions. • For reliability checking, the same questions posed in the interviews were also included in the online open-ended questionnaire that was administered to participants at different time intervals. From that, the researcher/facilitator checked whether teachers' words changed or not over time.
11- Transferability	The researcher/facilitator added thick description in the results chapter through adding excerpts from participants' responses. The data were visualised using different levels of analysis to help the reader understand the data deeply and not superficially, to provide a better understanding of what was

Criterion	How this was addressed
11- Transferability	done and achieved. As a result, this might help decision makers make judgements about transferring the findings to different contexts.
12- Formative evaluation threat from the researcher/facilitator and the participants	Firstly, the researcher/facilitator was aware of the threat of becoming too attached to the intervention leading to being less objective towards the comments and problems provided by the participants. To avoid that, she asked the participants in the first cycle to give suggestions for enhancing the intervention further for the second cycle. Enhancing the intervention was part of the process to be able to proceed to cycle 2. That would not have been achieved if the researcher/facilitator did not have the concept of enhancing the intervention for meeting participants' needs/suggestions for enhancing cycle 1 (the researcher/facilitator took some teachers' needs/suggestions into consideration in cycle 2).

In addition, the researcher/facilitator evaluated the PDP using semi-structured interviews to allow participants to voice their opinions freely. She also used an online open-ended questionnaire at the end of the two cycles to give them the opportunity to express their opinion in another medium and to double-check whether they changed their opinions or not over time.

Secondly, the researcher/facilitator was aware of the possibility that the participants would be less critical due to their awareness of the effort exerted during the design of the intervention (PDP). As a result, the researcher/facilitator did not depend only on participants' perceptions collected from the two semi-structured interviews and the online open-ended questionnaire, but also collected data from artefacts for triangulation. Accordingly, she used her ears and eyes to have more confidence regarding the data collected that might eventually affect the findings. |

5.10- Ethics

Firstly, the researcher/facilitator submitted an ethics application to the Ethics Committee in Lancaster University which was approved. This ethics application highlighted the main tasks that teachers would undertake in the study, such as: 1) designing, developing, and implementing TEL activities using different types of support provided by the researcher such as researcher/facilitator support, exemplary materials, manuals, and a collaborative medium;

2) having an interview; and 3) completing an online open-ended questionnaire. Accordingly, teachers were aware of the workload that they were asked to undertake throughout the study before signing the consent form. In addition, the ethics application highlighted that: 1) teachers could withdraw from the study whenever they wanted; 2) teachers could benefit from the study by supporting them in the design, development, and implementation of TEL activities for teaching AFL; 3) teachers' positions and internal/external relationships would not be affected if they decided to withdraw from the study; and 4) there were no risks or disadvantages identified behind participating in the study. In addition, pertinent information included in the ethics application was:

1.   Participants signed a consent form stating that they agreed to participate voluntarily in the research and could withdraw as needed.

2.   All data were saved in a safe password-protected database.

3.   Participants' names were anonymised and were referred to using pseudonyms.

4.   The researcher/facilitator had no influence on participants' jobs, roles or security of tenure and had no kind of power over them by any means.

Secondly, it is worth highlighting that throughout the whole duration of the PDP, participants did not indicate any ethical concerns, but continued in their willingness to be involved. Also, teachers' needs were always taken into consideration by the researcher/facilitator in order to make them feel comfortable and that is why two of the participants highlighted in the results of Sub-RQ1 (the Results Chapter) that they wanted to go on to cycle 2 of the DBR because they benefitted from cycle 1. However, it is worth stating that the researcher/facilitator was not aware of all teachers' concerns which they might face throughout the PDP. For example, one of the teachers (refer to the results of Sub-RQ1 in the Results Chapter) highlighted that she sometimes might not give exact feedback/comments to her colleague because that

colleague is more senior than her and she would feel embarrassed to critique her. That shows that there might be a power relationship between participants that the researcher was not aware of. Nevertheless, the researcher, even after hearing such comment from that participant, was always keen to make everyone feel comfortable throughout the entire process of the PDP.

5.11- Summary

This chapter covered the ontological and epistemological position of the researcher/facilitator, the rationale behind using DBR, data collection methods and analysis (see Figure 5.2), sampling technique, role of the researcher/facilitator and the quality criteria used to assess the quality of this DBR study. The next chapter presents in detail the results of the first five sub-research questions.
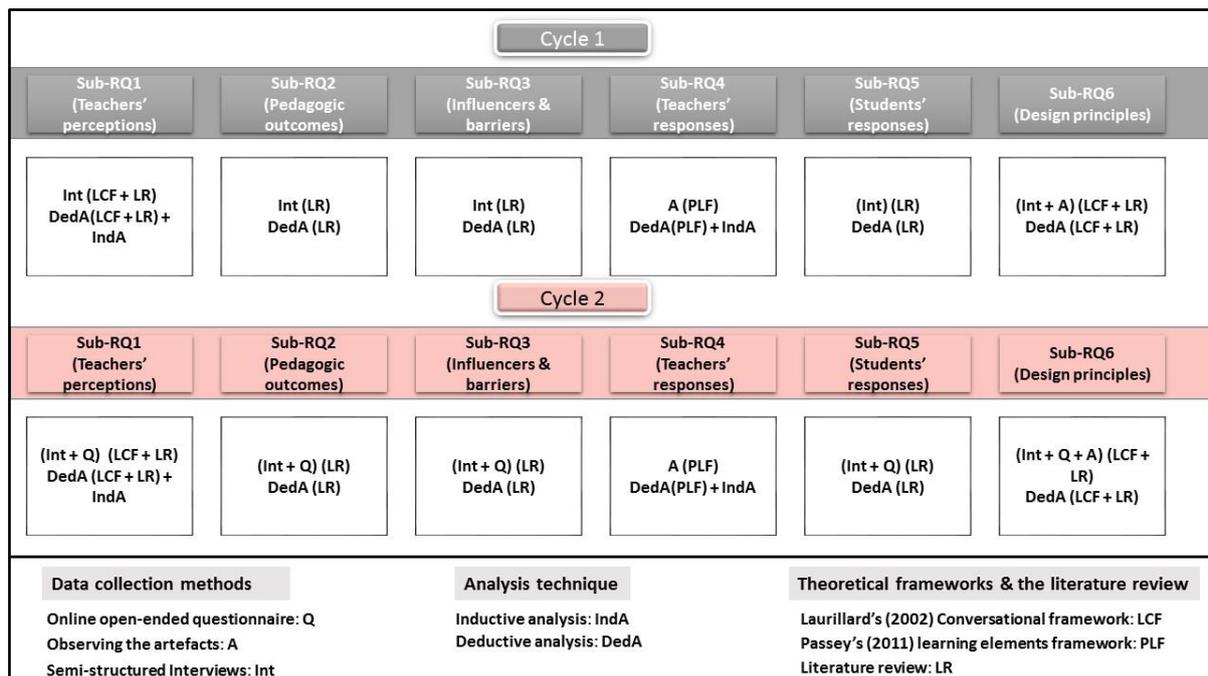
Figure 5.2: Research design summary

Chapter 6: Results

This chapter focuses on presenting the results collected from three data collection tools (semi-structured interviews, online open-ended questionnaires, and observation of artefacts). Accordingly, this chapter is not focusing on highlighting a discussion or analysis of results as this takes place in chapter 7.

The results are summarised first, followed by an illustrative range of participants' experiences represented through quotations in their own words portraying and capturing multiple perspectives. The aim is to: 1) augment and solidify the results through providing supporting samples of quotations; 2) build detail for the reader; and 3) provide an opportunity for readers to enter the participants' worlds.

It is worth highlighting that: 1) sub-sections 6.1.1 to 6.1.8 represent the data gathered in cycle 1; 2) sub-sections 6.1.9 to 6.1.11 represent the data gathered in cycle 2 because they were concerned with the enhancements made on cycle 1; and 3) sub-section 6.1.12 represent data gathered from cycles 1 and 2.

6.1 – Sub-RQ1: How did teachers perceive the PDP?

This sub-research question focuses on how teachers perceived the PDP from their own points of view. In this context, perceive means to express opinion in their own words. To collect evidence through teachers' own words regarding how they perceived the different phases of the PDP and the support tools provided in each phase, 22 semi-structured interviews in the two cycles were recorded, lasting between 45 to 60 minutes in cycle 1 and around 30 minutes in cycle 2. The interviews were transcribed, resulting in a total of 76,329 words.

To answer this sub-research question, the researcher/facilitator used deductive and inductive thematic data analysis as highlighted in section 5.6. All data analysed through both approaches are reported in the following sub-sections.

6.1.1- Researcher/facilitator support (cycle 1)

The results are highly significant in terms of teachers' reporting a positive attitude towards the researcher/facilitator support. All participants (11 of 11 [100%]) perceived the researcher/facilitator support positively, in terms of: 1) being patient while training them; 2) facilitating the PDP; 3) understanding their needs; and 4) encouraging them throughout the process. Among the comments cited were:

> The facilitator was very helpful and understanding. Understanding of what I wanted to give to my students … I gave her an idea and she helped me to build various activity designs. P(4)

> The facilitator was very patient, taking everything step by step, especially that I am away from technology … She gave me a great push. P(5)

> I do not have the confidence, in my abilities, in applying any educational tools to my classes … gives me the confidence, the encouragement, that in any difficulties, I could go back and have some advice or suggestions to enhance my activity. P(8)

There were other comments also that spoke favourably about the researcher/facilitator support, in terms of providing them with: 1) ideas for designing the CSCL activities; 2) new ways of teaching; and 3) an online space for holding all resources related to the PDP. For instance, P(2) said: "First I take what you give me exactly as is and then I try to think how can I change to meet my goals and objectives at the class more" and P(11) commented: "Opened new windows, a new vision in my teaching. I enjoyed very much exploring the different

possibilities of material development through Google Slides. Having everything saved in Blackboard makes me feel very much confident. I view it as a reference."

Other reasons that showed positive attitude towards the researcher/facilitator were: 1) accessibility; 2) giving punctual feedback; 3) taking their needs into consideration; 4) having one-to-one sessions; and 5) giving them the chance to practice. For example, one of the participants reported that:

> This was the most useful type of support because you were available. I could get feedback on the spot, while I am doing the work, and that facilitated it very much… I was thinking about that a couple of days ago. I learned from these sessions much more than I learned from the sessions where all teachers are there, because it was adapted for my specific needs and that helped me so much more than sitting in a general session where you learn about principles, but you do not actually implement. P(3)

They also acknowledged: 1) the clear demonstration of the tasks to be done; and 2) the availability of the manuals and the exemplary materials. For example, P(6) expressed that in the following way: "She facilitated everything for us in the manuals, not only the manuals but a detailed explanation from her to do the design and she gave us a lot of exemplary materials, which helped us a lot before design the activity."

Another participant also acknowledged the support given by the researcher/facilitator to the students whenever needed especially that she lacked the knowledge that could assist her in helping them. P(8) in this regard said: "I think the facilitator is the most important factor, in the process, since I am not that experienced in technology... If the students ask me, I can go back to you or the students could go back to you directly, which makes things easier for me."

In the same vein, P(9) talked about the importance of having fixed allocated time given to the face-to-face sessions as that drove her to be dedicated to the PDP during her busy day at work and she said: "Without knowing that you are coming to me from this time to this time… I would not have done it. Visiting me in the office made it much easier."

One of the participants also showed a positive attitude towards the just-in-time support given by the researcher/facilitator. She expressed this point as follows: "She was aware and following up and ready, whenever there is a problem to help me solve it while designing" P(5).

It is worth highlighting here that the results of this sub-section are discussed in the next chapter in sub-section 7.1.1.

6.1.2- Exemplary materials (cycle 1)

Most participants (10 of 11 [90.9%]) found the exemplary materials helpful, but for different reasons. One of the reasons was because it gave ideas for designing activities on their own. For example, P(2) said, "I take the gist of these activities first and I do them the same and then I thought about changing and doing my own." Other participants also acknowledged having students' responses included in the exemplary materials to visualise how other students perceived similar activities. For example, they said:

> You shared with me your activities… and you showed me the students, their work which you designed and their feedback… and these were really very helpful … I managed to bring up my ideas of what I want to do in my classroom. P(5)

> Help a lot to see exactly what will be the activity, how can I put it, how can the students receive it. P(6)

It was nice to see specific samples of work, so I did consult it. P(10)

Another participant talked about the importance of having exemplary materials because this shows how to use technology practically, especially for teachers who are beginners in integrating technology in teaching by saying, "It can make things alive … especially, as an inexperienced teacher in using technology" P(8).

Although the majority highlighted the benefits they gained from the exemplary materials, one (1 of 11 [9%]) mentioned that she did not depend on them by saying: "I didn't use them that much" P(7).

It is worth highlighting here that the results of this sub-section are discussed in the next chapter in sub-section 7.1.2.

6.1.3- Manuals (cycle 1)

Most participants (8 of 11 [72.7 %]) showed a positive attitude towards the manuals, but they expressed this differently. For example, one said that she referred to them whenever she faced any difficulty while using the technology tool. She expressed this point as follows:

Whenever I was stuck in something, I would just go to the manual and I know the way exactly, how to do it. P(2)

Others highlighted that having the manuals in the form of videos compared to text benefited them because they: 1) allowed them to follow the instructions easily; and 2) saved them time because they did not have to use time to read manuals. In addition, they liked the fact that the manuals included detailed instructions and explanations that showed them step-by-step with the cursor how to use Google Slides. For example, they said:

They explain everything, I could watch a video more than once, pause and see where the cursor goes. The fact that it is a video, I prefer that to manuals, reading. Reading takes so much time and you have to visualize what happens but watching a video tells it all and in a very short time. P(3)

For me the video manuals are more helpful than the readings because sometimes the reading, when I read the manual, it takes me a long time to look for the icon itself, because I am not that acquainted with all icons on the computer or on the screen, so when in a video, the arrow moves directly to the icon and this saves me a lot of time, so this movement speeds up the process. P(8)

Only one participant of the eleven highlighted that she did not use the manuals and referred to the instructions given by the researcher/facilitator instead in the face-to-face sessions because she did not have time. She said:

I did not get the time to do this, but I listened carefully when you were sitting with me. I was a little bit overwhelmed with the classes I am teaching. P(5)

It is worth mentioning also that three participants (3 of 11 [27 %]) highlighted a few obstacles that they faced while using the manuals such as: 1) feeling stressed when left alone to use them; 2) being distracted since there was no sound guiding them; and 3) being long. For example, P(9) said that she did not use the manuals because she felt stressed to use them when left alone to do the work. She expressed that point as follows: "The first time we worked on the video, you were with me, so you were directing me… on how to use it, and this was perfect. When I uploaded the work, and I started to do it by myself, I found myself kind of lost, and I was overstressed."

In the same vein, P(7) conveyed that she used the manuals only to remind her of how to use Google Slides. She further mentioned that having the manuals with no sound in the video made her exert more effort to search for the cursor on the screen. She said:

> I did not use them that much… Whenever I forget… I am not young anyway… I was a bit lost because there was no sound, I mean, with the video, but next time, I understood what was going on. I think I remembered after that, it is helpful to have manuals to help people do this job.

One of the participants also mentioned that the video manuals benefited her, but she was afraid to use them at the beginning. For instance, she said:

> At the beginning, they looked a bit scary to me, I was not encouraged enough to see the manuals. Sometimes, I feel lost in manuals, in general, but the way they were put, or at least some of them, was very helpful. P(11)

It is worth highlighting here that the results of this sub-section are discussed in the next chapter in sub-section 7.1.3.

6.1.4- Teachers' online video-recorded exchanged feedback (cycle 1)

The results indicate that most participants (8 of 11 [81.8%]) perceived the online video-recorded feedback that they exchanged with their peers through the collaborative medium to be useful.

Among the comments cited, P(8) acknowledged the importance of receiving peer feedback to enhance the CSCL activities further, especially that they are all beginners in using technology. She commented:

> They suggested some activities or how to enhance for future work… especially at this stage which we are… in the novice level, so, this will help me to carry on the activity

in a more challenging, a more advanced, so I am taking also the advice from a pedagogical aspect.

Other participants also talked about the trustworthiness of the prompt feedback they received from their peers and how this made them see their activities from different perspectives. Two participants reported this point as follows:

The feedback was given in a very honest and open manner and it was just very accessible and very timely. P(10)

Providing feedback from other colleagues helps you see the whole picture. P(11)

Another participant also mentioned that receiving constructive feedback from her colleague encouraged her. She commented as follows:

The positive feedback made me more confident… She presented the design so much better than I did. P(3)

P(10) also acknowledged the usefulness of receiving feedback from her colleagues in a safe environment. For example, she said: "I feel very supported… it is a very collaborative atmosphere… Everyone speaks in good faith and very openly and very honestly, we are old colleagues."

One of the participants also reported that the feedback she received from her colleagues encouraged her to exchange ideas and share work during informal talks in a positive environment. She expressed that as follows:

Informal chats, maybe it comes up with ideas that we did not record… The teachers, they are excited about it so they are sharing with me… I do not think, if I am working on my own, I will get this constructive feedback… It is positive energy. P(8)

Although most participants benefited from colleagues' feedback, two participants (2 of 11 [18%]) said that they did not, for different reasons. For example, P(7) highlighted that the feedback she received did not benefit her and she could do the PDP tasks independently without peers' feedback. She expressed that as follows: "I did not really get additional ideas. My professional development objective is to learn something and be able to use it and I am doing it already. But, so far, I have not heard anything that really made me feel yes, I need to change this or that." In addition, P(9) mentioned that her limited time hindered her from listening to peers' feedback. She said: "From my colleagues, I did not have the time, or the luxury to listen to them."

Only one participant (1 of 11 [9 %]) reported feeling nervous to give true feedback to her peers. She said, "I feel embarrassed to give feedback, so I actually cannot give what I wanted to give… Because I feel that sometimes she is a very, famous or very excellent teacher, so it is something as a shame to give her a feedback" P(4).

It is worth highlighting here that the results of this sub-section are discussed in the next chapter in sub-section 7.1.4.

6.1.5- Teachers' on-screen video-recorded reflections (cycle 1)

The results indicate that all participants (11 of 11 [100%]) perceived the reflections shared among the collaborative medium to be useful. For example, P(1) found it useful because sharing the activities online paved the way for exchanging information since they were not allowed to do that before as they were not even meeting face-to-face. In this regard, she said: "I am meeting them online, although we do not meet face-to-face every day, but I can now contact them through these activities and share with them every new detail."

Another teacher also talked about how reflection enabled her to rethink again about her activities. She commented:

> When you reflect on your work… You find your point, your weak point and your strong point. P(4)

In the same vein, P(5) said that reflection allowed her to exchange ideas with her peers online as that would not have happened with sharing their work on the collaborative medium (Blackboard). She elaborated on that and said:

> If not, I will not get access to what they are doing and they will not get access to what I am doing… but sharing this via Blackboard and we see an actual design… so I got the opportunity to see by myself, what they are planning for their classes, and then get an idea, and they get an idea from what I am doing for my classes, so this was an excellent, practical experience that we shared with each other.

In addition, one of the participants acknowledged having the shared online activities accessible whenever needed for reference useful. She recalled the following:

> Yes. It is very helpful, because when you put it on Blackboard and every time I want to know something I can open it, it is saved, I can find it anywhere, anytime. P(6)

P(8) also mentioned that she learned about the different features of Google Slides from her colleagues' shared activities. She expressed that as follows:

> Sharing the idea of someone used the block, others used the picture, others used the recording, the song, whatever, Google tools, sharing, it opens our minds to how we can use all these feature in teaching or in designing the activity.

One participant also highlighted that she learned about students' responses to the activities from her colleagues' reflections. In this regard, she said:

> She says that she has three students only, two participate, the other one prefers to write on paper. It gives you an idea about how students receive these activities. P(11)

It is worth highlighting here that the results of this sub-section are discussed in the next chapter in sub-section 7.1.5.

6.1.6- Computer supported collaborative learning (cycle 1)

Most participants (10 of 11 [90.9 %]) found that through the CSCL activities students were able to: 1) share and build knowledge collaboratively; 2) solve problems individually and collaboratively; and 3) raise cultural awareness. For example, one said:

> In all my activities, I felt that I shared and built knowledge with, in a collaborative way, with my students, we worked together, they worked first at home and we came to class and discussed all the activities and also we tried to solve all the challenges… Secondly, in both classes, I felt that these activities facilitated the learning environment and it helped the students to solve problems individually and also collaboratively… Regarding cultural awareness, because the activities included themes related to Egypt, to women in the Arab world, also revolution in Egypt, in 2011, 2013. I tried in all my activities to relate these events to whatever happens in the students' own country. P(1)

Another participant highlighted how the CSCL enhanced class time as it enabled students to: 1) focus on the task; 2) give feedback to each other; and 3) follow each other's work. For example, she commented:

It facilitated collaboration between students, and when we did them in class, after the students brought their laptops, we spent very fruitful time, focusing on tasks, thinking, it was… much better than just on a sheet of paper because then you can discuss the answers and give feedback while everyone is following. P(3)

P(6) also said that CSCL created a positive learning atmosphere among students. For example, she expressed this point as follows: "The digital technology tools which I liked very much… put them in a very good environment and they had fun too."

Although most teachers found CSCL useful, one teacher (1 of 11 [9 %]) perceived its application with students negatively because they did not want to type in Arabic and favoured the paper and pen instead. She highlighted that although she expected students to get engaged in the activities, they did not because they wanted to use their mobile telephones for other purposes. This is pointing to an issue of how students have access to technologies in classrooms that detracts from how teachers want them to work. P(7) expressed her point as follows:

First, I thought maybe that will attract the students… I really wanted to take them out of their phones, ok, and the first session, when they turned on the computer they were very excited but they were very upset because they did not have time to look to their phones… So they did not really respond as effectively as I believed. P(7)

It is worth highlighting here that the results of this sub-section are discussed in the next chapter in sub-section 7.1.7.

6.1.7- Google Slides (cycle 1)

All participants (11 of 11 [100 %]) perceived Google Slides as a technology tool for designing and developing CSCL activities positively because it enabled them to: 1) enhance students' learning; 2) make students think and work in a creative way; and 3) enable students to work collaboratively and individually both inside and outside the class boundaries. For example, one of the participants said:

> It helped me as a teacher but also it helped the students to foster their learning. As a teacher, it gave me a chance to think out of the box, to let the students explore other domains of learning and also it enabled the students to work in a different environment, outside the class, inside the class, individually, collaboratively, which is something that is not possible to do with paper and pen only. It is a very creative tool that gives them the chance to successfully develop their language. P(1)

Another participant talked about the tool from a technological perspective, highlighting its ease of use that enabled her to add pictures, videos, and audio files. In addition, she acknowledged the fact that she can update the content and give instant feedback to students through it easily. She expressed these points as follows:

> It is easy to use and it has lot characteristics that are very good. I can do a lot with it… I can put on it visuals, I can put on it videos, very easily, I can have audio put on it as well, it is there, it does not disappear, I can change on it, on the spot, I can correct students' mistakes on the spot on it. P(2)

One of the participants also talked about how flexible the tool was in designing activities with different language skills and objectives in addition to being able to support the Arabic language. Another participant also acknowledged the auto-save feature that made her

unworried about the need to save the file all the time. The two participants commented as follows:

> Flexible… You can use it for different purposes, different skills. Some fonts are not there… but writing from right to left, changing, fixing the direction no problem. P(3)

> You can save it all the time, no problem about to forget to save… It is a fantastic tool. P(6)

Another participant also talked about the interface of Google Slides and how it looks like MS PowerPoint as such similarity facilitated its use. She also acknowledged its usefulness during application inside the class as it engaged the students in the activity effectively because everyone: 1) knows his/her own role in the activity; 2) can access everyone's work; and 3) can exchange feedback. She expressed that as follows:

> I did not have difficulty working with it… I think it is much easier than even the MS PowerPoint which I was quite sure of. It gave me many options to apply whatever we want... I found the Google Slides very effective, because this appeared in my classes, the students preferred such technique and strategy better than just coming to class ready with the vocabulary, the novel, and start discussing it. They found having this on computer is very effective, because we divided work among all the students, they all have access to look at others' work and give feedback and have the things done in the appropriate time and not having the burden of trying to engage each other in their own activity. P(5)

P(7) also highlighted that Google Slides is helpful for designing the layout of the activity easily unlike other sophisticated technology tools. For example, she said:

It is very easy to design…. You have a slide and you can… put graphical presentation of your thoughts. In the other tools it was hard to remember.

Moreover, P(8) highlighted that the tool enabled her to: 1) use it anywhere easily; 2) design different activities; 3) insert pictures, audio, text, and video; and 4) ask students to record their speaking. She said that these features allowed her to be creative in integrating more than one skill in one activity, so the tool from her point of view can serve her objective in any course she teaches. She expressed the above points as follows:

It is an easy tool for any teacher. It is available, anywhere and I can use it. It does not need that much of technical support, until now… It allows me of course to make different designs… I feel that it is a friendly tool, I do not have to go through many complicated steps. The features are there, and I pick whatever I want… The text and the sound and the pictures… The students record the speaking. Inserting a video… All this helps me to be more creative and to stimulate the students' interest, specially, if I am trying to integrate the all skills together, they write and they produce and they listen.

One of the participants also highlighted that Google Slides allowed her to visualise the activities she wanted to give to her students. However, she complained about the short length of the slide dimension as that did not allow her to add long texts. She expressed that as follows:

It made me enter, it made me go to a different world, of visualizing what I am doing, I found it more suitable for my character, which I like having everything in front of me… However, it did not work very well with longer articles, when it came to reading because I had to crop the articles to make them short to fit in one page. P(9)

Another participant compared Google Slides as a tool to a goldmine because previously she used to make presentations to simulate students' learning, but through this tool, the students can collaborate and correct each other's work on the slides. In addition, she acknowledged how Google Slides allowed her to: 1) add videos, pictures, and sound; 2) change font size and colour; 3) change text direction; and 4) share the file with her students allowing them to work collaboratively. She expressed that as follows:

> It is like a goldmine for me. Before, I used to do everything on MS PowerPoint and it was only from my side to the students, it was only a sort of presentation or explanation or whatever to stimulate conversations in class, to stimulate discussions, etc. But this one is collaborative. The students have a part in it and they can share and they can correct each other, they can comment on each other. P(11)

It is worth highlighting here that the results of this sub-section are discussed in the next chapter in sub-section 7.1.8.

6.1.8- Suggestions for enhancing cycle 1 (cycle 1)

Teachers reported different suggestions for enhancing cycle 1. For example, P(1) requested to shorten the video manuals and said: "Maybe the manual needs to be a little bit shorter because I found it to be a bit long."

Another participant suggested to have a bank of activities categorised by language skills to give them more ideas. For example, she said:

> Many exemplary activities. To be categorized… use it in a media class, use it in a listening and speaking class, more ideas. P(8)

In addition, one of the participants suggested to have a bank of templates categorised by students' language proficiency level to adjust and use according to their own needs. She expressed this point and said:

> If we can have a bank for the different types of activities from all of us, maybe this could be easier for us to just go and see… and then we can take and develop them to fit our own objectives… according to… level. P(2)

Another participant suggested to have face-to-face meetings with her peers for discussing the CSCL activities further as sharing the activities online asynchronously did not allow her to do that freely. For instance, she reported:

> For me, talking to the screen, or without having reaction from the other side, it does not help me to produce the language. I am talking to the screen… I am not expecting instant reply, so this, maybe, it does not hinder, but it does not make me open more to responses… not like face-to-face, or like workshops, where we can have arguments. P(8)

One of the recommendations raised by P(2) was to have a space on the collaborative medium (Blackboard) to respond to teachers' comments and/or questions. For example, she said: "If there is for example something to write on just to comment on the commenting."

Another suggestion was raised by P(7) as she wanted to have sound with the video manuals because she could not follow the cursor on the screen. She expressed that as follows: "I am really easily forgetting the stuff, I am not young anyway, so I think I saw the video of the Google Slides, twice, yes, and first time, I was a bit lost because there was no sound."

It is worth mentioning here that not all suggestions were taken into consideration in cycle 2 for enhancing cycle 1, but only the following ones: 1) shorter video manuals; 2) a feature added on Blackboard for responding to colleagues' feedback; 3) adding sound to videos; and 4) providing a bank of templates. Accordingly, sub-sections 6.1.7 to 6.1.9 are teachers' perceptions regarding the new enhancements and they were gathered in cycle 2.

6.1.9- Shared Google Slides templates with narrative explanation (cycle 2)

All participants (11 of 11 [100 %]) found the shared Google Slides templates with video-recorded narrative explanation useful. For example, P(6) acknowledged the usefulness of these templates as she could use them as is with her students. For example, she said: "This will help us not only to design the activity, no, to activate it and give it to class."

Another participant compared the shared templates to a bank of activities where she can adjust according to her own needs. For instance, P(2) said: "Finding the bank of activities is great… it gives me a lot of ideas, I can either do the same activity with different material or I can take the activities and develop it more again."

Another one said that the shared templates were convenient because they can be used as is instead of creating new activities. For example, she commented: "It makes life easy… You have something available to use, you do not have to recreate the world" P(7).

It is worth highlighting here that the results of this sub-section are discussed in the next chapter in sub-section 7.1.2.

6.1.10- Adding sound narration to templates and manuals (cycle 2)

All participants (11 of 11 [100 %]) found that adding sound narration to templates and manuals useful for several reasons. For instance, P(2) highlighted that she prefers listening to

reading because that saves her time. For example, she said: "sometimes I do not have time to read or to look at all the slides, but now I can listen to the slides while doing something else, so it saves a lot of time."

Another participant highlighted that having the template only might not benefit her as much as having the video manual accompanying it. She expressed that point as follows: "Maximum benefit from the template because sometimes, I do not find the goal, how to use this template, so, from this video, you can help me more than the template only" P(4).

> P(11) also mentioned that explaining the pedagogical objective behind using the template is useful in understanding it. For example, she said:
>
> "This is very useful, it gives me explanation of the objectives of each activity and what should be done, how to deal with or how to explain to the students what they should be doing, and why, or to justify the idea behind each step of the activity."

It is worth highlighting here that the results of this sub-section are discussed in the next chapter in sub-section 7.1.2.

6.1.11- Responding to teachers' questions (cycle 2)

All participants (11 of 11 [100 %]) found that having a feature on the collaborative medium that enabled them to respond to their colleagues' questions and/or comments positive because through it, they could: 1) clarify the activity and the goal behind it; 2) open a discussion with colleagues; 3) respond to someone's questions in terms of being polite; 4) give explanation when something is not clear or needs improvement; and 5) express their points of view.

Among the comments cited were those by P(2), who said: "I think this is great because sometimes someone has a philosophy that I cannot see, I cannot understand, and so, when I

give them my comments and then they respond to this comment then I can understand", and those by P(7), who commented: "you have to do it, as a matter of even of courtesy, professional courtesy".

In the same vein, P(8) mentioned: "it is a very important point that I can go back and give my explanation on the teachers' feedback because this means that I might need to enhance the activity, it means that something was not clear, or it means that it needs improvement… I think feedback from both sides, from the teacher and the other teachers, it is an ongoing process". P(11) also conveyed the same opinion by saying: "This is a very good tool because sometimes I want to express my side or my point of view".

It is worth highlighting here that the results of this sub-section are discussed in the next chapter in sub-section 7.1.6.

6.1.12- Perceptions towards the PDP (cycles 1 and 2)

All participants (11 of 11 [100 %]) said that the PDP motivated and enabled them to design, develop, and implement CSCL activities for a number of reasons. For example, one said that the PDP made her think positively towards the use of technology in teaching and learning. For example, she said:

> It broke ice for me. It taught me that technology is not something impossible, something that you can do, you can develop your learning and develop your teaching through. P(1)

Another participant highlighted that the PDP motivated her to design CSCL frequently. For example, she said:

I am designing every day and it is taking time but I love it and I am trying to think of

different activities every day… It is great, and all kinds of support were great really…

A big thank you. P(2)

One of the participants also said that the PDP was encouraging because: 1) it is a new way of

learning and teaching; 2) other teachers are being trained and working on the same topic at the

same time; 3) it saved her class time; and 4) there is a room for innovation. She expressed

these points as follows:

I was very motivated, enthusiastic to use it. It is a new way of introducing material in

class, dealing with material in class. There is room for innovation. You can come up

with as many ideas as you can think of. It saves class time… The fact that many of us

are working at the same thing that was very encouraging. We are all learning, we are

all doing different things, I found this very encouraging. More than any session I have

attended or training sessions I have attended before. P(3)

Another teacher highlighted how students' feedback made her feel motivated and enthusiastic

about the activities she implemented with them. That motivated her to develop more activities

as she felt students' appreciation towards using technology in enhancing their learning. She

also expressed her positive feelings when she saw her students completing the activities inside

or outside the classroom. She expressed these points as follows:

The students, their feedback made me more motivated and enthusiastic… It shows

them that I am keen to have them learn in a very comfortable atmosphere. I am not

taking easy ways, they took this impression that I am not taking easy ways to make

them learn, just a paper and a pen, and that's it. No. I am ready to create more on

technology and they love technology, so I see them carrying their laptops and working on our activities in the garden, in the classroom, so they found it easy. P(5)

Another one acknowledged learning in general and compared it to a working exercise for the brain. She said, "It is very helpful… Learning is a gym" P(7). In addition, another one said that the PDP encouraged her to use technology and without this feeling, she would not have gone to cycle 2 of the PDP highlighting that all the different types of support helped her in achieving that. For instance, she said:

All the steps and all the tools, and all the facilities here encouraged me to go on and think of something challenging, more sophisticated maybe, for the second cycle, now, maybe I can say I am in the novice, I can go to the high novice, in the second cycle. I think, if I had problems, I wouldn't be encouraged to go to the second cycle. But maybe now I am thinking of how to make something more creative, more useful and collaborative for the students. P(8)

P(9) also highlighted that the PDP was systematic and organised where all the different phases of the PDP depended on each other to create a product. For example, she said:

All the steps were very useful, were needed and they were all systematic and building on top of each other in a way that made the final product that I gave to the students possible to have.

One of the participants also pinpointed that she is motivated to design and develop activities in general for the future by saying:

I am even developing activities, even without having a plan for introducing them, I am just designing and developing the activities, and maybe I'll give them to the students this semester, maybe not, but I am enjoying doing them. P(11)

P(9) acknowledged the fact that their needs were taken into consideration prior to conducting the PDP and that was represented in the manuals. She expressed that as follows:

What you did was the perfect thing, you heard what we do regularly in class and then you created the manual, according to what we needed, so, actually, this was perfect, you do not need to do anything more than that.

Other participants acknowledged their need to continue this PDP and build further upon. For instance, they said:

I would really like this programme to continue, if possible, but I do not know, it is of course too much time and effort from the facilitator, but I think it could, by meeting online… What I would really like, is that this be the first step on which we build further. P(3)

I would like to thank the facilitator as much as I can, and I want to benefit and get her support while teaching the next semester. P(5)

Another participant said that the PDP was motivating as she learned a lot. For example, P(6) said: "I want to thank you for this programme, because it helps a lot, it is very good, it is very motivating, and I learned a lot."

Three participants described the PDP in a metaphorical way saying that all the different phases of the PDP were logically connected and coherent. They expressed that as follows:

It all work together, it is pieces or parts of something and when you put the whole puzzle

together, you make something coherent, so I believe the parts make a coherent product.

P(7)

As if it is all one piece of music going and you can not just cut parts of it. It is all going…

I could see the whole line… the whole symphony. P(9)

I am a doctor, so the happiest moment, when you deliver a baby, ok? So, this is the

same. You feel that you have an idea, you create a design, you develop, you

implement in the class, you got your feedback from the students at the same time, felt

everything, in one hour, so it gives me pleasure or let me be happy. P(4)

Having highlighted teachers' perceptions towards the different types of support in the PDP in

cycles 1 and 2 in addition to their perceptions towards the PDP as a whole, the next section

focuses on teachers' pedagogic outcomes and how they relate to the different types of support

provided. In addition, it is worth highlighting here that the results of this sub-section are

discussed in the next chapter in sub-sections 7.1.1 to 7.1.8.

6.2- Sub-RQ2: What types of pedagogical outcomes are produced and how do they relate to the ways that teachers used different forms of support?

The outcomes were collected from the semi-structured interviews and the online open-ended

questionnaire. From the way the support elements and the pedagogic outcomes associated

with them were reported, Figure 6.1 shows the pedagogical outcomes related to each type of

support: 1) facilitator support; 2) manuals; 3) collaborative medium; and 4) exemplary

materials. In Figure 6.1, each type of support is presented with a certain icon and the

pedagogical outcomes associated with these support icons emerge from the tree. For example,

the exemplary materials (green ball) as a support tool enabled teachers to achieve certain

pedagogical outcomes such as: 1) gain and implement ideas; 2) be independent; 3) design, develop, and implement CSCL activities; 4) know the pedagogical objectives of Google slide templates; 5) know the potential of CSCL; 6) imitate templates with new material; 7) know how to use Google Slides in different ways; 8) think of techniques to change the classroom atmosphere; and 9) understand how the activities are designed.
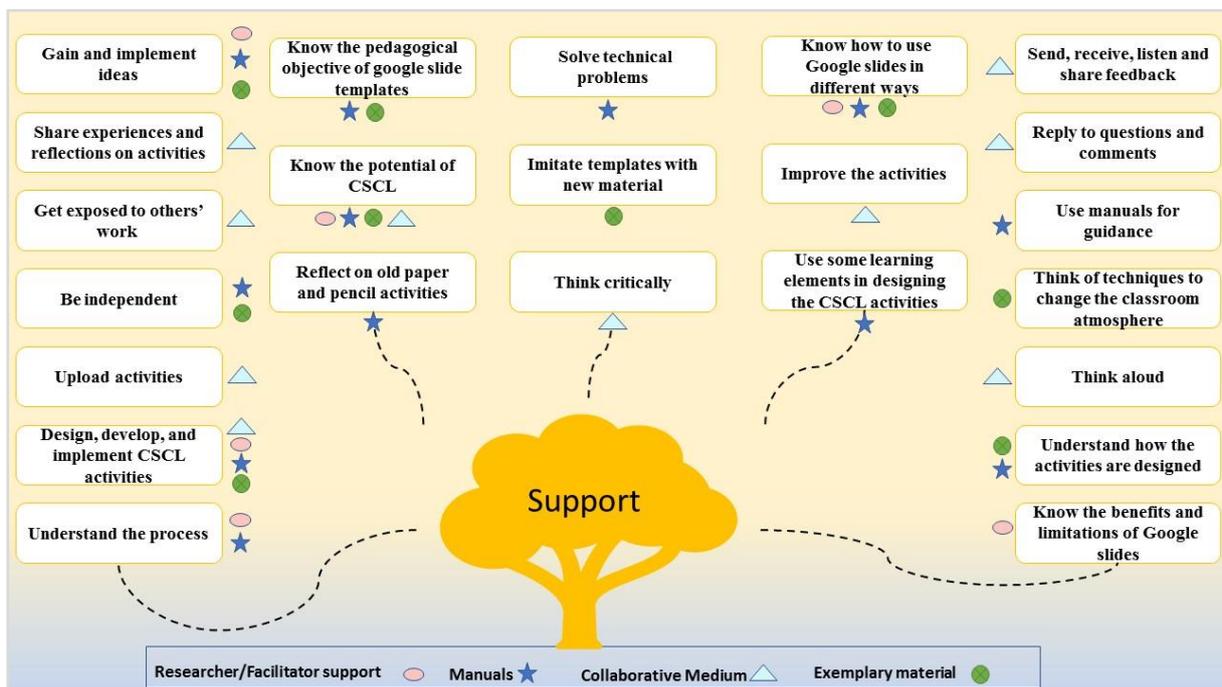
Figure 6.1: Support types and pedagogical outcomes

Having highlighted teachers' pedagogic outcomes and how they relate to the different types of support provided, the next section focuses on the positive influences and barriers that affected teachers throughout the PDP. In addition, it is worth highlighting here that the results of this sub-section are discussed in the next chapter in section 7.2.

6.3- Sub-RQ3: What are the positive influencers and barriers that affected teachers throughout the PDP?

Firstly, all participants (11 of 11 [100 %]) felt that they benefited because they: 1) gained confidence in using technology; 2) received positive feedback from students; 3) remembered how to use the tool; and 4) were encouraged by the researcher/facilitator.

Among the comments cited were those by P(1), who said: "I am intellectually and technologically rewarded, this is a big reward", and those by P(2), who commented: "I feel I am rewarding myself, because I am learning something new, and I am trying to implement it".

Moreover, P(4) acknowledged being rewarded by her students and said: "Maybe students, my students, also… Sometimes they felt that I did something which is not traditional". Another participant also highlighted that learning something new is a reward. P(7) expressed that point as follows:

> "I feel happy because I am learning something. This is a reward, this is the only reward I have, this is for myself and I enjoy learning the things so I am doing it and if I remember which button to click and know how to do this and that, this is very… I mean, a very positive feeling"

P(8) also highlighted that the reward is not materialistic but rather personal by saying: "there is no materialistic reward, but actually it gave me more confidence, that I can carry out activities, I can design, I can implement activities." Furthermore, P(10) mentioned that she is being rewarded by the facilitator's encouragement. She said: "Rewarded by the facilitator who provides the encouragement, who is always welcoming what I do."

Secondly, all participants (11 of 11 [100 %]) saw the PDP as organised, because it: 1) was well planned; 2) had certain allocated times for meeting face-to-face; 3) took both their needs

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and students' needs into consideration; 4) provided resources accessible through Blackboard and Google Drive; 5) included all the developed CSCL activities to be accessed online through Google Slides; and 6) supported their use of computers in their offices.

Among the comments cited were those by P(3), who said: " The facilitator is willing to adapt, to make all changes according to our needs, our time"; those by P(4), who commented: "I did not feel that something which you enforced me to, you have to do this, you have to do this design, no, we sat together, are brainstorming, and the activity, it depends on my students' need"; and those by P(11), who mentioned: "Yes, I can open the activity anywhere, in class, at home, and here, and it is always there, online, it is always saved, it is always accessible, I can share it with anyone, I can get advice from my mentor."

Thirdly, all participants (11 of 11 [100 %]) saw the objective of the PDP to be clear, in terms of: 1) the explanation provided by the facilitator and the manuals; and 2) going through the process themselves. Among the comments cited were:

"Crystal-clear… You explained every step very clearly, you were always to the point, you elaborated anything that was a bit challenging, or a bit unclear to me." P(1)

"It was clear, from the manuals and from the explanation of the facilitator." P(6)

"Actually, what helped me realise how clear it is, is going through the process." P(9)

Fourthly, participants highlighted that the personal factors that motivated them to go through the PDP were: 1) learning and experiencing new things; 2) favouring creative ideas; 3) being reflective; 4) loving teaching; 5) loving to motivate students; 6) being up-to-date; 7) wanting to address the fear of using technology; and 8) being open to new ideas and new teaching methodologies.

Among the comments cited were:

> "I like very much creative ideas and to think of creative ideas for students and visuals and colourful exercises and so this is what attracted me most to this professional development program." P(2)

> "I like to learn new things, new ideas, I hate to do the same thing over and over again." P(3)

> "As a teacher, I love teaching, motivating the students and when I see them motivated as the ones I have now, this pushes me a lot." P(5)

> "I think I want to overcome my fear of technology, this is the first thing, so I am challenged, I want to prove to myself that I am updated with technology." P(8)

> "I am always very open to new ideas, new methodology, new techniques, this is… I really look for, for new things, always new things, including food, including places, everything, I like to try and discover new facilities, new openings, in any field, so I am fond of learning more, and developing my teaching professionally." P(11)

Fifthly, all participants (11 of 11 [100 %]) liked the fact that the PDP was conducted over a long time period because it made them: 1) feel more relaxed and self-confident; 2) try new things; 3) develop themselves; 4) be faster in designing the CSCL activities; 5) be more innovative; 6) check more templates; 7) have a clearer vision; 8) pilot more activities; 9) use Google Slides more; and 10) be more confident. Some of the comments evidencing this were as follows:

"I tried doing new things, and I failed and then I came back to you and I asked you and you gave me other instructions and showed me how and so I developed myself and I tried to do more activities." P(2)

"More time allows more opportunities to try new things, to think in a different direction, during the first cycle, I was focused more on listening. In the second cycle, I had reading, Infographics, new directions, think in new directions." P(3)

"Now I design the activity faster." P(4)

"The time given is giving me more time to pilot material and use the tool so I think I am more comfortable now in using the tools than when we started at the beginning of the semester." P(9)

Sixthly, all participants experienced different feelings throughout the different phases of the PDP such as: 1) positivity; 2) self-fulfilment; 3) accomplishment; 4) frustration; 5) depression; 6) self-confidence; 7) happiness; 8) fear and worry; 9) stress; and 10) pride.

Participants expressed their feelings as follows:

"It is positive… I learned something that I did not know before, and I am starting to use it on my own and develop new things." P(2)

"It was positive. Other than sometimes my students, suppress… Technology needs time to prepare and to design, and to think about activity and it is not as paper." P(4)

"I see that we all participated enthusiastically, we teachers. We are all enthusiastic and all try to think of the different activities and shared them, commented on them or provided feedback, I feel this spirit among us." P(11)

"There are fears. There are worries that it will not be successful… or the program will not achieve my target." P(8)

"Some frustration, because I kept forgetting the steps, so I was frustrated with myself… but I'd say that stress can make me forget the steps." P(9)

Having highlighted the positive influencers and barriers that affected teachers throughout the PDP, the next section focuses on teachers' responses throughout the PDP. Teachers' responses include all the artefacts that they produced such as the designed, developed, and implemented CSCL activities, video-recorded feedback/comments, and video-recorded reflections. In addition, it is worth highlighting here that the results of this sub-section are discussed in the next chapter in section 7.3.

6.4- Sub-RQ4: How did teachers respond to the PDP?

To answer this sub-research question, it is important to define the term 'respond' in this context. Respond here refers to teachers' reactions made during their participation in the PDP. To collect data that related to teachers' responses, different artefacts were examined such as: 1) CSCL activities developed using Google Slides; 2) teachers' on-screen video-recorded feedback/comments that were exchanged among them; and 3) teachers' on-screen video-recorded reflections on the CSCL activities they designed, developed, and implemented. The next sub-sections show with visual data representations how teachers responded to the PDP.

6.4.1- CSCL activities

Figure 6.2 shows when and how many CSCL activities were designed, developed, and implemented by each participant in October 2017 (e.g. P(1) created one activity on October 23rd). It also shows that the total number of activities in this month was 25 (totalling the right-hand column).

Figure 6.2: CSCL activities in October

Figure 6.3 shows when and how many CSCL activities were designed, developed, and implemented by each participant in November 2017 (e.g. P(1) created three activities on November 13, 20, and 27). It also shows that the total number of activities created by all teachers was 44 (totalling the right-hand column).
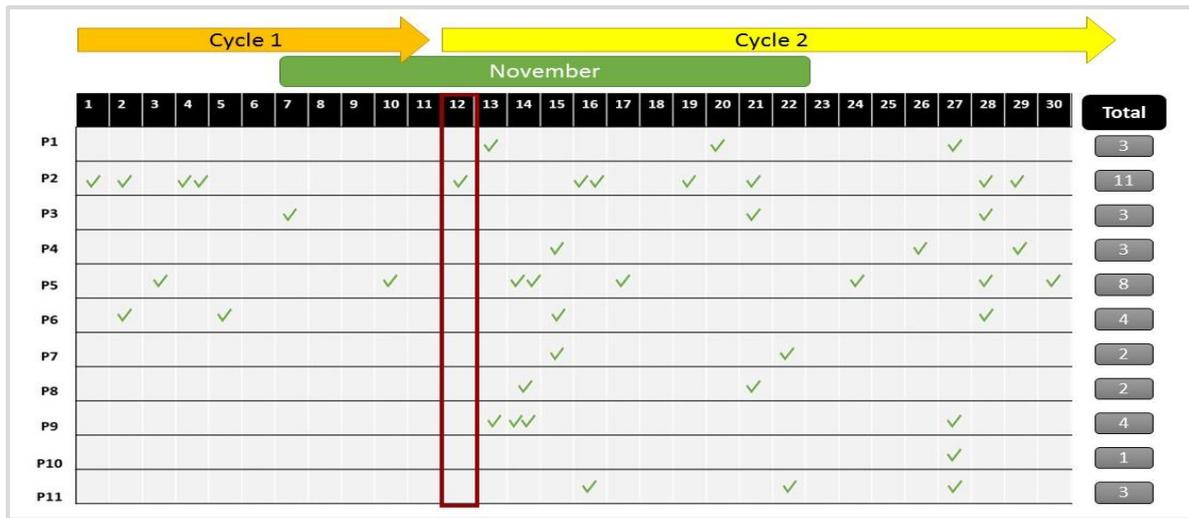
Figure 6.3: CSCL activities in November

Figure 6.4 shows when and how many CSCL activities were designed, developed, and implemented by each participant in December 2017 (e.g. P(1) did not create any activities in December). It also shows that the total number of activities created in this month by all teachers was 4 (totalling the right-hand column).
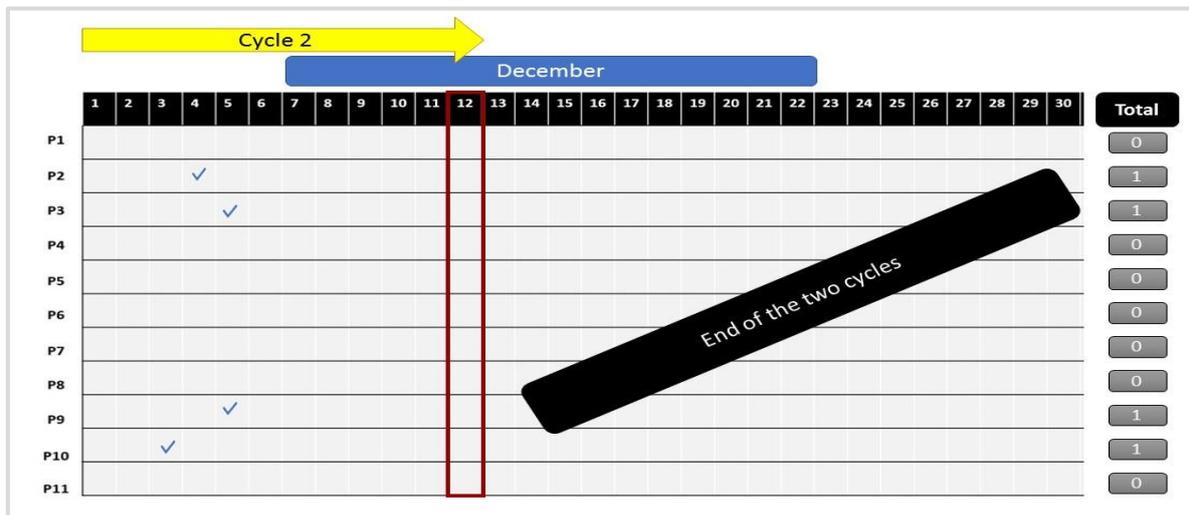
Figure 6.4: CSCL activities in December

Figure 6.5 shows the total number of CSCL activities designed, developed, and implemented by each participant in the first and the second cycle. It also shows whether there was an increase or decrease in the total number of activities between the two cycles (e.g. P(1) created

one activity in the first cycle and three activities in the second cycle, so there was an increase in the number of activities by two in this case).
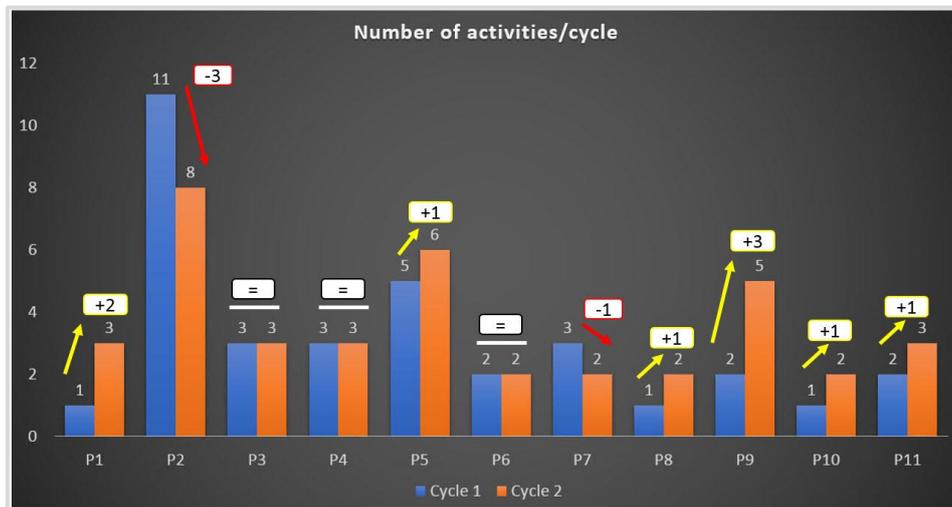
Figure 6.5: Total number of CSCL in the two cycles

Figure 6.6 shows the percentage of CSCL activities designed, developed, and implemented by all participants in the first and the second cycles (e.g. cycle 1 represented 47% and cycle 2 represented 53% of the total number of activities).
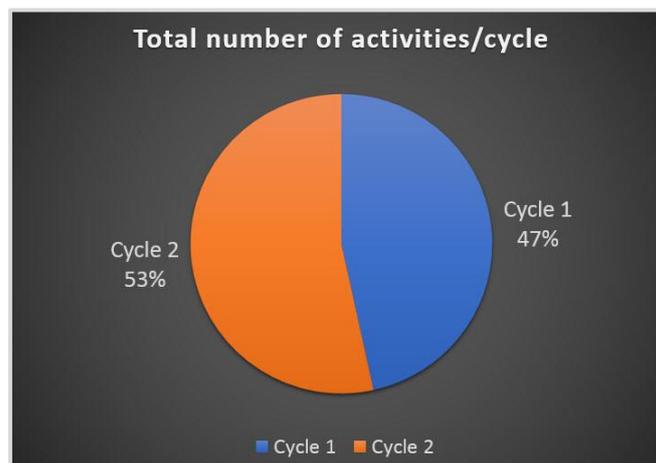
Figure 6.6: Percentage of CSCL activities in the two cycles

Figure 6.7 shows how many students answered the CSCL activities per participant. Each activity is shown as a 'petal diagram', where each petal represents a student (e.g. P(1) has 2 students and 4 fully-completed activities, while P(3) has 2 students and 6 activities where most were fully-completed except 1).
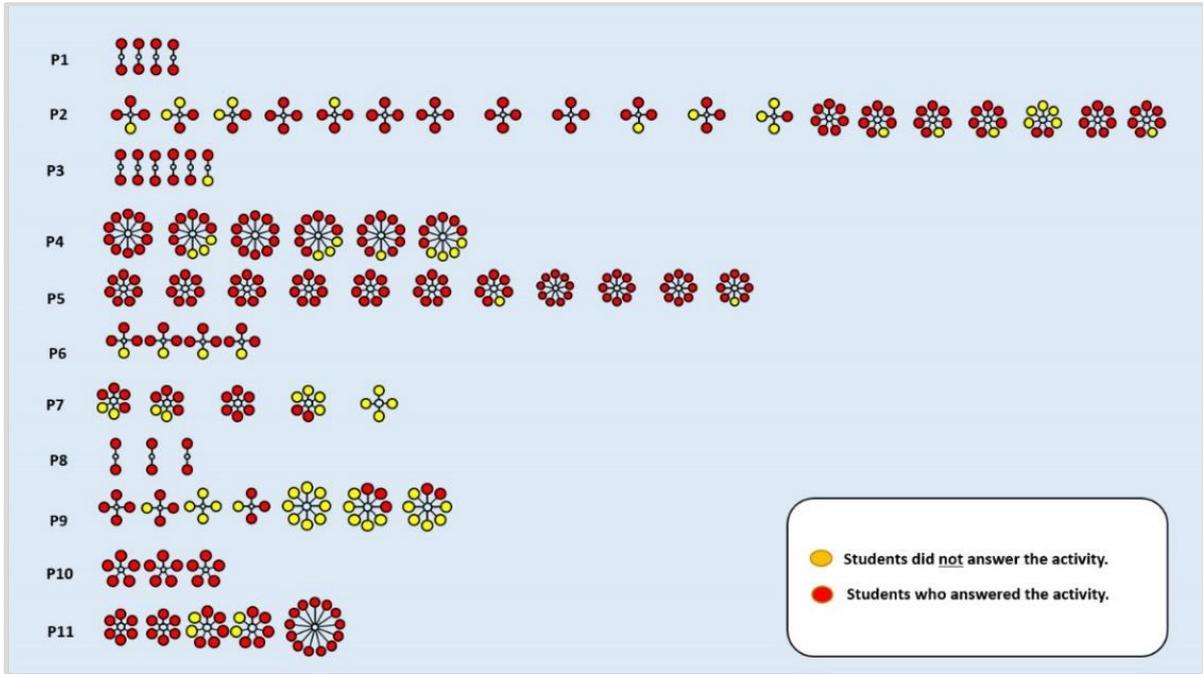
Figure 6.7: Number of activities completed by students per participant

Figure 6.8 shows the language skills tackled in each activity per participant (e.g. P(1) developed an activity for reading and writing once, writing and listening once, listening and speaking once, and writing only once; however, P(2) developed 6 activities for reading and writing and 13 activities for vocabulary). It also shows the total number of skills tackled (e.g. reading was 21) and the total number of skills tackled by each teacher (e.g. P(1) tackled 4 skills)
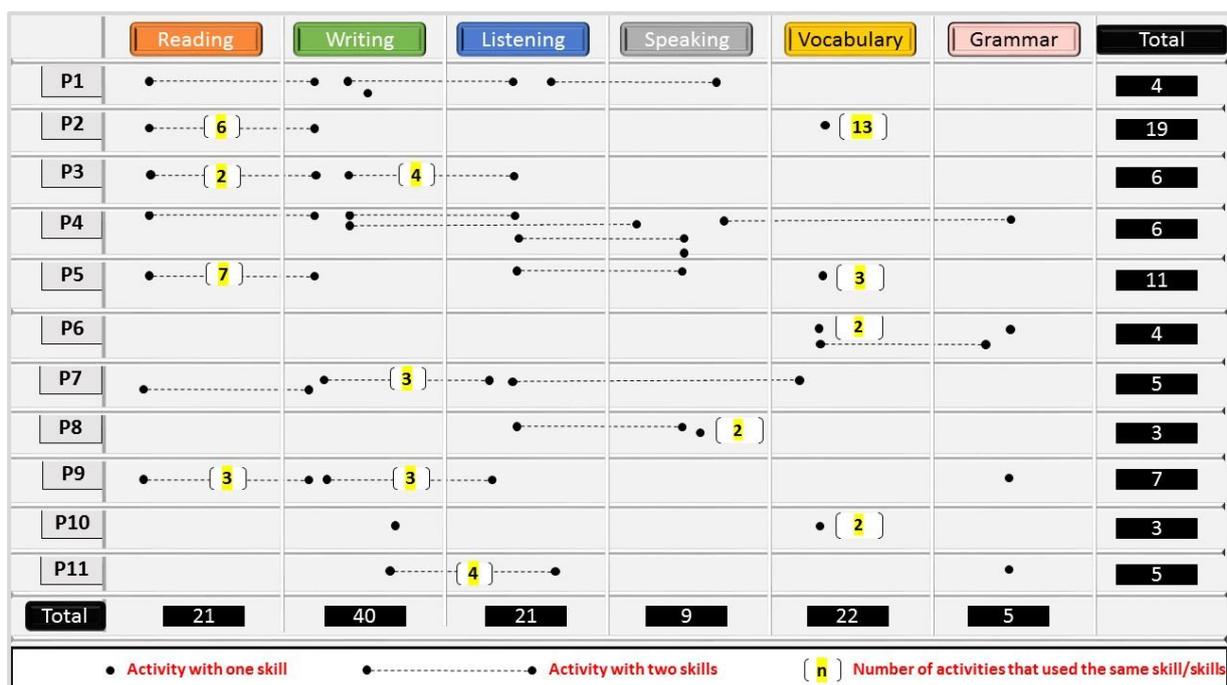
Figure 6.8: Language skills tackled per participant

In addition, Table 6.1 shows a summary of the activities developed in the different language skills.

Table 6.1: Language skills tackled by the participants

Skill	A descriptive summary of activities
Reading and writing	Students read a certain article/story and compare, critique, search for words, summarise, answer comprehension questions, and/or fill an infographic diagram. These activities targeted the high proficiency level.
Listening and writing	Students: 1) listen to a video and answer open-ended questions; and 2) fill gaps in song lyrics. These activities targeted both the high and intermediate language proficiency levels.
Listening and speaking	Students listen to videos and report what is happening in the video by recording their voice. These activities targeted high language proficiency levels.
Writing	Students: 1) describe pictures; 2) create dialogues; and 3) guess what is being said in a conversation from a picture. These activities targeted high language proficiency level.
Speaking	Students: 1) refer to a sequence of pictures and narrate a story; 2) reflect on a certain topic; and 3) report a sequence of events in a silent video. These activities targeted high proficiency level.

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Skill	A descriptive summary of activities
Vocabulary	Students drag and drop: 1) different parts of sentences together; 2) pictures and words; and 3) words to complete gaps in sentences. These activities targeted low and high language proficiency levels.
Grammar	Students: 1) complete an infographic diagram related to a grammatical rule; and 2) record their voice while applying a certain grammatical rule. These activities targeted low and intermediate language proficiency levels.

Moreover, from inspecting the CSCL activities, it was found that teachers enabled students to collaborate through the CSCL activities by: 1) dividing the task among students where each one knows his/her role by searching for his/her name next to the designated task; and/or 2) assigning the same task to all students by creating a copy for each student with his/her name on it. All students were able to view and correct each other's work since they all had access to all their colleagues' answers.

Furthermore, by analysing the CSCL activities that were developed by Google Slides using Passey's (2011) learning elements framework, certain learning elements were found in terms of the stimuli used in: 1) internalisation, 2) internal cognitive processing, and 3) externalisation. For visually representing this, Figures 6.9, 6.11, 6.13, 6.15, 6.17, 6.19, and 6.21 show how many times each participant used a form of stimulus both in cycles 1 and 2. In addition, the black cell with a zero digit means that the stimulus was not used. The red cell means that the stimulus was used in cycle 2 only. The yellow cell means that the stimulus was used in cycle 1 only.

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Firstly, in terms of internalisation (see Figure 6.9), the analysis of the CSCL activities showed that teachers were able to use different sensory stimuli during the development phase, when they started applying their design on Google Slides. For example, Google Slides allowed the use of sensory stimuli such as: 1) visual, allowing participants to insert pictures, videos, text boxes, and/or shapes; 2) auditory, in the form of adding videos; 3) kinaesthetic, in the form of using the keyboard to type texts and also through using the mouse to move objects; 4) textual, in the form of reading texts, vocabulary, and/or grammar; 5) musical, in the form of adding songs either through Google Slides or through an outside resource followed by certain questions related to that song; 6) intrapersonal, in the form of adding questions where each student answers by himself/herself; 7) interpersonal, in the form of adding questions that should be answered by more than one student collaboratively together; and 8) attention and reception were encouraged by adding instructions on each Google slide for students to answer the questions that included his/her name and also through the different range of sensory encouragement routes.

Visual

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	11	3	3	5	2	3	1	2	1	2	3	8	3	3	6	2	2	2	5	2	3

Auditory

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	0	2	1	0	0	3	0	0	0	0	1	0	2	2	0	0	1	1	3	0	2

Kinaesthetic

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	11	3	3	5	2	3	1	2	1	2	3	8	3	3	6	2	2	2	5	2	3

Emotional

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Social

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Textual

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	11	3	3	5	2	3	1	2	1	2	3	8	3	3	6	2	2	2	5	2	3

Musical

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

Interpersonal

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	11	3	3	5	2	3	1	2	1	2	3	8	3	3	6	2	2	2	5	2	3

Intrapersonal

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	11	3	3	5	2	3	1	2	1	2	3	8	3	3	6	2	2	2	5	2	3

Attention

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	11	3	3	5	2	3	1	2	1	2	3	8	3	3	6	2	2	2	5	2	3

Reception

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	11	3	3	5	2	3	1	2	1	2	3	8	3	3	6	2	2	2	5	2	3

Figure 6.9: Sensory stimuli used and not used by participants with their students

In addition, Figure 6.10 shows a bar chart that compares the total number of times each stimulus was used in cycles 1 and 2.
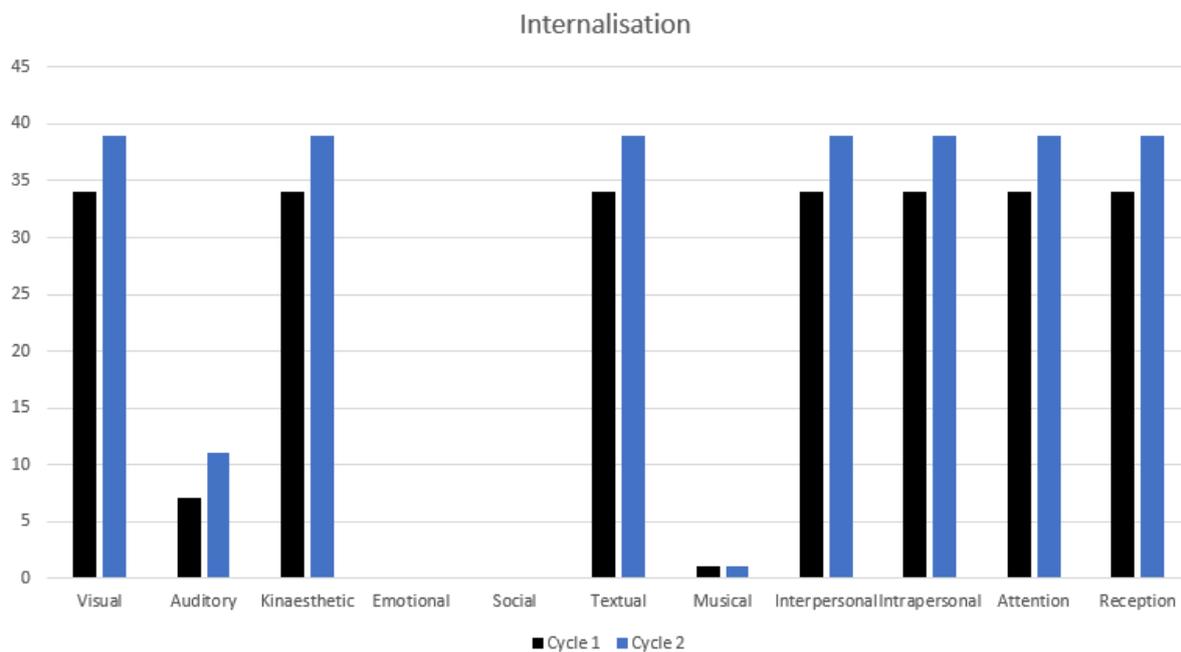
Figure 6.10: Sensory stimuli (cycle 1 versus cycle 2)

Secondly, in terms of externalisation (see Figure 6.11), in the CSCL implementation phase when students started working on Google Slides, students were able to use different motor stimuli for completing the activities. For example, the software enabled them to use the following motor stimuli: 1) writing in the form of adding text through the keyboard; 2) reporting in the form of adding voice comments on a video to act as a journal reporter; 3) speaking through inserting sound and/or video files that included students' voices; 4) completing through completing missing parts in a sentence either by inserting text or moving objects on screen; 5) moving through dragging and dropping shapes, pictures, and/or text boxes; 6) drawing through inserting shapes and pictures; and 7) presenting in the form of presenting students' answers in class as the software has a feature that allows all contributing members to access each other's work at the same time and add, edit, and/or delete in anyone's content through the "share" button.

Writing

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	8	3	3	5	1	3	1	2	1	2	2	7	3	0	6	2	2	0	5	2	3

Reporting

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Speaking

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
0	0	0	1	0	0	0	1	0	0	0	1	0	0	3	1	0	0	2	0	0	0

Completing

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
0	7	0	0	1	2	0	0	0	1	0	0	3	0	0	2	1	0	0	0	0	1

Moving

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
0	5	0	0	0	2	0	0	0	0	0	0	3	0	0	2	1	0	1	0	0	0

Drawing

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Presenting

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	11	3	3	5	2	3	1	2	1	2	3	8	3	3	6	2	2	2	5	2	3

Figure 6.11: Motor stimuli used and not used by participants with their students

In addition, Figure 6.12 shows a bar chart that compares the total number of times each stimulus was used in cycles 1 and 2.
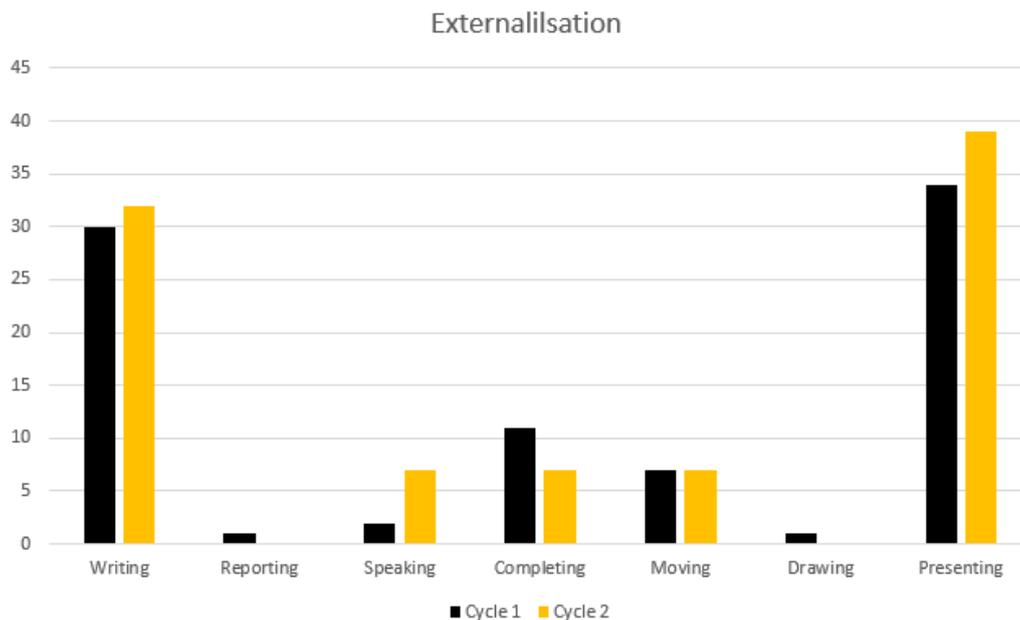
Figure 6.12: Motor stimuli (cycle 1 versus cycle 2)

Thirdly, in terms of internal cognitive processing that target ICT knowledge (refer to Figure 6.13), students in the implementation phase were able to gain ICT skills and understanding (e.g. students were able to type in Arabic and use the different features of Google Slides such as insert (text, picture, video, text) and access/correct each other's work).

Gain skill

Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	11	3	3	5	2	3	1	2	1	2	3	8	3	3	6	2	2	2	5	2	3

Gain understanding

Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	11	3	3	5	2	3	1	2	1	2	3	8	3	3	6	2	2	2	5	2	3

Figure 6.13: ICT learning involved in student-based activities

In addition, Figure 6.14 shows a bar chart that compares the total number of times each learning element was used in cycles 1 and 2.
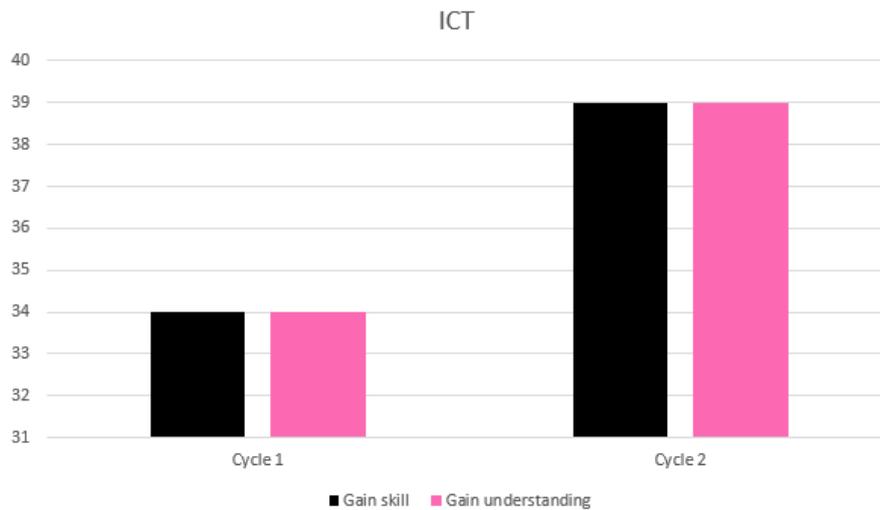
Figure 6.14: ICT (cycle 1 versus cycle 2)

In terms of internal cognitive processing that target subject knowledge (see Figure 6.15), participants added questions that directed students to: 1) search in the material (reading text, vocabulary, video) to extract answers for certain questions; 2) generate ideas related to a certain video with no sound or a picture; and 3) imagine what is being said in a conversation between two or more people or to imagine an ending for a certain story.

Searching

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	10	3	1	5	2	3	0	2	1	2	1	8	3	1	5	1	2	2	5	1	3

Generating ideas

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
0	0	1	1	0	0	0	1	0	0	1	0	0	1	2	1	0	0	2	0	0	1

Hypothesising

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Imagining

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
0	0	0	1	0	0	0	1	0	0	1	1	0	1	2	0	0	0	2	0	0	1

Figure 6.15: Subject knowledge developed through student-based activities

In addition, Figure 6.16 shows a bar chart that compares the total number of times each learning element was used in cycles 1 and 2.
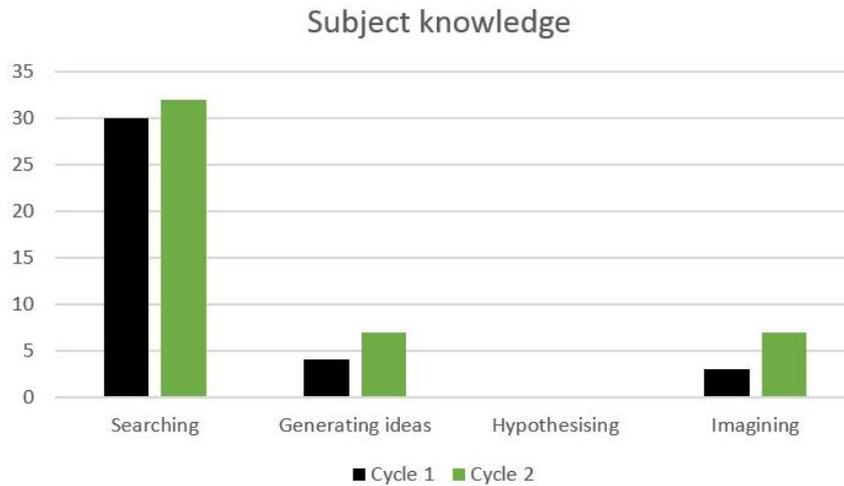
Figure 6.16: Subject knowledge (cycle 1 versus cycle 2)

In terms of internal cognitive processing that target thinking skills (see Figure 6.17), participants developed activities that used different thinking learning elements. For example: 1) creativity in the form of making up and narrating a dialogue between animals in a story; 2) questioning and interpreting in the form of understanding the questions and being able to answer them; 3) comparing in the form of asking students to correct each other's work by finding similarities and differences and/or comparing reading texts to extract the differences and analyse the content; and 4) reasoning through answering questions that needed to show evidence extracted from the text to back up students' opinions.

Creativity

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
0	0	1	1	0	0	0	1	0	0	1	1	0	1	2	1	0	0	2	0	0	1

Enquiring

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Questioning

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	11	3	3	5	2	3	1	2	1	2	3	8	3	3	6	2	2	2	5	2	3

Interpreting

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	11	3	3	5	2	3	1	2	1	2	3	8	3	3	6	2	2	2	5	2	3

Conceptualising

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comparing

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0

Reasoning

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
0	2	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	1	0	0

Concept formation

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Reconstruction of ideas

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Figure 6.17: Thinking involved in student-based activities

In addition, Figure 6.18 shows a bar chart that compares the total number of times each learning element was used in cycles 1 and 2.
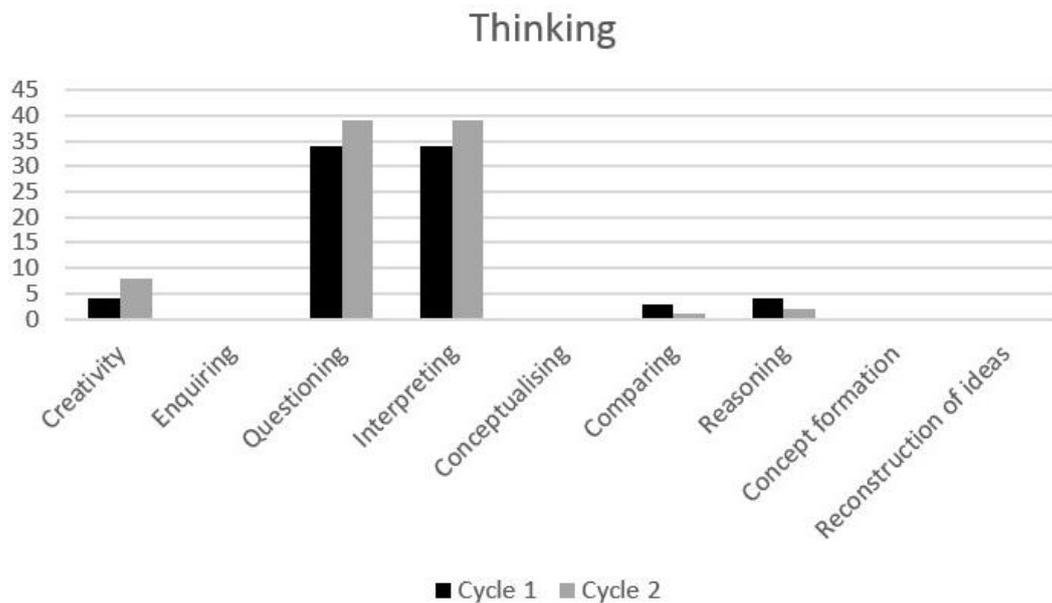
Thinking

Figure 6.18: Thinking (cycle 1 versus cycle 2)

In terms of internal cognitive processing that target knowledge handling (see Figure 6.19),
teachers developed activities that enabled students to: 1) acquire and comprehend knowledge
trough the different sensory stimulus routes; 2) apply in the form of answering questions that
reflected their learning; 3) analyse reading, audio, and/or video text to answer questions on
them; 4) synthesise in the form of adding a summary for a reading or a video text; and 5)
evaluation through asking students to evaluate each other's work.

Acquisition

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	11	3	3	5	2	3	1	2	1	2	3	8	3	3	6	2	2	2	5	2	3

Comprehension

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	11	3	3	5	2	3	1	2	1	2	3	8	3	3	6	2	2	2	5	2	3

Application

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	11	3	3	5	2	3	1	2	1	2	3	8	3	3	6	2	2	2	5	2	3

Analysis

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	3	3	3	4	0	3	0	2	0	2	3	3	3	3	3	0	2	0	5	0	2

Synthesis

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	3	3	3	4	0	3	0	2	0	2	3	3	3	3	3	0	2	0	5	0	2

Evaluation

	Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	11	3	3	5	2	3	1	2	1	2	3	8	3	3	6	2	2	2	5	2	3

Figure 6.19: Knowledge handling involved in student-based activities

In addition, Figure 6.20 shows a bar chart that compares the total number of times each learning element was used in cycles 1 and 2.
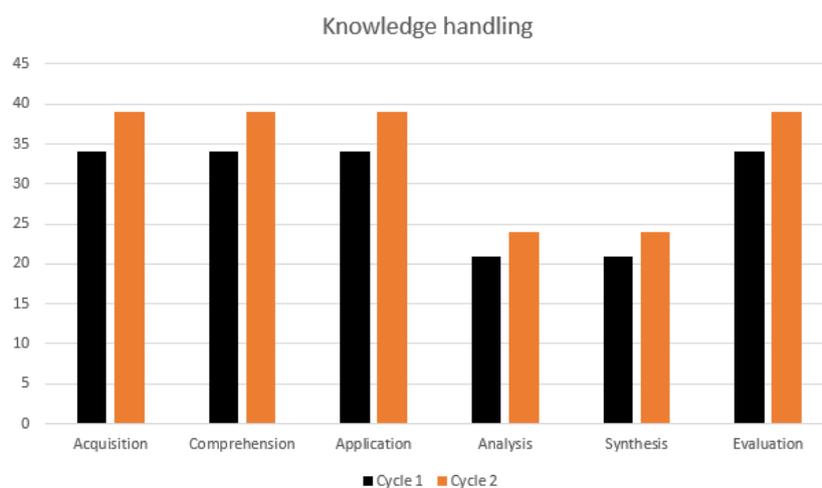

Figure 6.20: Knowledge handling (cycle 1 versus cycle 2)

In terms of internal cognitive processing that target memory (see Figure 6.21), the CSCL activities offered opportunities for memorisation in the form of retrieve, rehearse, and recall of data as the CSCL activities were online and could always be accessed by students anytime and anywhere. In addition, they could be downloaded in different formats to be accessed offline and printed in a hard copy format. As a result, the tool (Google Slides) itself offered opportunities for memorisation but that was not the focus of the activities.

Retention

Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	11	3	3	5	2	3	1	2	1	2	3	8	3	3	6	2	2	2	5	2	3

Rehearsal

Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	11	3	3	5	2	3	1	2	1	2	3	8	3	3	6	2	2	2	5	2	3

Retrieval

Cycle 1											Cycle 2										
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
1	11	3	3	5	2	3	1	2	1	2	3	8	3	3	6	2	2	2	5	2	3

Figure 6.21: Memory involvement with student-based activities

In addition, Figure 6.22 shows a bar chart that compares the total number of times each learning element was used in cycles 1 and 2.
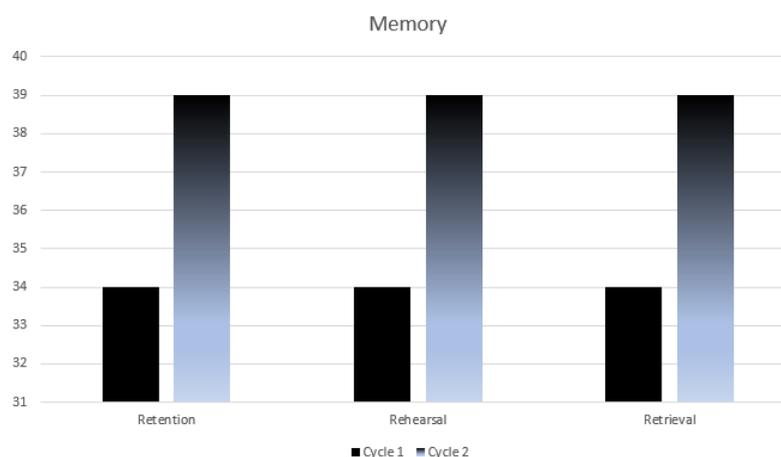

Figure 6.22: Memory (cycle 1 versus cycle 2)

Moreover, Figure 6.23 shows the total number of times each learning element was used in cycle 1 versus cycle 2 in addition to the total number of times each was used in both cycles

(e.g. the visual stimulus was used by participants 34 times in cycle 1 and 39 times in cycle 2 making a total of 73 times in both cycles).

No	Learning elements	Cycle 1	Cycle 2	Total
1.	Visual	34	39	73
2.	Auditory	7	12	19
3.	Kinaesthetic	34	39	73
4.	Emotional	0	0	0
5.	Social	0	0	0
6.	Textual	34	39	73
7.	Musical	1	1	2
8.	Interpersonal	34	39	73
9.	Intrapersonal	34	39	73
10.	Attention	34	39	73
11.	Reception	34	39	73
12.	Gain skill	34	39	73
13.	Gain understanding	34	39	73
14.	Retention	34	39	73
15.	Rehearsal	34	39	73
16.	Retrieval	34	39	73
17.	Writing	30	32	62
18.	Reporting	1	0	1
19.	Speaking	2	7	9
20.	Completing	11	7	18
21.	Moving	7	7	14
22.	Drawing	1	0	1
23.	Presenting	34	39	73
24.	Searching	30	32	62
25.	Generating ideas	4	7	11
26.	Hypothesising	0	0	0
27.	Imagining	3	7	10
28.	Creativity	4	8	12
29.	Enquiring	0	0	0
30.	Questioning	34	39	73
31.	Interpreting	34	39	73
32.	Conceptualising	0	0	0
33.	Comparing	3	1	4
34.	Reasoning	4	2	6
35.	Concept formation	0	0	0
36.	Reconstruction of ideas	0	0	0
37.	Acquisition	34	39	73
38.	Comprehension	34	39	73
39.	Application	34	39	73
40.	Analysis	21	24	45
41.	Synthesis	21	24	45
42.	Evaluation	34	39	73

Figure 6.23: All learning elements (cycle 1 versus cycle 2)

Finally, Figure 6.24 shows the total number of times each learning element was used in the two cycles by highlighting whether the rate was high, medium, or low. The horizontal axis

includes all the 42 learning elements (refer to Figure 6.23 to match the number with the position from left to right) and the vertical axis shows the number of times each learning element was used. For example, learning element 17 (Writing, refer to Figure 6.23) was used 62 times.
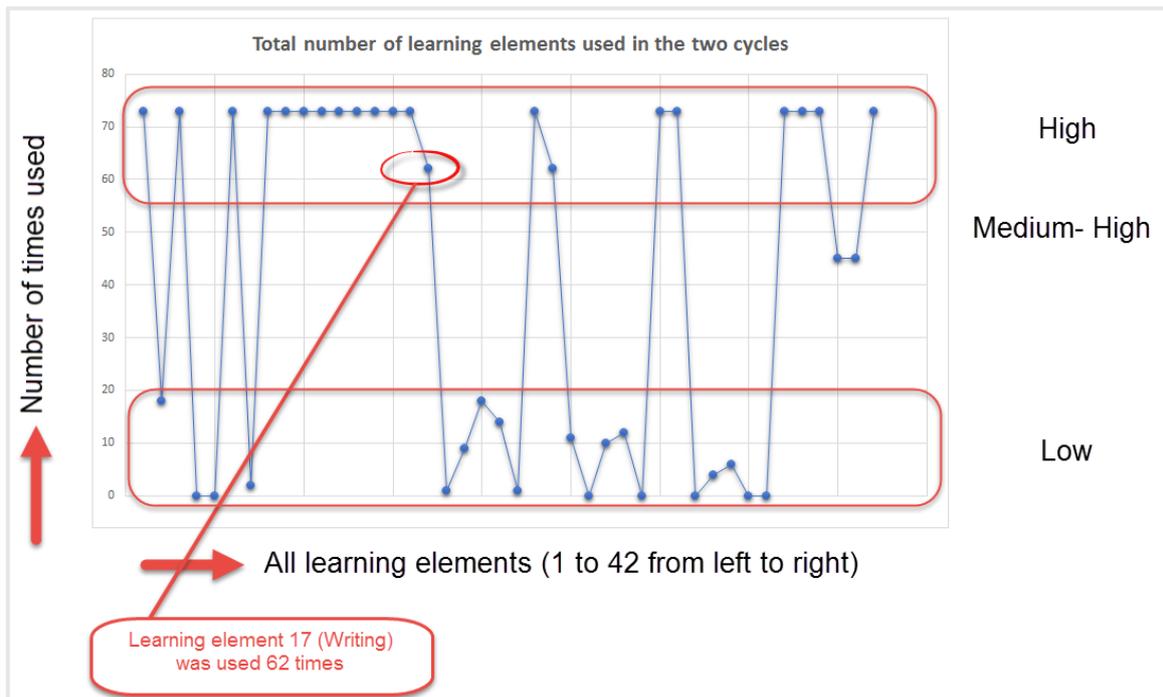

Figure 6.24: High, medium, and low use of learning elements in both cycles

Having highlighted teachers' response in terms of the CSCL designed, developed, and implemented, the next sub-section focuses on teachers' response in terms of the exchanged feedback/comments among each other in the collaborative medium (Blackboard). In addition, it is worth highlighting here that the results of this sub-section are discussed in the next chapter in sub-section 7.4.1.

6.4.2- Feedback/comments

Figure 6.25 shows the total number of CSCL activities designed, developed, and implemented by each teacher in addition to the number of feedback/comments received and given. This is represented in the form of a node that has different sticks (referring to the activities), looking-

up arrows (referring to the received feedback/comments), looking-down arrows (referring to the feedback/comments given per activity), and a number above to show the total number of activities produced (e.g. P(5) has developed 11 activities and gave 5 feedback/comments and received 3 feedback/comments).
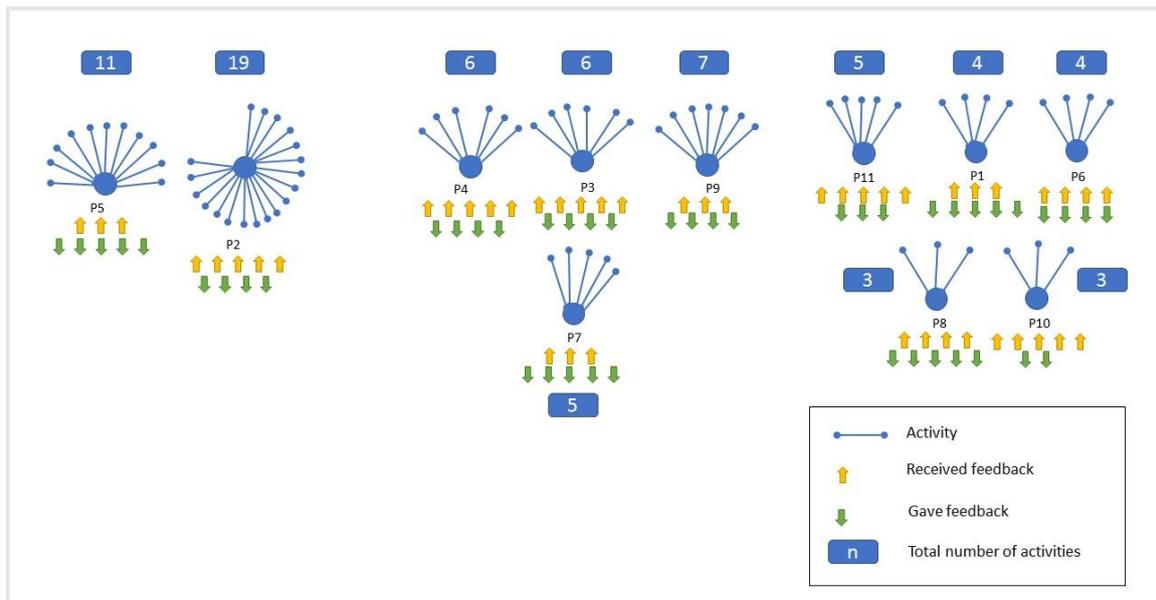

Figure 6.25: CSCL activities and feedback/comments

Figure 6.26 shows the number of received feedback/comments per activity for each teacher represented in the form of a blue rectangle (activities that received feedback/comments), an orange rectangle (activities that did not receive any feedback/comments), a number in the orange rectangle (total number of feedback/comments received), and bracelets with a number (total number of activities in general).

For example, P(1) designed, developed and implemented 4 CSCL activities and received 2 feedback/comments on one activity and 1 feedback/comment on another activity leaving two activities without feedback/comments.
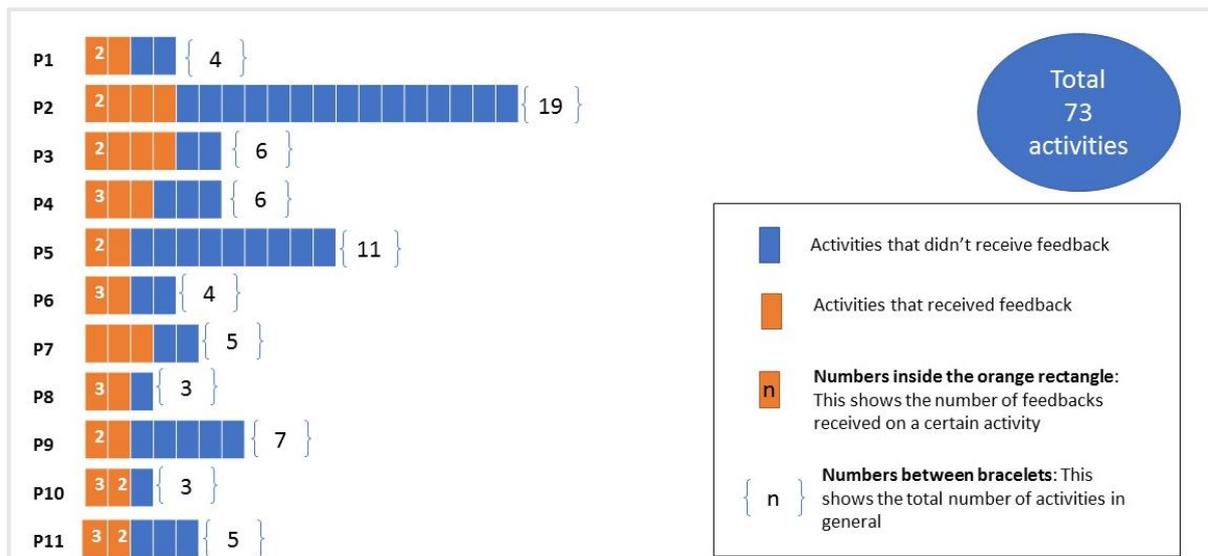
Figure 6.26: Feedback/comments received for each activity

Figure 6.27 shows a matrix that can be read both horizontally and vertically. Horizontally, it shows the relationship between feedback/comments received by each participant with respect to other participants in addition to the total number of feedback/comments received. For example, P(1) received 2 feedback/comments from P(4) (2 green balls) and 1 feedback/comments from P(11) (1 brown ball) making a total number of 3 feedback/comments received. However, vertically, it shows the relationship between comments given by each participant with respect to other participants in addition to the total number of feedback/comments given. For example, P(1) gave 2 feedback/comments to P(2) (blue balls), 2 feedback/comments to P(4) (blue balls), and 1 feedback/comment to P(11) (blue ball) making a total number of 5 feedback/comments given.
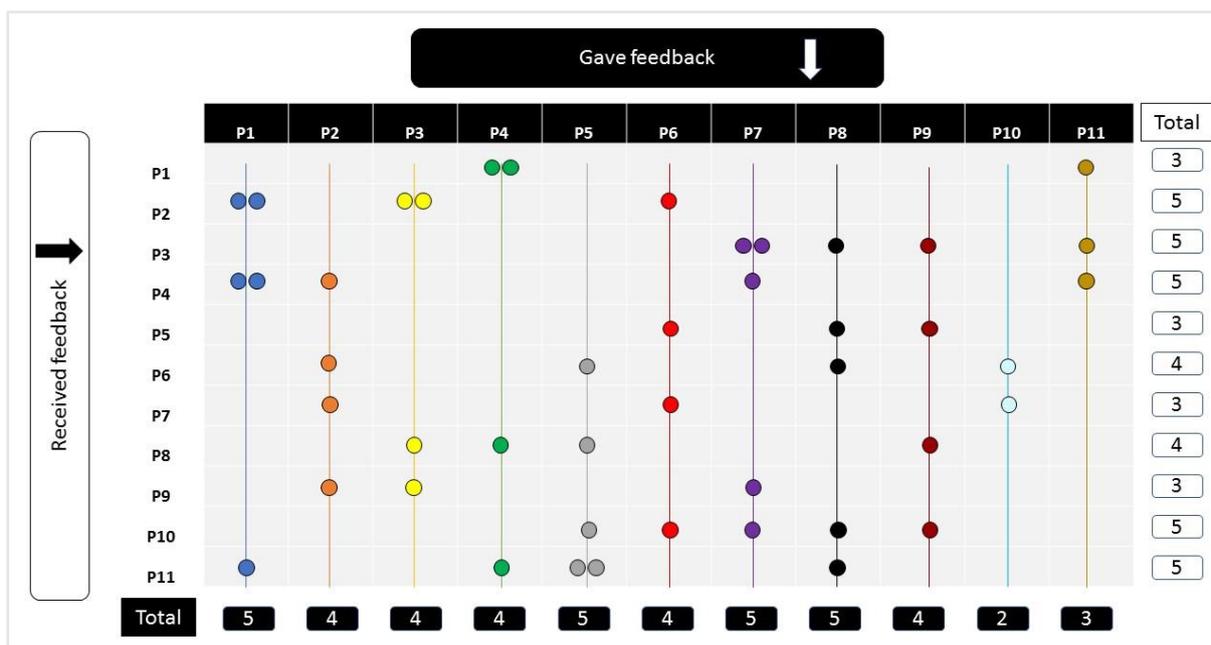
Figure 6.27: Feedback/comments matrix

In addition to the above visual analysis, it is worth highlighting here that the duration of the video-recorded feedback/comments exchanged among teachers was between 38 seconds minimum to 6 minutes and 38 seconds maximum and the focus of the feedback/comments was either on: 1) the design of the activity layout on Google Slides; 2) the pedagogy behind the activity; and/or 3) the enhancements that could be done on the activity.

From observing and translating the videos, some excerpts are highlighted here to reflect on the types of feedback/comments. For example, regarding the design of the layout, P(7) commented on P(10)'s activity and said: "I just want to comment on the layout of the page. Why did you add the vocabulary that way? My suggestion is to put the box directly after the word." Regarding the suggestions for enhancing the activity, P(4) commented on P(1)'s activity and said: "What if you can put the new vocabulary and expressions in another slide?" and P(5) commented on P(8) and said: "I am trying to find suggestions but I cannot because I want to see students' answers. Waiting for students' production and from here we can say what needs more work to be done." Regarding the pedagogical feedback, P(8) commented on

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P(3)'s activity and said: "The first thing that I liked is that it did not depend on comprehension only, but you used comparison."

Having highlighted teachers' response in terms of the feedback/comments exchanged among each other in the collaborative medium, the next sub-section focuses on teachers' response in terms of the video-recorded reflections uploaded on Blackboard and shared among each other. In addition, it is worth highlighting here that the results of this sub-section are discussed in the next chapter in sub-section 7.4.2.

6.4.3- Teachers' reflections

Figure 6.28 shows the number of: 1) shared activities with reflections (blue balls); 2) shared activities with no reflections (grey balls); 3) unshared activities (white balls); and 4) total number of shared activities versus the total number of activities in general (bracelets with two numbers). For example, P(1) shared 4 out of 4 activities with video on-screen reflections, while P(2) shared 8 out of 19 activities, but without video on-screen reflections. Figure 6.28 also shows that there are 40 shared activities with reflections, 8 shared activities with no reflections, and 25 unshared activities out of a total of 73 activities.
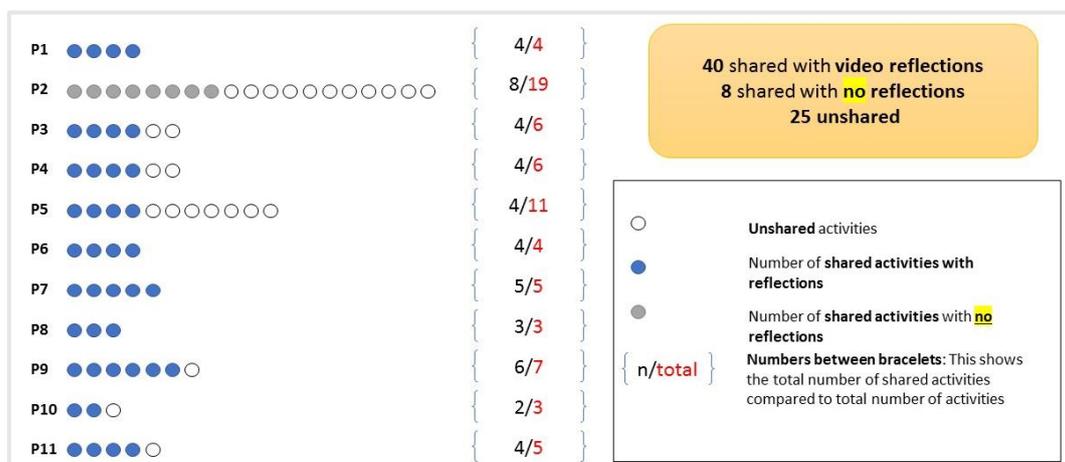

Figure 6.28: Reflections

It is worth highlighting also that the video on-screen reflections lasted between 1 minute minimum to 8 minutes maximum and all of them were shared after the implementation phase except for: 1) P(8) who shared the same activity once after the development phase and once after the implementation phase; and 2) P(2) who shared her activities in the form of Google slide files without on-screen video reflections and after the development phase.

Regarding the reflections, teachers in the on-screen videos talked about: 1) the pedagogical objectives; 2) how students responded; and 3) how they perceived the activity after implementing it. From observing and translating the videos, some excerpts are highlighted to reflect the types of responses. For example, regarding the pedagogical objective of the activities, P(11) said: "This activity is like a puzzle since each student was assigned certain questions unlike the others and when they saw each other's answer, they can see the big picture." Regarding how students responded to the activities, P(7) said: "The students are totally resisting the use of computer for writing Arabic" and P(3) said: "I asked them about their feedback and they were happy because the layout is more organised; it gives them the opportunity to review each other's work; happy to type in Arabic although I was afraid of that. Their feedback was positive." Regarding how teachers perceived the activities after implementing them, P(5) said: "One of the benefits of this activity while designing it through Google Slides is that students will have this activity with them even after the semester ends."

Having highlighted teachers' responses in terms of the shared video-recorded reflections, the next section focuses on students' responses towards the CSCL activities, but from teachers' perspectives. In addition, it is worth highlighting here that the results of this sub-section are discussed in the next chapter in sub-section 7.4.3.

6.5- Sub-RQ5: What are students' responses towards the TEL activities from teachers' perspectives?

On the one hand, teachers reported positive learning outcomes that students were able to achieve such as being able to: 1) collaborate to finish a certain task; 2) learn to learn Arabic in a creative way; 3) learn from each other; 4) understand the material more; 5) type in Arabic; 6) think more deeply and analytically; 7) collaborate in a fun and friendly environment; 8) share, write, and record their work; 9) discuss and correct each other's work; 10) remember concepts; and 11) read each other's comments. For example, among the comments cited were those by P(1) who said: "Learn to learn Arabic in more creative way, learn to collaborate while finishing the task together"; P(2) commented: "Learn from each other, Understand the text more, see each other's answers, Go through the text over and over again"; P(3) who recalled: "Creativity, collaborate, write in Arabic, think more deeply, think analytically"; and in the same vein P(4) said: "Collaborate in a fun environment, warm, friendly, collaborate, cooperate"; and finally P(5) conveyed the same opinion and said: "Learn to participate, share, write, record, and speak."

On the other hand, three teachers reported that students reacted negatively such as feeling bored, not interested, not motivated, and/or distracted by their mobile telephones. In this regard, P(4) said: "Lazy, bored all the time, just want to pass"; P(7) commented: "Did not learn because they were not interested, not motivated to learn Arabic, technology did not make a difference, texting on the mobile and complaining"; and P(11) recalled: "Not as enthusiastic as expected in the first 2 activities and then very positive and enthusiastically participated."

Having said that, it is worth highlighting here that the results of this sub-section are discussed in the next chapter in section 7.5.

6.6- Summary

In this chapter, the focus was on presenting the results of the first five sub-research questions using both text and visual representations, and multi-layered analysis of data to give a clear understanding of the results. The next chapter focuses on discussing the findings of each sub-research question and relating that to the literature in addition to answering the sixth sub-research question that target the design principles of a successful implementation of a PDP.

Chapter 7: Discussion of findings

The purpose of this DBR study was to enable teachers to design, develop, and implement CSCL activities for teaching AFL through a PDP that was designed in reference to Laurillard's (2002) conversational framework and Passey's (2011) learning elements framework. The results presented in the previous chapter highlighted: 1) teachers' perceptions (related to Sub-RQ1); 2) teachers' pedagogical outcomes in relation to the different types of support provided (related to Sub-RQ2); 3) the positive influencers and barriers that affect teachers throughout the PDP (related to Sub-RQ3); 4) teachers' responses to the PDP (related to Sub-RQ4); and 5) students' responses towards the TEL activities from teachers' perspectives (related to Su-RQ5). This chapter focuses on discussing the findings, based on the results presented in the previous chapter, in addition to presenting the findings of Sub-RQ6 that are concerned with the design principles of an effective implementation of a PDP.

7.1- Findings of Sub-RQ1 (How did teachers perceive the PDP?)

7.1.1- **Finding 1 (Researcher/facilitator support):** All teachers perceived the researcher/facilitator support that is aligned with the TCC and TPC cycles in Laurillard's (2002) conversational framework positively, for different reasons, related to facilitator support, leadership style, and coaching.

Firstly, teachers acknowledged the values of researchers/facilitator support using words such as: "providing ideas", "providing manuals and exemplary materials", "providing instant feedback", "giving support to students", "available whenever needed", "following up", and "providing one-to-one sessions". Having said that, this aligns with the learning design literature that highlighted the importance of having a facilitator for: 1) guidance (Kafyulilo et al., 2015); 2) face-to-face meetings (Voogt et al., 2005); 3) content, pedagogy, and technology

(Alayyar et al., 2012); 4) just in-time support while applying knowledge and skills to practice (Kafyulilo et al., 2015); and 5) following up (Huizinga et al., 2014).

Secondly, teachers showed a positive attitude towards the researcher/facilitator's transformational leadership style by using words such as "patient" and "encouraging". This aligns with the organisational learning literature, which highlights that leadership style affects learning in an organisation (Bhat et al., 2012). In addition, they acknowledged the researcher/facilitator coaching positively throughout the PDP by using words such as "assessing needs", "explaining tasks clearly", "providing an online space for accessing all the PDP resources", and "having fixed allocated one-to-one sessions for meeting weekly". This aligns with the recommendations of: 1) Sadaf et al. (2016) who said that contextualising learning affects teachers' use of technology positively; and 2) Kyndt et al. (2016) who referred to coaching as one of the elements that enhances learning in an organisation.

In addition, teachers responded positively to the tasks given to them by the researcher/facilitator throughout the PDP, which might have been enhanced because the researcher/facilitator: 1) was an insider; 2) knew the context well; and 3) was experienced in teaching the same content they were teaching. That enabled them to trust her, as they were familiar with her knowledge (content, technology, and pedagogy), personality, and expertise. Therefore, they did not feel tensioned, but to the contrary seemed to feel comfortable and willing to cooperate with the facilitator to achieve the PDP objective.

Based on the above, it can be concluded that the researcher/facilitator support, offered through an appropriate leadership style and coaching (as discussed and detailed by Bhat et al. (2012) and Kyndt et al. (2016) in sub-sections 2.2.1.2 and 2.2.1.8) enabled teachers to design, develop, and implement the CSCL activities throughout the two cycles of the PDP. This is

expected to help in the design of any further PDP developed by others as this finding might indicate the need for a prior relationship between the facilitator and the trainees to ensure that the PDP is successful.

7.1.2- **Finding 2 (exemplary materials and templates with sound explanation):** Most teachers perceived the exemplary materials and templates with sound narration that are aligned with the TMC cycle in Laurillard's (2002) conversational framework and the internalisation and externalisation learning elements in Passey's (2011) learning elements framework positively. The reasons behind these positive perceptions were related to the benefits gained from, and the embedded features of, the exemplary materials such as: including authentic material; providing different design ideas; including students' responses; enabling the re-use of already designed and developed activities; explaining the pedagogical objective behind using the template; showing how technology is used in real life; and acting as a bank of activities where they can be adjusted for re-use again.

This finding aligns with the learning design literature in terms of how exemplary materials: 1) gives a clear picture of what is supposed to be produced (Kafyulilo et al., 2015); 2) motivates teachers throughout the design process by enabling tailoring for their needs (Kali et al., 2015); and 3) enables them to observe the benefits and outcomes of technology by themselves (Uluyol & Sahin, 2016).

As a result, it can be deduced that the exemplary materials are considered an enabling type of support that motivated the learning process throughout the two cycles of the PDP. Another interpretation that could also be included here is that the researcher/facilitator has convinced the teachers to use the exemplary materials because she herself had already used this material

in real classrooms; so, they might have felt confident using the exemplary materials and that motivated them to tailor them for their course objectives. Accordingly, just providing them with exemplary materials might not be the sole reason behind using them but having the researcher/facilitator who is already a teacher herself designing and developing those exemplary materials might be a main motivator.

7.1.3- **Finding 3 (video manuals):** Most teachers perceived the video manuals positively, which were used in all cycles of Laurillard's (2002) conversational framework, for different reasons: using them as reference, following visually supported instructions; saving their time compared to reading manuals; remembering instructions; and including detailed step-by-step instructions. The objections regarding the manuals were not including sound and being long in the first cycle of the PDP and feeling overstressed when left to use them independently.

This finding aligns with Xie and Bugg (2009), who recommended providing learners with video manuals tailored by the instructor with clear detailed instructions to guide them throughout the training sessions. This recommendation holds true in this context, since most teachers found the video manuals useful because they enabled them to follow the instructions and design the activities. In addition, their suggestions for enhancing them further (e.g. adding sound and decreasing the length of the videos) were taken into consideration in cycle 2. As a result, we can conclude that manuals can be used as a useful type of support for enabling and motivating teachers throughout the PDP, but they should be aligned with learners' needs to make them beneficial.

7.1.4- **Finding 4 (feedback/comments):** Most teachers perceived colleagues' feedback/comments in the collaborative medium (Blackboard) positively, which aligns with the PCC and PMC cycles in Laurillard's (2002) conversational framework, as they were able to: enhance their designs; see others' different perspectives; encourage each other; receive constructive feedback in a safe environment; and exchange ideas. However, the feedback/comments were not found useful by others because of: lack of time to communicate; being able to reach the objective of the PDP without the feedback; and feeling embarrassed to share real feedback with colleagues.

Firstly, this finding aligns with the learning design and organisational learning literature that highlights the importance of providing collaborative support for learning. For example: 1) Kafyulilo at al. (2015) mentioned that supporting teachers through providing a collaborative medium leverages their technology integration; 2) Schumacher (2015) said that collaboration enhances interactional skills since learners can share experiences and knowledge for learning; and 3) Bhaskar and Mishra (2014) reported that learning happens in collaborative environments through sharing different perspectives. In addition: 1) Bhat et al. (2012) highlighted the importance of having a collaborative culture for facilitating the learning process; 2) Cho et al. (2013) also mentioned the importance of culture as a catalyst for organisational learning when it embraces the value of trust, belonging, and family-like relationships; and 3) Pantouvakis and Bouranta (2017) stated the importance of transferring knowledge in an organisational culture that fosters learning as a team.

Secondly, this finding aligns with the learning design and organisational learning literature in terms of the importance of exchanging feedback between learners for enhancing learning. For

example, feedback was found useful because it had cognitive functions that provided information about the adequacy of one's knowledge and motivational functions that shows people whether they met the expectations or not (Knipfer et al., 2013; Kyndt et al., 2016). The same point was also advocated by Bhaskar and Mishra (2014) when they referred to constructive feedback as a catalyst for motivating the process of organisational learning.

Accordingly, we can recognise in this instance that constructive feedback/comments are useful types of support that motivate the learning process. However, it is worth mentioning that teachers might have perceived the feedback/comments as useful and constructive because they already knew their colleagues very well and felt comfortable since they had worked together between 10 to 30 years. As a result, they knew each other's teaching approaches very well and that might have been why sharing experiences through providing feedback/comments helped them enhance the activities further and motivated the learning process.

However, for the one who did not feel comfortable about giving honest feedback/comments to her colleagues, that might be related to an Eastern culture, as sometimes giving honest feedback to others might be perceived to be impolite, especially if there is a difference in age and/or power. In addition, for the participant who said that she could reach the PDP objective without collaborating with her colleagues, that might have been because of her personality characteristics or the 'old learning culture' that did not encourage learning in a collaborative environment; so, collaboration for them was perceived as not being useful. Finally, for the participant who said that she had a limited time to listen to her colleagues' feedback, that might be because of her excessive administrative workload and if she had time, she might have listened to her colleagues' feedback. However, it is worth mentioning that limited time might always be a barrier (Chien et al., 2015) for learning if: 1) teachers do not allocate time

for learning, and/or 2) the organisation does not allow teachers to have time for learning something new.

7.1.5- **Finding 5 (reflections):** All teachers perceived the exchanged on-screen video-recorded reflections in the collaborative medium (Blackboard) positively, which is aligned with the PCC and PMC cycles in Laurillard's (2002) framework for different reasons, such as: communicating with colleagues online; learning a new technology for sharing on-screen video reflections; reflecting on the strengths and weaknesses of the designed activities; being able to view each other's class work online; learning from each other; and gaining knowledge about students' different responses on activities.

This finding aligns with the learning design and organisational learning literature. For example, Kyndt at al. (2016) highlighted the importance of reflection as a driving force for learning among members in an organisation. In addition, it was perceived helpful because it helped teachers to learn from each other and from their practices (Kafyulilo et al., 2016). As a result, we can see that reflection was considered one of the support elements that enabled teachers' learning throughout the PDP.

7.1.6- **Finding 6 (responding to teachers' questions):** All teachers perceived the feature included in the second cycle of the PDP for responding back to teachers' questions online in the collaborative medium (Blackboard) positively, which is aligned with the PCC cycle in Laurillard's (2002) framework, because it enabled them to open discussions with their colleagues to clarify unclear points and express their points of view.

This finding aligns with the learning design literature where Svihla et al. (2015) supported teachers in the design of TEL activities through supporting dialogue, leading to better learning. As a result, we can see that providing an online medium for supporting dialogue among participants for responding to each other's questions motivated the learning process because it opens for them a free space for discussion whenever and wherever needed.

7.1.7- **Finding 7 (CSCL):** Most teachers perceived the CSCL positively because it enabled students to: share cultural awareness; share and build knowledge; solve problems individually and collaboratively. In addition, it increased students' engagement and therefore enhanced class time because students were: focusing on the task; giving feedback to each other; and following on each other's work in a 'fun' environment among students. However, there were reasons for perceiving CSCL as unsuccessful with students, because of their negative attitudes towards typing in Arabic and being distracted by their mobile telephones.

This finding aligns with the benefits of CSCL highlighted in the literature, such as: 1) enabling learners to share and build knowledge in a collaborative environment using digital technology tools (Jones, 2015); and 2) sharing knowledge through discussions and reflections (Hartley, 2010).

Accordingly, we can see that CSCL can enhance language learning in this collaborative environment, but due to other reasons related to students' negative attitudes and/or responses towards the use of technology for learning, they might not become engaged positively with these kinds of activities.

7.1.8- **Finding 8 (Google Slides):** All teachers perceived Google Slides as a tool for designing and developing CSCL activities positively because it enabled students to work collaboratively, individually, and inside and outside the class boundaries. In addition, through its features, teachers were able to: 1) add pictures, videos, and audio files easily; 2) edit content; 3) change font-size and colour; 4) share activity with students; and 5) correct students' mistakes instantly. They also acknowledged that it could be used with different language skills and it supported the Arabic language. Among the features they also favoured were: 1) including an auto-save feature; 2) having a user-friendly interface that looks like MS PowerPoint; 3) being accessed anywhere; and 4) using it as a tool for visualising the design of the activity. However, one of the drawbacks that was encountered in Google Slides was having a short slide length.

This finding aligns with the literature in terms of technology affordances, which were highlighted by Järvelä et al. (2015) who talked about how the properties of an object can affect its usage. Accordingly, we can see that it is the affordances of the technology that can encourage or discourage uses for meeting objectives. In addition, this finding aligns with Agyei and Voogt (2012) who recommended the use of an available user-friendly tool for enabling teachers to integrate technology in their classroom practice.

This finding shows that teachers acknowledged the different features of Google Slides that enabled them to design, develop, and implement CSCL activities. In addition, it shows that having a user interface that looks like a frequently-used tool might motivate its use and for that reason, teachers might have been encouraged to use Google Slides since it looks very similar to MS PowerPoint.

7.2- Findings of Sub-RQ2 (What types of pedagogic outcomes are produced and how do they relate to the ways that teachers used different forms of support?**)**

Sub-RQ2 sought to identify the types of pedagogic outcomes produced and how they related to the ways that teachers used different forms of support.

From the literature review, it was found that there was a gap concerning which learning conditions could lead to which learning outcomes (Kyndt et al., 2016). As a result, this sub-research question attempted to fill this gap by highlighting the learning outcomes that teachers produced as a result of providing different types of support. It is important to highlight that although learning conditions (support elements) might be available, it is the choice of the learner to decide if s/he will use these learning opportunities or not (Tynjälä, 2008, as cited in Kyndt et al., 2016). Accordingly, the participants in this PDP chose to use the different types of support provided by the researcher/facilitator when producing certain learning outcomes.

The organisational learning literature classified learning outcomes as follows: 1) knowledge gain (e.g. Alegre et al., 2012); 2) organisational action (e.g. Cho et al., 2013); and 3) application (e.g. Walker, 2016). Accordingly, in alignment with this literature, the learning outcomes identified from this study (represented as O(n) where n is from 1 to 24) are listed under three types of learning outcomes (represented as C(n) where n is from 1 to 3):

1. **Knowledge gain (C1)** such as: gaining ideas (O1); understanding the process (O2); knowing the benefits and limitations of Google Slides (O3); knowing how to use Google Slides in different ways (O4); knowing the potential of CSCL (O5); understanding how the activities are designed (O6); and knowing the pedagogical objective of Google slide templates (O7).

2. **Organisational action and application (C2)** such as: implementing ideas (O8);

    designing, developing, and implementing CSCL activities (O9); imitating templates with

    new material (O10); uploading activities (O11); getting exposed to others' work (O12);

    sharing experiences and reflections on activities (O13); improving activities (O14);

    sending/receiving/listening to/and sharing feedback (O15); using some learning elements

    in designing the CSCL activities (O16); using manuals for guidance (O17); respond to

    colleagues' questions and comments (O18); and solving technical problems (O19).

3. **Change in attitudes (C3)** such as: thinking critically (O20); thinking aloud (O21); reflect

    on old teaching techniques (O22); think of innovative techniques to change classroom

    atmosphere (O23); and being independent (O24).

Having highlighted that, Figure 7.1 shows the relationship between the support elements

provided and the pedagogical outcomes in addition to the type each learning outcome belongs

to. The support elements are represented as S(n) where n is from 1 to 4 (researcher/facilitator

support (S1), manuals (S2), collaborative medium (S3), and exemplary materials (S4)).

Figure 7.1: Relationship between support elements, pedagogical outcomes, and types of learning outcomes

C1	C2	C3	Outcome	S1	S2	S3	S4	Total
*			O1	●	●		●	3
*			O2	●	●			2
*			O3	●				1
*			O4	●	●		●	3
*			O5	●	●	●	●	4
*			O6		●		●	2
*			O7		●		●	2
	*		O8	●	●		●	3
	*		O9	●	●	●	●	4
	*		O10				●	1
	*		O11			●		1
	*		O12			●		1
	*		O13			●		1
	*		O14			●		1
	*		O15			●		1
	*		O16		●			1
	*		O17		●			1
	*		O18			●		1
	*		O19		●			1
		*	O20			●		1
		*	O21			●		1
		*	O22		●			1
		*	O23				●	1
		*	O24		●		●	2
7	12	5		7	13	10	10	

Figure 7.1 shows that organisational action and application (C2, produced 12 times) was the highest type of outcome produced, followed by knowledge gain (C1, produced 7 times), and change in attitude (C3, produced 5 times). This might show that teachers were able to take actions and apply what they learned and not only gain knowledge without practice. In addition, it shows that their attitudes towards the use of technology in teaching was changed as a result of going through this PDP.

In addition, Figure 7.1 also shows that the manual support (S2, produced 13 outcomes) led to a greater number of outcomes compared to the collaborative medium (S3, produced 10 outcomes), the exemplary materials (S4, produced 10 outcomes), and the researcher/facilitator support (S1, produced 7 outcomes). That means that there might be certain types of support

that were favoured by participants more than the others, due to the design decisions taken for designing each type of support. It might also show that teachers were able through the availability of different types of support to work independently without depending that much on the face-to-face sessions provided by the researcher/facilitator support since the researcher/facilitator support was the one that produced least outcomes.

Having said that, this needs further investigation to see: 1) whether teachers will favour the same types of support throughout the design, development, and implementation of the TEL activities or not; and 2) whether other variables such as time (short or long PDP) and technology level (novice, intermediate, or high) will make a difference in the types of support elements favoured and used by participants or not.

7.3- Findings of Sub-RQ3 (What are the positive influencers and barriers that affected teachers throughout the PDP?)

The PDP enabled and motivated teachers to design, develop, and implement CSCL activities, associated with different positive influencers, such as:

- Feeling rewarded from their students, themselves, and the researcher/facilitator (the same point was recognised by Waddell and Pio (2014) when they talked about the importance of having an optimistic and enthusiastic environment that promotes learning).

- Having a flexible and well-planned PDP with a clear objective that took their needs into consideration (Waddell and Pio (2014) highlighted that taking learners' needs into consideration is helpful in promoting learning and Cho et al. (2013) reported that it is important to have a learning environment that encourages shared vision).

- Having a bank of resources available through Blackboard (Brennan (2015) recommended giving access to resources for promoting learning).

- Having manuals and exemplary materials (Kafyulilo et al. (2015) advocated the use of exemplary materials for helping teachers gain a clearer picture of the main objective of their designs and Xie and Bugg (2009) recommended the use of manuals for supporting learners throughout the learning process).

- Having time to practice and implement what was learned (Brennan (2015) recommended to extend practice time for encouraging teachers to design TEL material).

- Being reflective (which aligns with the importance of reflection that acts as a driving force for learning among members in an organisation as stated by Knipfer et al. (2013)).

- Having personal factors such as: 1) loving teaching; 2) having the desire to learn and experience new things; 3) favouring creative ideas; 4) loving to motivate students; 5) being up to date; and 6) being open to new ideas and new teaching methodologies (Pantouvakis and Bouranta (2017) highlighted that peoples' thoughts and behaviour affect the capability of an organisation to learn and the personal factors that teachers mentioned align with this claim).

- Including positive psychological factors such as: 1) self-fulfilment; 2) accomplishment; 3) self-confidence; 4) happiness; and 5) pride. However, psychological factors that included negative feelings such as: 1) fear and worry; 2) frustration; 3) depression; and 4) stress, were reported by a few participants but did not stop them from proceeding in the PDP, as the positive influencers outweighed the barriers (Waddell and Pio (2014) highlighted the influence of positive and negative emotions on organisational learning. Accordingly, this holds true in this study since teachers' positive feelings helped them to learn throughout the PDP process).

Although there were different types of support provided for enabling and motivating the learning process, there will always be not only tangible, but also intangible influencers and barriers that affect having a successful learning environment.

7.4- Findings of Sub-RQ4 (How did teachers respond to the PDP?)

The findings of Sub-RQ4 sought to identify teachers' responses throughout the two cycles of the PDP. In addition, it aimed to triangulate the findings of Sub-RQ1 to show tangible evidence of what teachers produced throughout the PDP by adding different levels of details to understand the outcomes of the PDP accurately (and not superficially) because with these details, we have a clearly portrayed understanding of teachers' actions.

7.4.1- Findings related to the CSCL activities

Firstly, teachers responded differently in the 3-month period of the PDP. They started by designing, developing, and implementing 25 CSCL activities between October 12 and October 31, 2017, and then 44 CSCL activities between November 1 and November 30, 2017, and finally 4 CSCL activities between December 1 and December 12, 2017. These figures show that the rate was relatively high in the first 2 months but dropped significantly in the third month, which was close to the end of the semester when they were busy with students' examinations. The total number of CSCL activities shows that teachers were engaged in the process and were enabled and motivated to produce that amount of CSCL activities in the 3 months, making a total of 73 activities. It is worth mentioning that most participants produced more CSCL activities than they were asked to, indicating that they were motivated throughout the learning process.

Secondly, the eleven participants responded differently in cycles 1 and 2 in terms of the total number of CSCL activities developed in each cycle and some of the learning elements

incorporated in the activities (see Figures 6.9, 6.11, 6.15, and 6.17 for the learning elements which some of them used in cycle 2 and not in cycle 1). For example, in cycle 2, six of them produced more activities, two produced less, and three remained the same. These figures show that the majority in cycle 2 either increased the number of activities or remained the same. Accordingly, we can deduce that the total number of activities designed, developed, and implemented by teachers increased in cycle 2 compared to cycle 1. In addition, a few teachers targeted different learning elements in cycle 2 that were not targeted in cycle 1. This might arise from a slightly enhanced attitude, leading to the number of CSCL activities produced and the number of learning elements used in cycle 2 compared to cycle 1. These outcomes might show alternatively that teachers' attitudes did not change significantly, and their pace remained the same.

Thirdly, the total number of activities for all teachers in cycle one was 34 versus 39 in cycle two. These figures show that the rate of produced activities remained very close and there was not any significant overall change. These figures did not arise for many expected reasons, such as having all the support elements they needed from the beginning so the minor enhancements that took place in cycle two did not appear to make a big difference. It could also have been because the participants kept teaching the same courses throughout the semester and therefore the pace of their students did not allow for more activities to be implemented.

Fourthly, most students responded to the CSCL activities (70 activities completed from a total number of 73 available to them). These figures indicate that teachers did not only design and develop the CSCL activities, but they also implemented them with their students either inside or outside the classroom. Responding to 70 activities out of 73 indicates that students were engaged in the activities. Various interpretations for students responding to the activities

could be suggested such as: students were engaged, motivated, and/or learning in a different way, unlike the ways they used before.

Fifthly, teachers targeted different types of language skills such as reading, writing, listening, speaking, vocabulary, and grammar. However, they used certain language skills more than the others. For example, writing (40) was used the most, followed by vocabulary (22), listening (21), and reading (21), and finally speaking (9) and grammar (5). The difference between writing and all the other language skills was high. In addition, the difference between vocabulary, listening, and reading versus speaking and grammar was high. These figures might be interpreted in different ways, such as teaching certain skills more than others, not providing enough exemplary materials by the researcher/facilitator to help teachers in designing activities for such skills, and/or finding it easier to use the technology tool (Google Slides) for targeting some skills compared to the others.

Sixthly, teachers used certain collaborative strategies in the CSCL activities including: 1) dividing the big task among students where each takes a different part; 2) giving a copy of the same task to all students; and/or 3) asking students to view and correct each other's work. This finding might be interpreted due to them following the same scenario that the researcher/facilitator offered in the provided exemplary materials.

Seventhly, teachers used certain learning elements more than others. In terms of "cognitive-internalisation", all teachers (11 of 11) used certain stimuli such as visual, kinaesthetic, textual, reception, attention, interpersonal, and intrapersonal the most, followed by auditory (7 of 11) and then finally musical (2 of 11). However, social and emotional were not used at all.

In terms of "cognitive-externalisation", all teachers (11 of 11) used writing and presenting the most, followed by completing (5 of 11), speaking (4 of 11), moving (4 of 11), and finally

reporting (1 of 11) and drawing (1 of 11). This outcome could arise for three reasons: 1) the number of exemplary materials that targeted such learning elements were more than the others; 2) the technology tool (Google Slides) was easier when used for designing activities that included these learning elements more than when used with the others; and/or 3) the teachers used the same features they used before and repeated use of these.

In terms of "Cognitive-internal cognitive processing", all teachers (11 of 11) incorporated ICT skills, ICT understanding, searching, questioning, interpreting, acquisition, comprehension, application, evaluation, retention, rehearsal, and retrieval. Those were followed by analysis (8 of 11), synthesis (8 of 11), creativity (6 of 11), generating ideas (5 of 11), imagining (5 of 11), comparing (2 of 11), and reasoning (2 of 11). This shows that teachers incorporated certain learning elements more than others. This could be due to: 1) the ideas they took from the exemplary materials; 2) their 'old habits' regarding the activities' objectives they used to resort to the most; and/or 3) their choice to meet students' needs.

7.4.2- Findings related to feedback/comments shared between teachers

Firstly, all teachers (11 of 11) gave and received feedback/comments to and from other teachers. The minimum number of feedback/comments given was two and the maximum was five. The minimum number of feedback/comments received was three and the maximum was five. These figures indicate that some teachers kept to the minimum number of comments as requested by the researcher/facilitator at the beginning of the PDP and others went beyond that. Those who kept to the minimum number might have done so for different reasons, perhaps related to the limited time they had. However, for those who did more, this might have been for reasons such as: motivation; willingness to listen to more feedback/comments to learn from other teachers; willingness to share their feedback/comments with other teachers who might have asked them to give them feedback/comments on their activities; willingness

to encourage colleagues who were not that confident in terms of using technology in teaching; and/or willingness to learn from each other and share experiences.

Secondly, the majority of CSCL activities did not receive feedback/comments (4 of 73 received 3 comments/feedback; 9 of 73 received 2 feedback/comments; 13 of 73 received 1 feedback/comments; and 46 of 73 received no feedback/comments at all). These figures indicate that there could be rules governing the number of feedback/comments which each activity should receive in order not to leave other activities with no feedback/comments. It is worth highlighting that feedback is important for exchanging ideas and opinions (Alayyar et al., 2012) as it helps teachers to learn from each other and from their practices (Kafyulilo et al., 2016).

Furthermore, reasons behind these figures could include the limited time which teachers had, not allowing them to see activities and be able to comment on them. In addition, having 46 activities out of 73, which is more than half with no comments, suggests that teachers did not benefit from their colleagues' activities and therefore more research is needed on this.

Thirdly, some teachers (6 of 11) received two comments/feedback from the same teacher. This indicates that certain teachers might have favoured the activities of other teachers more or that they might have favoured those teachers specifically. This suggests that there should be rules governing this process so that if one teacher continues to give feedback/comments to one teacher, then they should be advised to widen their exposure and look at other activities from other teachers as well, to share experiences, knowledge, and feedback/comments.

Fourthly, in the video-recorded comments/feedback, teachers talked about: 1) the design of the activity layout on Google Slides; 2) the pedagogy behind the activity; and/or 3) the enhancements that could be done on the activity. This shows that teachers used their own

rules that they created themselves to give feedback/comments to their colleagues since the researcher/facilitator did not give them any rules to follow for exchanging comments/feedback. Accordingly, the type of feedback/comments reflected their perspectives on what they felt was worth commenting on.

7.4.3- Findings related to reflections made by teachers

Firstly, most teachers (10 of 11) shared their activities in a video-recorded format (40 of 73) except for one who shared hers in the form of templates (8 of 73). In addition, not all the activities (25 out of 73 activities) were shared. This indicates that teachers' attitudes differed, since one preferred to share her activities without on-screen video-recorded reflections, unlike the others. This might be because of her limited time and/or concerns in terms of not feeling comfortable in undertaking such an action. The other activities that were not shared at all might also have arisen because of the limited time that teachers had. Accordingly, certain recommendations could be put in place to make sure that all activities are being shared so that other teachers can benefit from them.

Secondly, in the on-screen video-recorded reflections, teachers talked about: 1) the pedagogical objectives behind each activity; 2) how students responded in each activity; and 3) how they as teachers perceived the activity after implementing it. This indicates that teachers used their own rules to reflect on their activities and maybe also others followed them, since the researcher/facilitator did not give them any rules to follow for reflecting on their activities.

7.5- Findings of Sub-RQ5 (What are students' responses towards the TEL activities from teachers' perspectives?)

Sub-RQ5 sought to identify how students responded to the different types of activities from teachers' perspectives. According to the categories found in the CSCL literature in the area of using Web 2.0 technology in CSCL, students' responses fell under the following categories: 1) pedagogical responses (e.g. improvement in writing by Miyazoe and Anderson (2012); increase in vocabulary gain by Lin (2015); speaking enhancement by Sun and Yang (2015); and grammatical accuracy by Wang (2015)); 2) social responses (e.g. communication with colleagues outside the class by Melo-Pfeifer (2015); increase in the sense of community by Miceli, Murray, and Kennedy (2010); peer-bonding by Huang and Hung (2013); and awareness of culture by Kennedy and Miceli (2013)); and 3) affective responses (e.g. less anxiety by Wehner, Gump, and Downey (2011); more motivation by Liu and Lan (2016); and confidence in speaking by Sun and Yang (2015)).

In this study, the findings showed that students' responses fell under the same three categories, but the responses acknowledged by the teachers were different. Firstly, pedagogical responses were acknowledged, such as learning to learn Arabic in a creative way, understanding the material more, typing in Arabic, thinking more deeply and analytically, reading each other's comments, remembering concepts, discussing and correcting each other's work, sharing and voice recording their work. Secondly, social responses were acknowledged, such as collaborating to finish a certain task, and learning from each other. Thirdly, affective responses were acknowledged, such as collaborating in a fun and friendly environment, feeling bored, not interested, not motivated, and distracted.

7.6- Findings of Sub-RQ6 (What are the design principles of an effective implementation of a PDP?)

Sub-RQ6 is concerned with the design principles of an effective implementation of a PDP. From analysing data collected in both cycles 1 and 2, it was observed and noticed that there were certain design principles that should be taken into consideration and others that should be avoided for a successful implementation of the PDP (at least in this context). Before highlighting these design principles, visual representations of a teacher going through the PDP implementation phase in cycles 1 and 2 are presented first.

In cycle 1, the design principles were informed by Laurillard's (2002) conversational framework, Passey's (2011) learning elements framework, the learning design literature review, and the organisational learning literature review (see Figure 7.2 for the scenario).
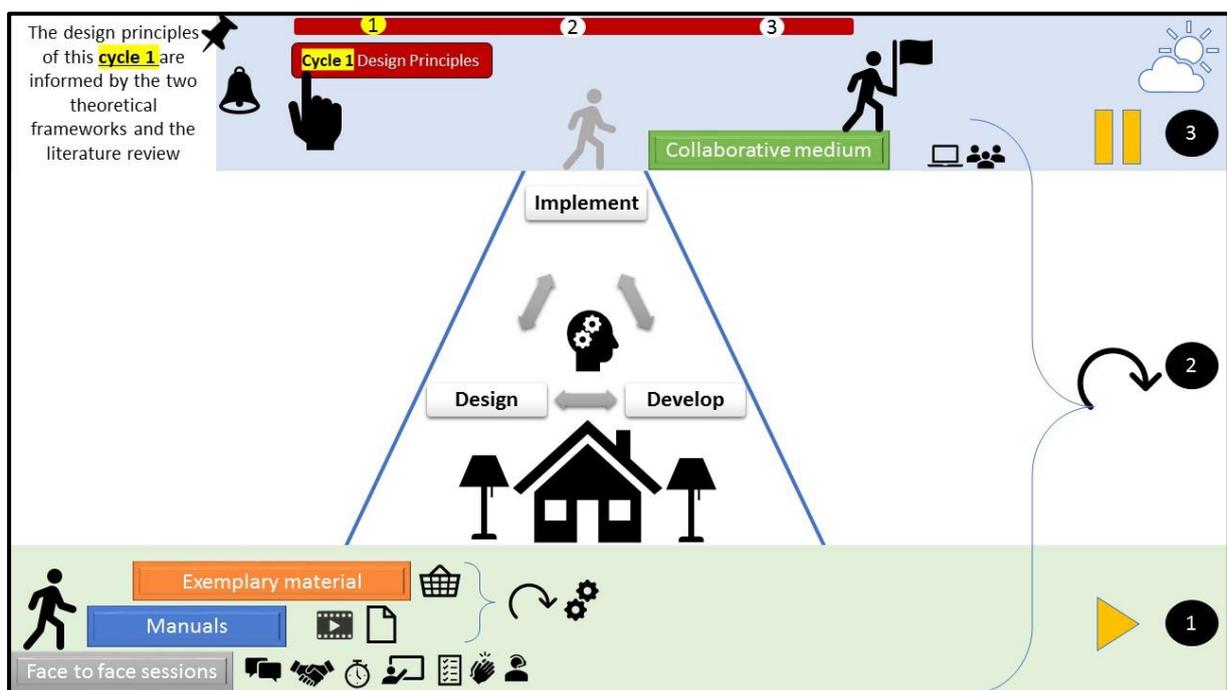
Figure 7.2: Cycle 1 design principles

The scenario proceeds as follows:

1. The teacher (participant) meets with the researcher/facilitator to share her needs regarding the courses she is teaching. The researcher/facilitator agrees with the teacher on a fixed

weekly face-to-face meeting for an hour. In this hour, the teacher designs and develops CSCL activities that can be used in any of her courses. Feedback and on-time support are always provided by the researcher/facilitator in case the teacher has any questions or needs guidance either face-to-face or by email, mobile telephone, and/or text messages.

2. The researcher/facilitator provides the teacher with document and video manuals which can be referred to for guidance, to use as a reference while designing and developing the CSCL activities. Thirdly, the researcher/facilitator provides teachers with exemplary materials in the form of video manuals and templates to offer design ideas. The exemplary materials are real activities that were conducted in class by the researcher/facilitator with her students.

3. The teacher uploads a video through the collaborative medium (Blackboard), reflecting on the activities she designed in this week and shares them with her colleagues who have access to the same collaborative medium. Teachers' colleagues who are participating in the same PDP access the shared activities and provide video-recorded feedback/comments. It is worth highlighting that the entire process was repeated weekly until the end of the semester.

In cycle 2, the same design principles of cycle 1 were taken into consideration in addition to some features that teachers suggested in cycle 1 for enhancing cycle 2 further (see Figure 7.3). The three features that were included in cycle 2 were: 1) adding sound to the video manuals and shortening their duration; 2) providing them with templates of various Google Slides' CSCL activities accompanied with video-recorded pedagogical objectives; and 3) adding a feature in Blackboard where they can respond to their colleagues' feedback/comments on their activities.
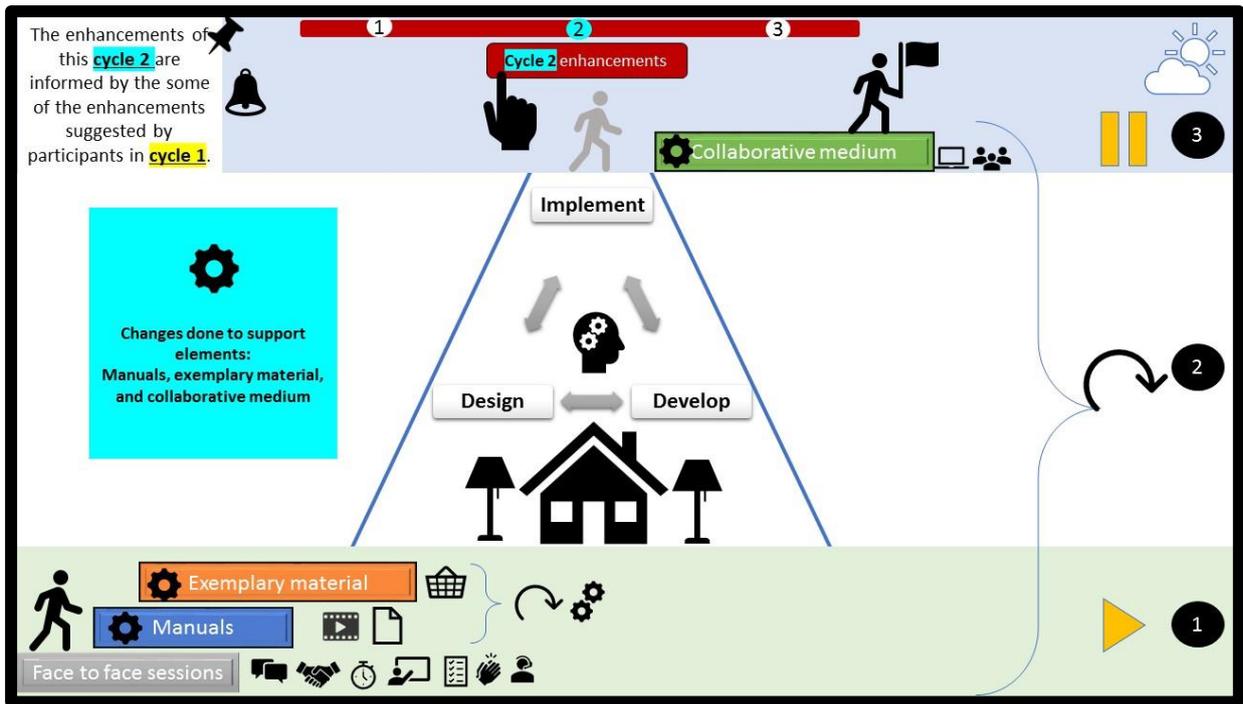
Figure 7.3: Cycle 2 enhancements

Having highlighted the design principles used in cycles 1 and 2, the researcher/facilitator

suggests certain design principles for a successful implementation of a PDP (see Figure 7.4).
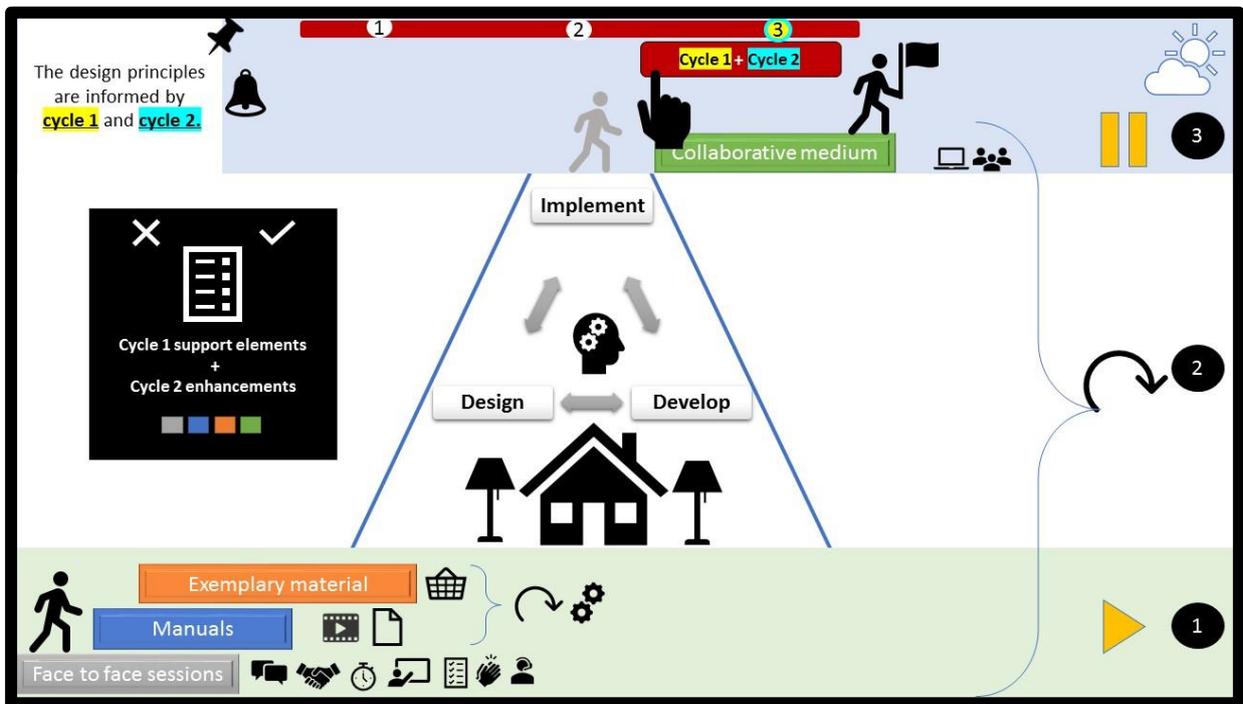

Figure 7.4: The design principles

The design principles rotate around six focal points related to researcher/facilitator support - manuals, exemplary materials, collaborative medium, mode of delivery, and a technology tool used for designing, developing, and implementing CSCL activities. Certain suggestions of what should be included and what should not be included in each support element are also highlighted in order to achieve successful outcomes in similar contexts.

1- **<u>The facilitator support</u>**: This kind of support aligns with Laurillard's (2002) conversational framework in terms of TCC and TPC. During these cycles, for completing them successfully according to evidence gathered in this study, the following design principles should be taken into consideration:

   o It is important to collect teachers' needs before conducting the PDP.

   o The objective of the PDP should be clearly stated and what is expected from teachers to do should be explained step-by-step.

   o The facilitator should schedule a weekly face-to-face meeting with each teacher for discussion and follow up. Following up by meeting them weekly and by having access to their work enables the facilitator to see what they have done and be able to guide them at appropriate times in case they have faced any difficulty.

   o The facilitator should also explain to teachers the expected benefits of applying what they will learn in the PDP on students' learning, by showing them real examples of activities with students' responses.

   o The facilitator should ask teachers to design, develop, and implement at least one activity weekly.

   o The facilitator should provide teachers with: feedback on their work; on-time support whenever needed; manuals that they might need either for themselves

or for their students; and authentic exemplary materials to give them design ideas.

- o Teachers should have the opportunity to implement the activities they designed and developed in class to go through the experience by themselves and be able to see the effect of what they learned about students' learning.

- o The facilitator should use transformational leadership that focuses on motivation, individual consideration, and intellectual stimulation because that motivates teachers to learn in a positive environment.

- o The facilitator should coach the teachers to actively guide and monitor them throughout the process to make sure that they accomplish the tasks assigned to them weekly.

- o The facilitator should give teachers more time by the end of the PDP for examining all their colleagues' activities online and then meet in a face-to-face session and discuss. This way teachers will have the opportunity to become exposed to more activities which they might have missed on the collaborative online medium.

2- **The manuals**: This kind of support aligns with Laurillard's (2002) conversational framework in terms of TPC and TMC. During these cycles, for completing them successfully according to evidence gathered in this study, the following design principles should be taken into consideration:

- o It is important for teachers to refer to both the document and video manuals to help them work independently and be able to use the technology tool for designing and developing the CSCL activities.

- It is recommended to have short video manuals, with the facilitator explaining the steps for catching teachers' attention and for better understanding.
- The manuals should be uploaded on a shared space online so that teachers can access them anytime and anywhere.

3- **The exemplary materials:** This kind of support aligns with Laurillard's (2002) conversational framework in terms of TMC and TPC. During these cycles, for completing them successfully according to evidence gathered in this study, the following design principles should be taken into consideration:

- It is recommended to provide teachers with exemplary materials in a video format to use as reference for gaining activity design ideas. As a follow-up step, teachers can be provided with templates that can be activated and altered or amended to meet their needs. However, it is not advised to provide them with such templates from the beginning of the PDP, because this might discourage them from creating their own designs as too much guidance can limit their engagement (McKenney & Mor, 2015).

- Accompanying the templates with video manuals for further detailed explanation is also advised because this shows them how the activity was implemented in class and how students responded.

- The exemplary materials should be uploaded on a shared space online so that teachers can access them anytime and anywhere.

- It is recommended to create a bank of exemplary materials categorised by language skills (listening, reading, writing, and speaking) for each proficiency level (novice, intermediate, and high).

o Language teachers teach different skills such as reading, listening, writing, speaking, vocabulary, and grammar; therefore, it is important to give them a wide variety of exemplary materials that target the different language skills.

4- **The collaborative medium (Blackboard)**: This kind of support aligns with Laurillard's (2002) conversational framework in terms of PCC and PMC. During these cycles, for completing them successfully according to evidence gathered in this study, the following principles should be taken into consideration:

o Teachers should access all kinds of resources (manuals, exemplary materials, and templates) through an online collaborative medium where they can all access them anytime and anywhere.

o They should be able to collaborate by: 1) uploading their activities to be shared with all colleagues; 2) giving feedback/comments on colleagues' activities; and 3) receiving feedback/comments from colleagues on their activities. All activities and feedback are recommended to be in the form of on-screen video-recorded files uploaded on the collaborative medium to refer to the activities designed, developed, and implemented while providing details and explanations.

o Teachers should give feedback/comments to colleagues in a more structured way so that all teachers can view the activities that each one has implemented. For example, each activity should receive at least one feedback/comment and each teacher should give at least one feedback/comment weekly to a different colleague in order to get exposed to a wide variety of ideas from different teachers.

- o Teachers should give weekly feedback/comments to at least two different teachers to become exposed to more activities from different teachers.

- o Teachers should be advised how to give constructive feedback/comments to their colleagues with recommendations for enhancing the activities further.

- o Teachers should be advised to share the activities after implementation so that their colleagues can see how successful the activity was with the students.

5- **The technology tool**: For the tool that teachers should use for designing, developing, and implementing TEL activities, according to evidence gathered in this study, it is advised to choose a tool that:

- o Affords the activity design needs without technical effort.

- o Has a user-friendly interface that can be used easily by teachers and students that allows them to focus on the activity and not on the technical complexities of the tool.

- o Enables teachers to design and develop different activities that target different language skills.

6- **The delivery mode of the PDP:** It is recommended that for teachers who are: 1) novice in using technology; 2) have different schedules; and 3) distributed in different places, to take a PDP that uses a blended learning flexible model so that they can learn both online and face-to-face. They can learn online through using the manuals and the exemplary materials. In addition, they can learn from the collaborative medium that allows them to share their activities online and send and receive on-screen video-recorded feedback to and from colleagues on the activities they shared. In addition, they can learn through the weekly face-to-face sessions.

7.7- Summary

This chapter discussed the findings of all sub-research questions. In addition, the findings were linked to the literature, and the theoretical framework.

Firstly, the literature on teachers' support and organisational learning concurred with the findings of the sub-research questions. For instance, collecting teachers' needs before conducting the PDP (see Brennan, 2015) was acknowledged by participants as it supported the learning process. In addition, using different types of support such as online (Alayyar et al., 2012), just-in-time support (Kafyulilo et al., 2015), exemplary materials (Svihla et al., 2015), collaborative learning support (Kali et al., 2015), and tailored manuals (Xie & Bugg, 2009) all supported teachers in designing, developing, and implementing the CSCL activities.

Moreover, the findings concurred with the organisational learning literature regarding the positive influencers that lead to engaged learning such as having a supportive and collaborative culture (Bhat et al., 2012), using transformational leadership style and coaching (Bhat et al., 2012; Kyndt et al., 2016), encouraging reflection for learning (Knipfer et al., 2013), supporting positive emotions (Waddell & Pio, 2014), collaborating with organisation members (Schumacher, 2015), providing feedback (Kyndt et al., 2016), accessing and sharing information (Kyndt et al., 2016), and using reflection (Knipfer et al., 2013).

Secondly, the findings aligned not only with the literature, but they also aligned with Laurillard's (2002) conversational framework proposals. In fact, the framework as used succeeded in enabling learners to modulate teachers' concepts and practices by giving them access to a researcher/facilitator's concepts that included different learning support elements guided by the literature. It enabled them to: 1) generate questions and receive extrinsic feedback from the researcher/facilitator; 2) generate actions that elicited intrinsic feedback; 3)

generate feedback/comments for eliciting comments from other peers; and 4) generate outputs to be shared for negotiation. Accordingly, the framework succeeded in achieving its goal, supported also by the literature.

The next chapter focuses on the conclusion, limitations, practical and theoretical implications, and future prospective research.

Chapter 8: Conclusion

This chapter focuses on addressing the following seven points: 1) how the contextual problem was tackled; 2) what can be concluded from the findings of each sub-research question; 3) the theoretical implications; 4) the practical implications; 5) what the study added to the learning design literature in the context of foreign language learning; 6) which gaps in the learning design literature the study tackled; 6) limitations; and 7) recommendations for future research.

8.1-   How the contextual problem was tackled

The main motivation for conducting this study was that, from previous experience, teachers of AFL have not received adequate support or had clear motivation to use technology in their teaching. There were four reasons discussed in the introduction chapter that prevented teachers from integrating technology in their AFL teaching. These reasons are restated here, with additional detail to describe how they were resolved in the PDP, and how this is associated with current literature and the theoretical framework.

8.1.1-   Not having time to communicate their needs or to ask questions

This problem was resolved as teachers: 1) communicated their needs before conducting the PDP; 2) met with the researcher/facilitator face-to-face for an hour weekly; 3) communicated with the researcher/facilitator to ask questions and/or receive feedback using different means such as an instant messaging application, mobile telephones, and/or emails; and 4) received feedback/comments from colleagues to enhance the TEL activities further, but only after implementing them. In addition, the theoretical framework supported the tackling of this problem through the TCC and the PCC cycles. The TCC was applied to communicate with teachers face-to-face and the PCC was applied using Blackboard throughout the two cycles of the PDP. In both cycles, teachers communicated with either the researcher/facilitator and/or

colleagues online for an unlimited number of times. The literature identified ways of tackling

such problems by focusing on: 1) collecting teachers' contextual needs as recommended by

Brennan (2015); 2) sharing an agreed-upon valuable vision in an optimistic and enthusiastic

environment as highlighted by Waddell and Pio (2014) and also by focusing on using

technology as a tool for facilitating communication through commercial software applications

as recommended by Za et al. (2014); 3) supporting dialogue as mentioned by Svihla et al.

(2015) and having collaborative teams that act as a supporting tool as highlighted by Kali et

al. (2015); and 4) providing constructive feedback as highlighted by Cober, Tan, Slotta, So,

and Konings (2015) and Sadaf et al. (2016).

8.1.2- Not knowing how to integrate technology effectively in their classrooms even after the training courses they take and not knowing how to relate what they take in the training course to the classes that they teach

This problem was resolved as teachers: 1) applied what they took in the face-to-face sessions

through designing and developing the TEL activities and then implementing them with their

students in their classes; 2) accessed the exemplary materials which included authentic TEL

activities that were applied in the researcher/facilitator's AFL classrooms; 3) accessed the

video manuals that helped them in using the technology tool (Google Slides); and 4) were

exposed to other teachers' TEL activities to gain more design ideas. In addition, the

theoretical framework supported the tackling of this problem mainly through the TPC, TMC,

and PMC cycles. The TPC was applied to give teachers time to apply what they learned and

the TMC was applied to give teachers access to authentic exemplary materials to refer to

during practice. The PMC was applied to enable an exchange of ideas by using the TEL

activities as models for use as reference during practice. The literature also indicated ways to

help in tackling such problems by providing: 1) exemplary materials as advocated by

Kafyulilo et al. (2015); 2) authentic material for relating the technology tool to real practice as

highlighted by Svihla et al. (2015); 3) manuals for showing how to use the technology tool as supported by Xie and Bugg (2009); 4) extended time to practice what they learned as recommended by Brennan (2015); and 5) an online medium through which teachers can share ideas as advocated by Bhaskar and Mishra (2014).

8.1.3- Having different working hours and being on two different campuses limiting opportunities to attend the training courses

To resolve such problems, the researcher/facilitator applied a blended learning flex model recommended by Horn and Staker (2015) so that learners could learn mainly online and come to meet with the researcher/facilitator face-to-face at fixed times weekly. Accordingly, teachers learned mainly online through accessing the resources (exemplary materials, manuals, templates) provided through Blackboard and then met separately with the researcher/facilitator for one hour weekly, face-to-face. In addition, the theoretical framework supported the tackling of this problem mainly through the TCC where the researcher/facilitator communicated face-to-face for 1 hour weekly with each teacher individually. Accordingly, teachers were not concerned about receiving the training at a set time, as they arranged with the researcher/facilitator to have the session at the times they found appropriate for them. The literature indicated ways of tackling such problems through: 1) taking teachers' needs into consideration prior to conducting the PDP in order to meet them at the times they would find suitable for their schedule as recommended by both Brennan (2015) and Waddell and Pio (2014); and 2) using technology as a medium for online communication between members as highlighted by Za et al. (2014).

8.1.4- Forgetting what they took away because there is neither feedback nor time to practice in a one-hour training course

To resolve such problems, the researcher/facilitator: 1) gave teachers online access to all resources (exemplary materials, manuals, and templates) through Blackboard; 2) provided teachers with instant and constructive feedback in the face-to-face sessions and/or online as needed; and 3) gave them time to practice. In addition, the theoretical framework supported the tackling of this problem mainly through the TCC, TPC and TMC cycles. The TCC was used to provide teachers with feedback, the TPC was applied to give teachers time to practice, and the TMC was applied to give teachers access to the different types of resources, including what was done in the TCC so that they could refer to this whenever needed and that avoided forgetting what they took away. The literature review indicated ways of tackling such problems through: 1) giving access to resources and giving time for practice as recommended by Brennan (2015); and 2) providing feedback on their accomplishments as advocated by Uluyol and Sahin (2016).

Having highlighted how each problem was tackled by the theoretical framework and the literature review, the next section focuses on highlighting the conclusion from the findings of each sub-research question.

8.2- What can be concluded from the findings of each sub-research question?

To know how the PDP affected the contextual problems, six sub-research questions were raised to identify appropriate outcome evidence concerned with: 1) teachers' perceptions towards the PDP; 2) the relationship between the pedagogical outcomes and the different types of support provided; 3) the positive influencers and barriers that affected teachers' learning; 4) teachers' responses throughout the different phases of the PDP; 5) students'

responses towards the TEL activities from teachers' perspectives; and 6) the design principles of an effective implementation of a PDP.

8.3- Conclusions related to Sub-RQ1 (How did teachers perceive the PDP?)

8.3.1- Researcher/facilitator support

The results and findings (refer to sub-sections 6.1.1 and 7.1.1 for evidence) showed that all teachers perceived the researcher/facilitator support positively for reasons related to: 1) personal factors associated with the transformational leadership style; and 2) professional factors associated with providing different types of support, and coaching.

Thus, the study findings indicate that: 1) applying transformational leadership style is effective (Bhat et al., 2012); 2) coaching is essential for motivating teachers to complete the assigned tasks (Kyndt et al., 2016); 3) mastering the three knowledge domains - content, technology, and pedagogy - is essential in training teachers effectively (Alayyar et al., 2012); and 4) providing different types of support to help teachers throughout the different phases of the PDP is needed (Kafyulilo et al., 2015).

What does this add to the literature? In the literature, the support provided by the facilitator has not always been perceived as being that helpful in certain instances, concerned with: 1) the quality and amount of input (Nguyen & Bower, 2018); and 2) if not there, problems can occur in the design (Huizinga et al., 2014). However, such support was perceived positively in other instances, when supervising teachers during the follow-up phase (Asensio-Pérez et al., 2017) and providing feedback (Jia et al., 2018).

Having said that, this study has added more details to the learning design literature since the reasons (personal and professional factors) behind perceiving the facilitator support positively were more than the ones reported in the literature. In addition, teachers did not raise concerns

about the amount of input provided or having problems arising when the researcher/facilitator was not there.

8.3.2- Exemplary materials and templates

The results and findings (refer to sub-sections 6.1.2 and 7.1.2 for evidence) showed that most teachers perceived the exemplary materials support positively for reasons related to benefits gained and features embedded.

What does this add to the literature? The learning design literature mentioned the benefits that teachers perceived from the exemplary materials such as: 1) providing teachers with an operational and complete picture of the design task (Kafyulilo et al., 2015); 2) promoting a better understanding of what integrating technology in lessons is about, promoting pedagogical design capacity, providing concrete 'how to do' suggestions and facilitating a better implementation of the innovation (Agyei & Voogt, 2012); and 3) understanding the integration of technology in their subject and helping them during implementation in classroom practice (Voogt et al., 2005).

In this study, the same was reported by teachers, but this study unlike other studies provided details regarding: 1) the design principles used for designing the exemplary materials (see section 3.2); and 2) the number of exemplary materials provided and their features (see sub-section 4.1.6). As a result, providing teachers with exemplary materials that has certain features can benefit them in their design, development, and implementation of TEL activities. Accordingly, other PDP designers can consider this detailed explanation for ease of replication in their own contexts.

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8.3.3- Manuals

The results and findings (refer to sub-sections 6.1.3 and 7.1.3 for evidence) showed that most teachers perceived the manuals positively for guiding them while designing their CSCL activities since they used them as references for remembering instructions. In addition, others perceived them negatively for reasons related to psychological factors, technical factors, and professional factors. As a result, providing video manuals that take into consideration teachers' needs (e.g. perceptions, technical, and/or professional factors) is likely to enable greater independent learning as they can use them for guidance during the design process. This aligns with what Xie and Bugg (2009) recommended in terms of providing tailored manuals for learners with detailed instructions.

What does this add to the literature? The learning design literature mentioned the use of the manuals for giving a detailed step-by-step guidance (Asensio-Pérez et al., 2017) for supporting teachers during their designs, but nothing was mentioned regarding how teachers perceived the manuals and details regarding the design of the manuals. In this study, reasons behind teachers' positive and negative perceptions were reported in addition to details regarding the design of the manuals (see sub-section 4.1.7).

8.3.4- Feedback/comments

The results and findings (refer to sub-sections 6.1.4 and 7.1.4 for evidence) showed that most teachers perceived the feedback/comments exchanged between them in the online collaborative medium (Blackboard) positively for reasons related to: 1) psychological; and 2) professional factors. However, the effect of these feedback/comments can be perceived as: 1) neutral due to professional reasons related to lack of time; or 2) negatively due to cultural and professional reasons such as feeling embarrassed to give an honest feedback. As a result, we can conclude that: 1) exchanging video-recorded feedback/comments promotes learning, but,

some learners can still reach their objective without using them, so its effect might be neutralised; and 2) cultural and professional factors can affect the quality of feedback/comments exchanged, so that they appear more positive than is the case.

What does this add to the literature? In general, collaborative learning was also acknowledged in the literature for: 1) increasing teachers' use of technology (Kafyulilo et al., 2015); 2) enhancing teachers' interactional skills (Schumacher, 2015); and 3) facilitating the learning process (Bhat et al., 2012). In addition, in the learning design literature, it was found that the feedback from peers was perceived positively by teachers during: 1) implementation (Voogt et al., 2005); and 2) exchange of ideas and opinions (Alayyar et al., 2012). In fact, the same positive perceptions were also reported by this study, but the reasons behind these positive perceptions have been categorised as personal and psychological, in addition to teachers' negative and neutral perceptions.

8.3.5- Reflections

The results and findings (refer to sub-sections 6.1.5 and 7.1.5 for evidence) showed that teachers benefitted from the shared on-screen video-recorded reflections that took place in the collaborative medium for: 1) technological reasons; 2) professional reasons; and 3) pedagogical reasons. As a result, we can conclude that: 1) uploading video-recorded reflections enhances different types of learning; and 2) reflection leads to more expansive learning due to knowledge share and exchange.

What does this add to the literature? In the learning design literature, reflection based on the feedback from students and practical experiences helped teachers to learn from each other (Kafyulilo et al., 2016). In this study, the same was reported, but this study has shed light on

the different types of reasons (technological, pedagogical, and professional) that led teachers to perceive reflection positively, not highlighted in the learning design literature previously.

8.3.6- Responding to colleagues' feedback/comments

From the results and the findings (refer to sub-sections 6.1.11 and 7.1.6 for evidence), it was found that teachers perceived this kind of support positively for removing ambiguity and expressing their points of view. Accordingly, it can be concluded that providing an online medium for supporting dialogue among participants motivates the learning process because it: 1) opens space for discussion whenever and wherever needed; and 2) provides clarity and removes ambiguity.

What does this add to the literature? In fact, the importance of dialogue for more expansive learning (Svihla et al., 2015) was acknowledged in the literature and, therefore, this conclusion is in line with it. However, this study added more details regarding the format of the exchanged feedback/comments as they were in the form of on-screen video-recorded files exchanged online through Blackboard.

8.3.7- CSCL

From the results and findings (refer to sub-sections 6.1.6 and 7.1.7 for evidence), it was found that CSCL was perceived positively by most teachers as it had positive impact on students' learning since it enabled them to share and build knowledge in a collaborative environment where they could exchange feedback in a 'fun' environment that enabled students to focus on the task at hand. However, for one teacher, the application was also found to create difficulties when students resisted the use of technology in learning. Accordingly, it can be concluded that learning through CSCL enhances students' learning and enables teachers to

enhance students' engagement in the learning process. However, its effectiveness can be neutralised if students resist the use of technology in learning.

What does this add to the literature? This conclusion aligns with Jones (2015), who highlighted the importance of using CSCL in enabling learners to share knowledge in a collaborative environment. In addition, this study has contributed to the leaning design literature since none of the studies according to the researcher/facilitator's knowledge targeted the design of CSCL activities in their PDPs (refer to Table 2.2 and Figure 2.5).

8.3.8- Google Slides

The results and findings (refer to sub-sections 6.1.7 and 7.1.8 for evidence) of teachers' perceptions towards Google Slides as a technology tool for designing, developing, and implementing CSCL activities were found positive for reasons related to: 1) technological factors; 2) professional factors; and 3) pedagogical factors. However, other technological factors such as having short slide length and missing certain Arabic fonts can neutralise its use. As a result, we can conclude that when the technology tool is user-friendly, the focus can be more on the design, development, and implementation of the TEL activity rather than its technological complexity.

What does this add to the literature? This conclusion aligns with the technology affordances body of knowledge that highlight that it is the properties of an object that can affect its use (Järvelä et al., 2015). However, the results of this study showed that it is not only the technological affordances of the tool, but also the pedagogical and professional affordances that can encourage or discourage teachers to use the design tool. This is considered a contribution to the learning design literature because none of the studies according to the

researcher/facilitator's knowledge considered teachers' perceptions regarding the technology tool they used for designing, developing, and implementing the learning activities.

From a practitioner perspective, it can be inferred that Google Slides as a choice of technology tool used by teachers throughout the PDP can contribute in solving the problem of these teachers' inabilities and demotivation to design, develop, and implement TEL activities due to technological, professional, and pedagogical factors.

8.3.9- Overall perceptions towards the PDP

The results and findings (refer to sub-section 6.1.12 and section 7.1 for evidence), show that all teachers acknowledged that the PDP: 1) enabled and motivated them to design, develop, and implement CSCL activities because it was a new way for learning and teaching; 2) motivated them because they were trained on the same topic at the same time; 3) saved them class time; 4) provided room for innovation; 5) enabled students to become engaged in the activities; 6) was systematic and organised; 7) motivated them to learn; 8) took their needs into consideration; 9) and the arrangement was logical, coherent, and connected.

From studying these teachers' perceptions towards the PDP, it can be inferred that when the PDP is well organised, the support elements are available, and the learners have an urge to learn, then positive outcomes can be achieved.

8.4- Conclusions related to Sub-RQ2 (What types of pedagogic outcomes are produced and how do they relate to the ways that teachers used different forms of support?)

From the results and findings (refer to sections 6.2 and 7.2 for evidence), it was found that the support elements (researcher/facilitator support, manuals, exemplary materials, collaborative medium) produced three types of pedagogical outcomes (organisational action and applications, changes in attitude, and knowledge gain). This infers that all types of support

were of importance to these teachers, but not equally, since some pedagogical outcomes were produced as a result of either one type of support, two types of support, three types of support, or four types of support (refer to Figure 7.1). Having said that, more investigation is needed to know which types of support teachers can depend on more than the other and in which phase (design, development, or implementation of CSCL activities), and across different contexts.

What does this add to the literature? The learning design literature does not tackle pedagogical outcomes and their relationship to different types of support provided. Accordingly, this study contributes to the learning design body of knowledge with respect to foreign language learning by highlighting this aspect, which might guide PDP designers in providing specific types of support for achieving certain pedagogical outcomes. In addition, it contributes to the organisational learning and learning design bodies of knowledge and closes a gap in the literature since there is a lack of insights concerning which learning conditions lead to which learning outcomes (Kyndt et al., 2016).

8.5- Conclusions related to Sub-RQ3 (What are the positive influencers and barriers that affected teachers throughout the PDP?)

From the results and findings (refer to section 6.3 and section 7.3 for evidence) of teachers' perceptions towards the PDP, it can be concluded that positive influencers (psychological, personal, technical, professional, and learning) and barriers (psychological and technical) can affect teachers' abilities and motivation to design, develop, and implement CSCL activities positively.

What does this add to the literature? This conclusion aligns with the organisational learning literature in terms of the positive influencers that encourage learning in an organisation that state that: 1) optimistic and enthusiastic environments promote learning (Waddell & Pio, 2014); 2) positive and negative emotions affect organisational learning (Waddell & Pio,

2014); and 3) extended practice time encourages teachers to design TEL material (Brennan, 2015). In addition, the learning design literature mentions implicitly a few influencers that affect teachers throughout the PDP such as: facilitator support and group collaboration (Nguyen & Bower, 2018); a longer workshop (Asensio-Pérez et al., 2017); and facilitator's feedback (Jia et al., 2018). However, this study mentioned more influencers, categorised by type such as: 1) psychological influencers; 2) personal characteristics influencers; 3) technical influencers; 4) professional influencers; and 5) learning factors.

In addition, the learning design literature mentions in an implicit way certain barriers that hindered teachers from achieving the PDP objectives such as: 1) lack of time (Voogt et al., 2005); 2) ill-defined shared vision (Huizinga et al., 2014); 3) the large number of tools that caused an overload during the design process (Nguyen & Bower, 2018); and 4) having ill-structured project orientation (Jia et al., 2018). In this study, teachers did not encounter these difficulties; this might be due to the design of the PDP that was based on the organisational learning literature acknowledging the positive influencers and barriers that affect learners in an organisation. In addition, the only barriers that were reported in this study were categorised under psychological and technical and these barriers were not reported in the learning design literature previously, which offers a contribution to the learning design body of knowledge with respect to foreign language learning.

8.6-   Conclusions related to Sub-RQ4 (How did teachers respond to the PDP?)

From the results and findings (refer to sections 6.4 and 7.4 for evidence), the following two points can be concluded:

1- Although learning conditions (the different support tools) could be available, it will always be the learners' choice to learn or not. This concurs with the

organisational learning body of knowledge since Tynjälä (2008, as cited in Kyndt et al., 2016) reached the same conclusion.

2- Teachers' responses showed their tangible productions throughout the PDP. This reveals whether they contributed throughout the PDP or not and how they responded back to the different support types provided. This aligns with Wenger's claim (1998) as he reached the same conclusion that it is the learners who respond to the design and not the design that affects learners' practice.

What does this add to the literature? The learning design body of knowledge does not explore teachers' responses in terms of inspecting and analysing artefacts (designed activities, feedback/comments exchanged, and reflections) that they produced, so this element offers an original contribution. Teachers' responses are evidence of the success or failure of a PDP, because this can help the PDP designer adjust the design based on these responses after analysing them.

The next sections show in detail what can be concluded from teachers' responses towards the: 1) CSCL activities, and 2) exchanged feedback/comments and reflections.

8.6.1- CSCL

From the results and the findings (refer to sub-section 6.4.1 and 7.4.1 for evidence), it can be concluded that: 1) Google Slides enabled teachers to design, develop, and implement CSCL activities that targeted different language skills; incorporate different language skills; and use various learning elements related to cognitive learning; and 2) time was a positive factor that gave teachers the opportunity to practice what they learned, share activities, and exchange feedback/comments.

In addition, it can be concluded that Passey's (2011) learning elements framework is recommended to be used for: 1) guiding teachers to know which learning elements they ignored and which they focused on more; 2) guiding teachers further when designing, developing, and implementing different types of CSCL activities that take into consideration other learning elements, to focus on those that are found appropriate across the width of learning element possibilities; 3) giving a detailed description of the design of TEL activities; and 4) evaluating technology tools by highlighting which learning elements teachers can use in designing TEL activities.

What does this add to the literature? By linking this conclusion to the learning design literature, this study is considered a contribution to the learning design literature that target foreign language because:

- Passey's (2011) learning elements framework was used in the design and analysis of the TEL activities and that was not tackled before in the learning design literature.

- The Web 2.0 tools used in the literature of foreign language teaching and learning, were: 1) blogs for communicative writing (Chen, Shih, & Liu, 2015) and peer-feedback (Miceli et al., 2010); 2) voice blogs for developing communicative skills and speaking (Hsu, 2016); 3) wikis for promoting and fostering collaborative writing (Wang, 2015); 4) YouTube for developing speaking proficiency (Sun & Yang, 2015); 5) Google Docs for vocabulary improvement (Liu & Lan, 2016); 6) comic cartoons for developing reading skills (Donuk & Kutlu, 2013); 7) e-journals for engaging low-achieving students (Lee, 2012); and 8) Second Life for lowering students' anxiety (Wehner et al., 2011). However, neither the foreign language teaching and learning literature nor the learning design literature mention Google

Slides as a Web 2.0 tool used for designing, developing, and implementing CSCL activities. As a result, using Google Slides for designing, developing, and implementing CSCL activities for targeting different language skills is considered a contribution to the learning design literature.

- The foreign languages mentioned in the foreign language teaching and learning literature targeted English (e.g., Ciftci & Kocoglu, 2012), German (Dixon & Hondo, 2014), Portuguese (Melo-Pfeifer, 2015), Italian (Miceli et al., 2010), and Spanish (Wehner et al., 2011). In addition, the learning design literature neglected foreign language learning and the only languages that are represented in general are: 1) French (Voogt et al., 2005); 2) Mandarin (Ma, Xin, & Du, 2018); and German (Huizinga et al., 2014). Accordingly, this study was a contribution because AFL was the target subject field.

- The design objectives in the learning design literature under-represented the design, development, and implementation of CSCL activities as most of the studies focused on designing lessons (refer to Table 2.2 and Figure 2.4). As a result, this study is a contribution to the learning design literature that target the design of activities.

8.6.2- Feedback/comments and reflections

In terms of feedback/comments, from the results and the findings (refer to sub-sections 6.4.2, 6.4.3, 7.1.4, and 7.1.5 for evidence), it was found that: 1) teachers' responses might be random and/or biased if they did not follow rules to govern the process; and 2) not all teachers followed what they were asked to do.

What does this add to the literature? In the learning design literature feedback/comments and reflections were not exchanged online in a video-recorded format before. In addition, their content was not analysed to highlight teachers' responses while exchanging feedback/comments among each other or sharing activities online. As a result, by giving details regarding teachers' responses, this is considered a contribution to the learning design body of knowledge with respect to foreign language. Accordingly, more investigation is needed in this area to see how teachers will respond in other contexts.

8.7-   Conclusions related to Sub-RQ5 (What are students' responses towards the TEL activities from teachers' perspectives?)

From the results and the findings (refer to sections 6.5 and 7.5 for evidence), most students' responses as indicated by teachers were found to be positive, except for one who found that application with students led to negative responses. Students' responses were categorised as: 1) pedagogical; 2) social; and 3) affective.

What does this add to the literature? In the learning design literature, students' responses are not explored except in one recent study conducted by Asensio-Pérez et al. (2017) in which they reported that students' feedback was positive, without giving any details. This study highlights more details in terms of the types of responses (pedagogical, social, and affective) which teachers reported regarding students' responses towards the CSCL activities. Accordingly, it can be inferred that there is a need for further investigation to understand the pedagogical, social, and affective factors that lead to these types of responses to understand better the responses, especially when students' responses are negative.

8.8-   The theoretical and practical implications

Firstly, it is important to highlight that teachers in this context responded positively to the PDP that was designed in reference to Laurillard's (2002) conversational framework.

Generally, the framework was useful, since it helped in providing a high-level view of the design of the PDP. It also directed the researcher/facilitator to the different components of the literature review concerning the support elements that could be used in the PDP for enabling teachers to design TEL activities. However, one of the main drawbacks of the theoretical framework was that it was more abstract than detailed. In other words, it is not designed for a certain field or a certain age group, so it did not tell in detail what support elements should be included in each phase in the TCC, TPC, TMC, PCC, and PMC cycles. For example, the support elements will differ in higher education when compared to schools (each has different educational system and policies). Another drawback is that in the TMC cycle, the framework did not talk about certain design principles for developing the exemplary materials. In fact, the design criteria used for modelling the exemplary materials differ from one field to another. Here the researcher/facilitator used Passey's (2011) learning elements framework to inform the design of the activities. However, in other contexts, modelling the practice might need other theoretical frameworks to inform the model of the exemplary materials. Accordingly, these above-mentioned points should be considered by PDP designers, developers, and implementers in order to effectively guide their own processes.

Secondly, the researcher/facilitator suggests visualising Laurillard's (2002) conversational framework in the way presented in this study (refer to Figure 8.1). In that way, the support elements can be used in all cycles with the facilitator in the middle, orchestrating the whole process, going back and forth between all cycles (TCC, TPC, TMC, PCC, PMC), so more easily meeting the needs of the learners and reaching the PDP objective. That depends on the needs of both the facilitators and the learners, so it is hard to say which support element fits in which cycle more.

Thirdly, in the analysis of data, it was hard to categorise the data in relation to the five cycles (TCC, TPC, TMC, PCC, PMC) because the support elements overlap, so the researcher/facilitator categorised the findings in the sub-research questions according to the support elements extracted from the literature review.

Based on the above, the researcher/facilitator recommends the following:

1- To make the theoretical framework sufficiently detailed, the PDP designer, developer, and/or implementer should review the literature for guiding the process, so that where the cycle begins is informed by the theoretical framework that guides the literature review and then the literature review returns and feeds the theoretical framework again, as visualised in Figure 8.1.
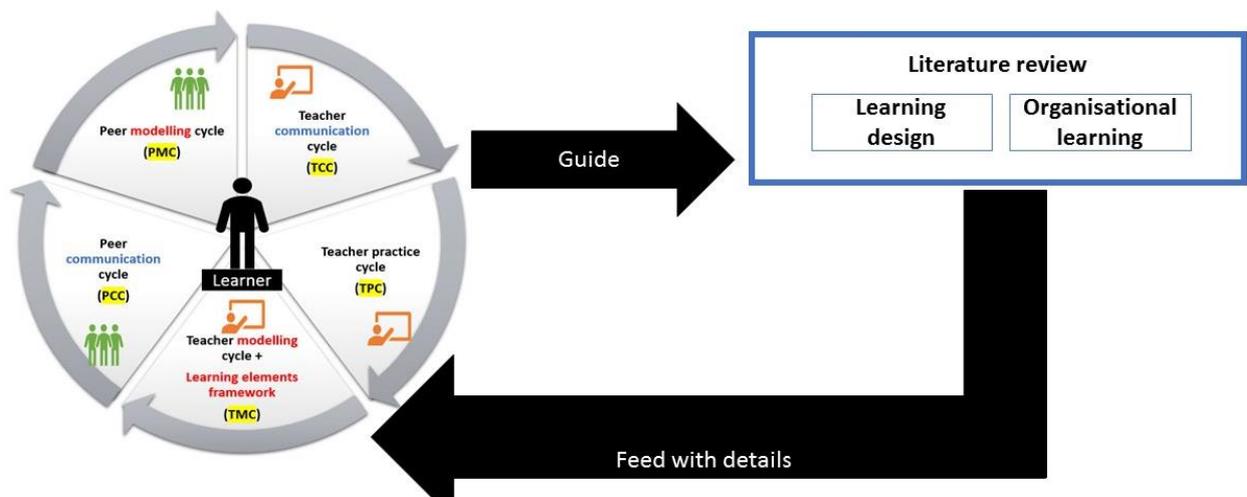
Figure 8.1: The relationship between the theoretical framework and the literature review

2- To guide the design process in the TCC cycle, the following support elements should be included, but not exclusively:

   o supporting dialogue (Svihla et al., 2015);

   o having an available facilitator who is knowledgeable (Kafyulilo et al., 2015);

   o sharing the same vision (Espuny & Bertran, 2013);

- providing face-to-face support (Kafyulilo et al., 2015) and online support (Alayyar et al., 2012);

- providing online learning material (Kafyulilo et al., 2015); and

- scaffolding the learning process (Svihla et al., 2015).

3- To guide the design process in the TPC cycle, the following support elements should be included, but not exclusively:

- providing feedback (Uluyol & Sahin, 2016);

- meeting learners' contextual needs (McKenney & Mor, 2015);

- linking technology applications to instructional practices (Angeli & Valanides, 2009);

- engaging learners in the design (Kali at al., 2015);

- enabling teachers to observe the benefits of using technology and providing outcomes of intrinsic value (Uluyol & Sahin, 2016);

- supporting feelings of inclusion and ownership for motivating learners (Cober et al. 2015); and

- having autonomy over learning (Sadaf et al., 2016).

4- To guide the design process in the TMC cycle, the following support elements should be included, but not exclusively:

- modelling (Svihla et al., 2015);

- providing exemplary materials (Voogt et al., 2005);

- designing for authentic use (Kali at al. 2015); and

- referring to a theoretical framework such as Passey's (2011) learning elements framework that guides:

- the design of the models provided to teachers in the form of exemplary materials; and

- the use of the technology tool for internalising and externalising the learning elements during the design, development, and implementation of the TEL activities.

5- To guide the design process in the PCC and PMC cycles, the following support elements should be included, but not exclusively:

- encouraging the sharing of knowledge among learners (Knipfer et al., 2013);

- encouraging cooperation among learners (Schumacher, 2015);

- encouraging the transfer of knowledge among learners (Bhaskar & Mishra, 2014); and

- facilitating access to information (Kyndt et al., 2016).

6- To facilitate learning and communication among learners and the facilitator, it is important to use a commercial software such as Blackboard (Za et al., 2014).

In addition, externalisation in Passey's (2011) learning elements framework should include two more learning elements - colouring and selecting. Both were used in the exemplary materials using Google Slides to reveal students' learning.

Based on the above, this study contributes to the learning design body of knowledge by providing new design principles for training teachers on how to design TEL activities in the context of foreign language learning. In addition, the study contributes to the knowledge of how Laurillard's (2002) conversational framework and Passey's (2011) learning framework can be used in PDP contexts that target TEL design, development, and implementation.

The results of this study provide important insights into the use of Laurillard's (2002) conversational framework in the design and development process of PDPs for teaching AFL. In line with that, it can assist instructional designers who want to design, develop, and implement similar PDPs for teaching foreign languages using the design principles listed in section 7.6. These design principles can act as guidelines for enabling teachers to design, develop, and implement TEL activities in new settings.

Having highlighted the theoretical and practical implications, the next section lists all the contributions that this study added to the learning design body of knowledge in the context of foreign language learning.

8.9- What did this study add to the learning design literature in terms of training teachers on how to design TEL activities in the context of foreign language learning?

In no specific order, this study contributed in:

1. Providing more details categorised by type regarding how teachers perceived the different types of support provided, related to: facilitator support; manuals support; exemplary materials; and the collaborative medium that included feedback/comments exchange and reflection among teachers. This level of detail was not covered in the learning design literature before. For example:

   o In the facilitator support, teachers' positive perceptions were categorised under personal and professional.

   o In the exemplary materials support, teachers' positive perceptions were categorised under benefits and features.

- o In the manual support, teachers' positive perceptions were categorised under professional, while negative perceptions were categorised under technical and psychological.

- o In the collaborative medium support, teachers' positive perceptions towards reflecting on their own activities were related to technological, professional, and pedagogical reasons. In the feedback/comments support, teachers' perceptions were categorised under psychological and professional factors, while neutral perceptions were related to professional reasons, and negative perceptions were related to cultural and professional reasons.

2. Highlighting the pedagogical outcomes and their relationship with the different types of support (refer to sections 6.2 and 7.2). This was a neglected gap in the learning design literature not tackled before. However, in this study, different pedagogical outcomes were identified, categorised under: organisational action and application; change in attitude; and gain in knowledge. In addition, the relationship between these types of outcomes and the support provided were highlighted.

3. Highlighting the influencers and barriers that affected teachers throughout the PDP (refer to sections 6.3 and 7.3). This was under-represented in the learning design literature and not tackled explicitly before. However, in this study, numerous positive influencers were highlighted, categorised under: psychological factors, personal characteristics, technical influencers, professional influencers, and learning factors. In addition, more barriers were highlighted categorised under psychological and technical.

4. Inspecting teachers' produced artefacts such as the CSCL activities and the video-recorded reflections and feedback/comments (refer to sections 6.4 and 7.4). This was a neglected gap in the learning design literature.

5. Highlighting students' responses from teachers' perspectives in terms of how they perceived the CSCL activities (refer to sections 6.5 and 7.5). In the learning design literature, this aspect was covered superficially by just one study conducted by Asensio-Pérez et al. (2017) who highlighted that students' perceptions were positive, without giving any details. However, in this study, students' responses were categorised as pedagogical, social, and affective.

6. Providing more pedagogical and psychological reasons for having successful or unsuccessful students' outcomes behind applying CSCL in foreign language settings (refer to sub-sections 6.1.6 and 7.1.7).

7. Providing teachers' positive technological and pedagogical reasons behind using Google Slides as a tool for designing, developing, and implementing CSCL activities (refer to sections 6.1.7 and 7.1.8). That was not tackled in the learning design literature before.

Having highlighted the contributions of this study to the learning design in the context of foreign language learning, the next section lists the gaps (the ones that are under-represented and neglected in the learning design literature) that were tackled in this study.

8.10- Which gaps in the literature did this study tackle?

In no specific order, the gaps that were tackled were:

1. Targeting in-service teachers in higher education, as this was under- represented in the literature (refer to Figure 2.1).

2. Targeting activities as a design objective in general and collaborative learning activities specifically, as this was under-represented in the learning design literature (refer to Table 2.2 and Figures 2.4 and 2.5)

3. Targeting AFL as a subject field with its different language skills, as this subject was neglected in the learning design literature (refer to Figure 2.4).

4. Supporting teachers not only in designing and developing activities, but also in implementing them, as this was under-represented in the literature (refer to Figures 2.1, 2.2, and 2.3).

5. Producing design principles that can guide other PDP designers (refer to section 7.6). That was not covered by the learning design reviewed literature before (refer to Figure 2.1 and sub-section 2.1.1).

6. Using Laurillard's (2002) conversational framework for guiding the design of the PDP (refer to section 3.1) unlike TPACK which was used by most of the studies in the learning design literature (refer to Figure 2.1 and sub-section 2.1.1).

7. Using Passey's (2011) learning elements framework for guiding the exemplary materials and analysing the CSCL activities produced by teachers (refer to section 3.2), as this was neither covered in Laurillard's (2002) conversational framework in the TMC cycle (refer to section 3.2) nor in the learning design literature.

8. Highlighting that it is Passey's (2011) learning elements framework that guides the design and analysis of TEL activities, and regardless of the names of the Web 2.0 tools used such as Wikis, blogs, etc., and the language skills they targeted, it is this framework that can give a clear picture of the design of the designed objective (units, lessons, and/or activities).

9. Providing theoretical implications of Laurillard's (2002) conversational framework (refer to section 8.8), as theoretical implications in general was an under-represented area covered by one study only (Jimoyiannis, 2010).

10. Providing practical implications (refer to section 8.8) for PDP designers by using the design principles provided in designing, developing, and implementing other PDPs. In general, practical implications were covered in the learning design literature, but in this study, they are focused through the theoretical framework used, so different implications are suggested.

11. Using blended learning as a mode of delivery (refer to sub-section 4.1.1), as this was under-represented in the literature.

12. Providing details for designing the different types of support (refer to sub-sections 4.1.6, 4.1.7 and 4.1.10). The learning design literature did not give any design details for PDP designers or researchers to replicate their studies, but just mentioned different types of support used without highlighting the design elements included in each.

13. Representing data visually for transparency and deep analysis to give the reader a clear understanding of the data gathered and analysed (refer to sections 6.2 and 6.4). This was not done in the learning design literature previously.

14. Using design-based research as a research methodology (refer to section 5.2). This was not used according to the researcher/facilitator's knowledge in the learning design literature before, except that used by Laurillard et al. (2018) but not for designing, developing, and implementing a PDP.

15. Guiding the reader in terms of which bodies of knowledge to consult in order to design the different types of support. Figures 8.2 to 8.5 below highlight the elements related to the facilitator support, exemplary materials, manuals, and the collaborative

medium in terms of: 1) the literature review (learning design and organisational learning) that guided the design of this type of support; 2) the cycles that mirror each one in Laurillard's (2002) conversational framework; and 3) the types of pedagogic outcomes produced by teachers as a result of using each. In addition, Figure 8.3 shows the theoretical framework (Passey's (2011) learning elements framework that guided the design of the exemplary materials and filled in the gap in the TMC cycle of Laurillard's (2002) conversational framework).
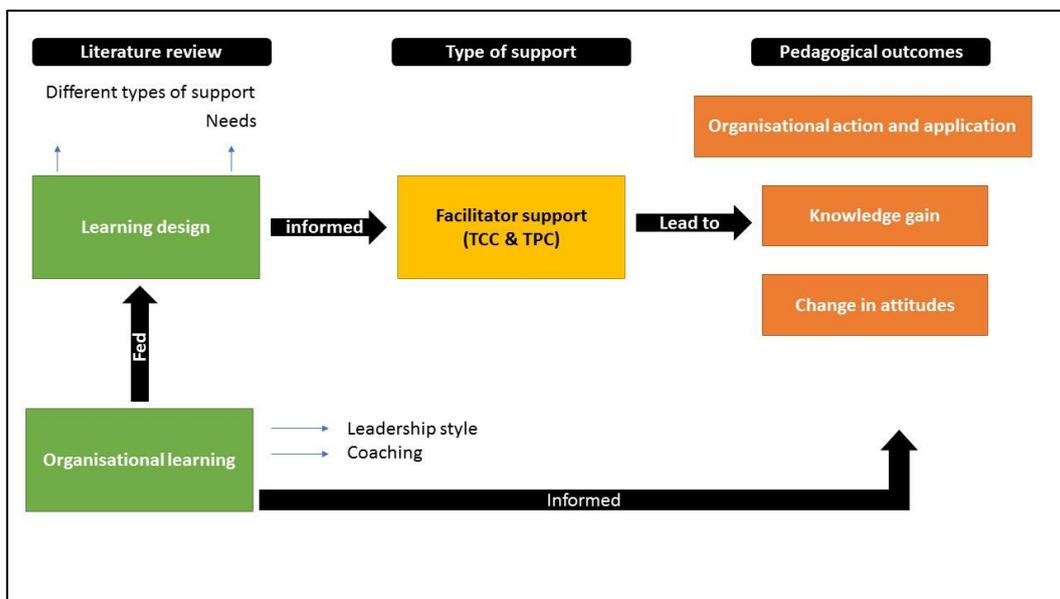
Figure 8.2: Facilitator support
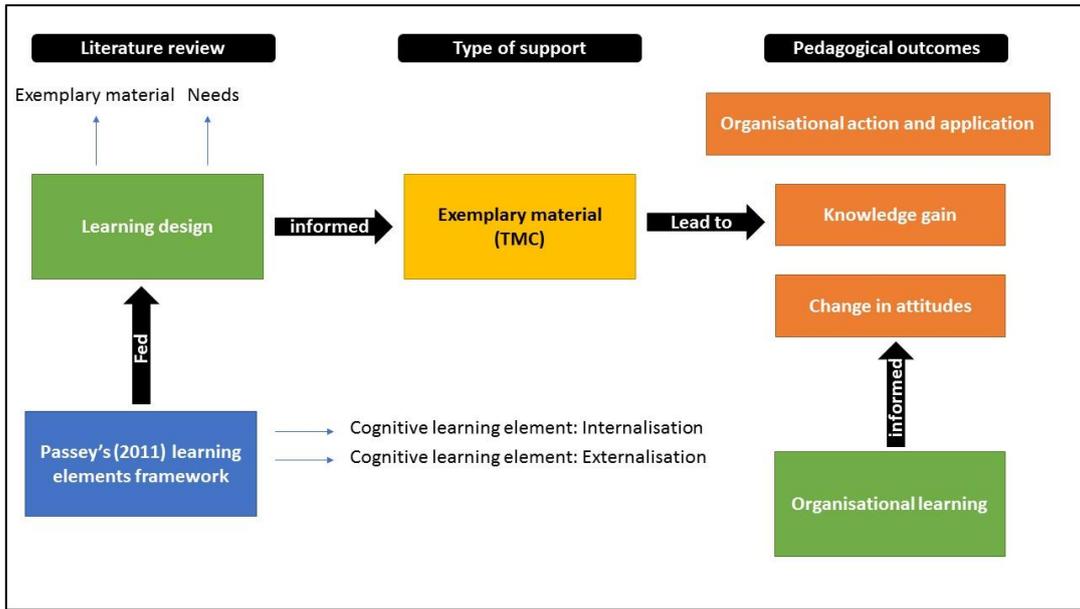
Figure 8.3: Exemplary materials support
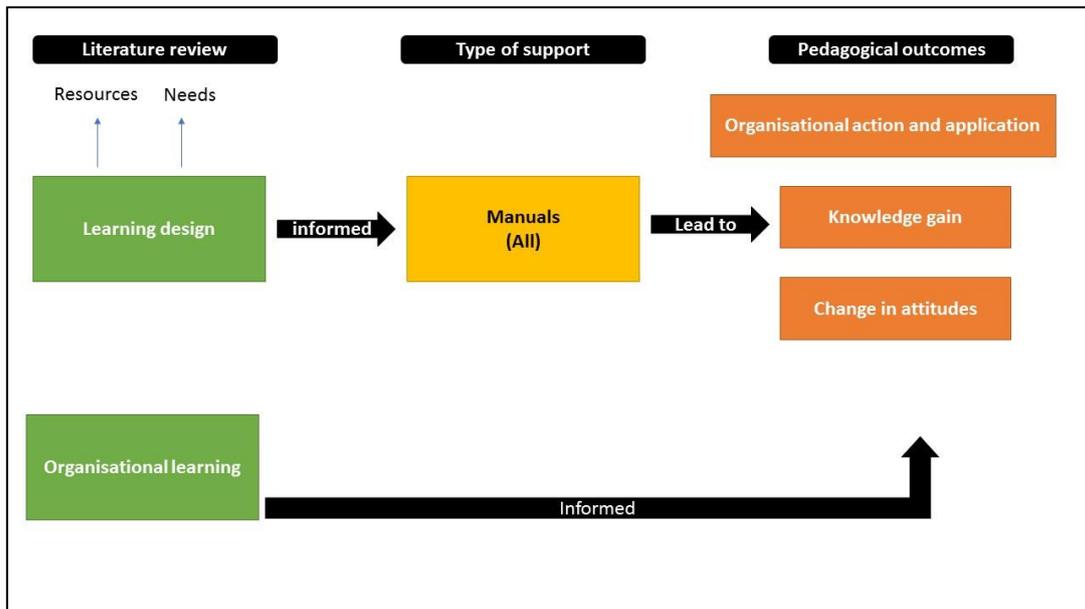

Figure 8.4: Manual support
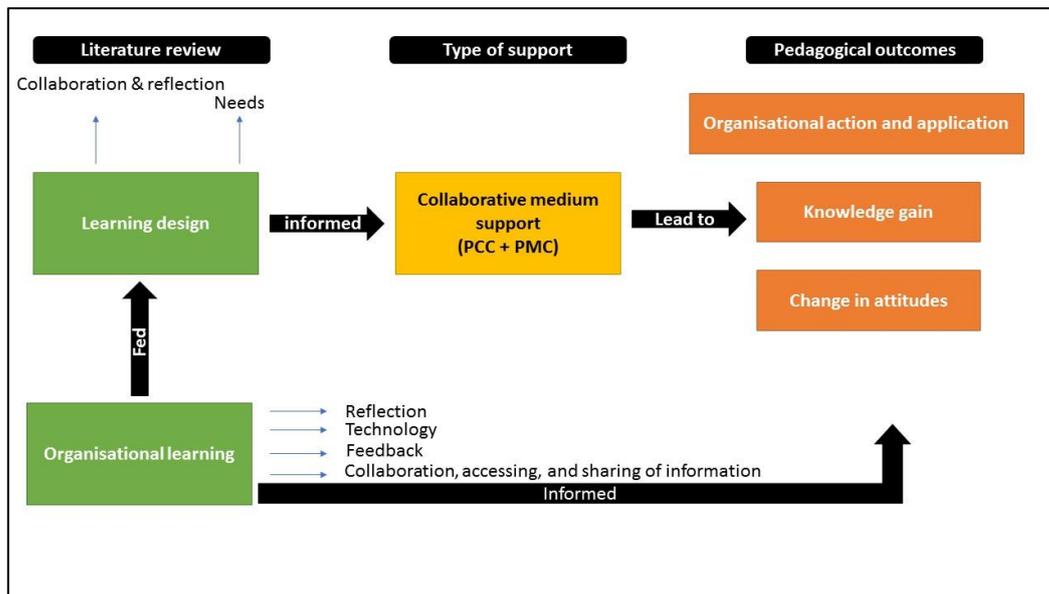
Figure 8.5: Collaborative medium support

16. Highlighting an overall picture (see Figure 8.6) of the PDP that includes the support elements and influencers that lead to different types of pedagogical outcomes. This picture shows that it is not only the different types of support that should be available to lead to a successful PDP, but there are also positive influencers that should be taken into consideration leading to different types of pedagogic outcomes.
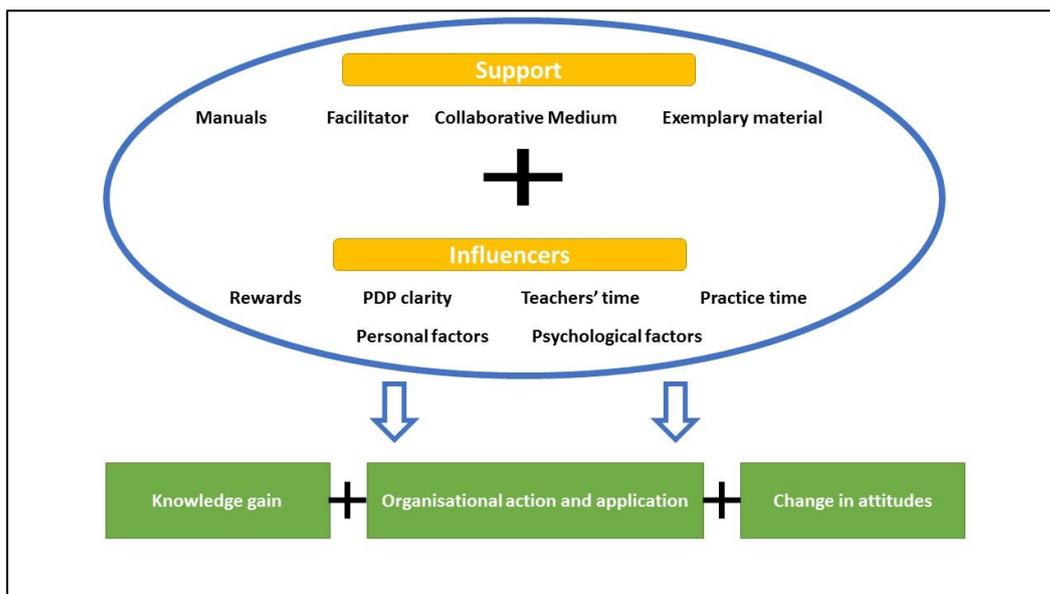

Figure 8.6: The overall picture

8.11- Limitations

Firstly, this DBR study is qualitative (the data gathering is qualitative, but the data presentation is in part quantitative) using qualitative data collection methods to answer the sub-research questions. The researcher/facilitator is aware of the limitations of this approach and its critique. Bryman (2012) listed some of them as: 1) subjectivity; 2) difficulty to replicate; 3) problem of generalisation; and 4) lack of transparency. Subjectivity can occur because the findings can be affected by the researcher/facilitator's unsystematic focus on data generation. Difficulty to replicate occurs because in qualitative research, the researcher is the main instrument of data collection, so the findings may differ from one researcher to another, since each researcher may choose what to focus on during data collection. Problems of generalisation occur because of small sample size, so the scope of the findings will be restricted to the target context and generalising findings to other settings needs to be considered by the user, rather than by the researcher reporting these case findings. Lack of transparency occurs when there is no clear process of how the researcher reached the study's conclusion. The researcher/facilitator attempted to address all these limitations by giving a very clear and detailed description of the study in the design approach, data collection, data analysis, participants' recruitment, and the design of the PDP. Moreover, teachers' different perceptions were highlighted in addition to using descriptive statistical analysis to triangulate data for increasing study validity and reliability.

Secondly, there are other possible limitations that could be related to worldviews. Philosophical worldviews such as post-positivism, constructivism, and pragmatism influence the practice of research (Creswell, 2014). For example, post-positivism focuses on theory verification and constructivism focuses on theory generation, but pragmatism focuses on solving real-world practice problems. In this study, the researcher/facilitator is focusing on

solving a problem in a certain context and the design and implementation of the intervention mainly took teachers' needs into consideration to solve the problem. That might affect the outcomes of the study, unlike a researcher who focuses on theory verification or theory generation.

Thirdly, the researcher/facilitator used one main theoretical framework for designing the intervention (PDP). However, the researcher/facilitator used the literature review and Passey's (2011) learning elements framework with Laurillard's conversational framework to supplement this and to guide the design.

Fourthly, the researcher/facilitator as an insider played three roles: researcher, practitioner, and technological support person. Accordingly, maintaining objectivity was a challenge, but the researcher/facilitator used certain quality criteria (refer to Table 5.4) to ensure as far as possible that the data were reliable.

Fifthly, the researcher/facilitator used a purposive sampling technique and that could lead to bias since participants already knew the researcher/facilitator as a colleague. To address this as far as possible, the researcher/facilitator collected data using more than one data collection method and used multiple levels of details to give the reader a detailed picture of teachers' perceptions and responses throughout the PDP (refer to the quality criteria in Table 5.4).

Sixthly, the researcher/facilitator used Google Slides as a technology tool for designing, developing, and implementing CSCL activities for teaching AFL. This tool might be supporting the Arabic language, but not other languages, so this might eventually affect the uses and outcomes for others.

Seventhly, the researcher/facilitator used different types of support elements guided by the theoretical framework and the literature review to enable AFL teachers to design, develop,

and implement CSCL activities. These support elements might be suitable for the target context and culture only. Since the researcher/facilitator is not aware of other cultures in the world, this might eventually affect the design, development, and implementation of the intervention (PDP).

Eighthly, Laurillard's (2002) conversational framework was used in this study in the way described, and while successful outcomes were produced, this does not guarantee that if it is used in other ways, the same outcomes will be produced. Accordingly, the researcher/facilitator is highlighting again that the outcomes of this study are limited to the target context only and cannot be simply generalised.

8.12- Recommended ideas for further research

Firstly, the researcher/facilitator believes that this study will resonate with researchers for building future research by extending the findings of the six sub-research questions that tackled: 1) teachers' perceptions towards the PDP; 2) the relationship between teachers' pedagogical outcomes and the different types of support provided; 3) the positive influencers and barriers that affect teachers throughout the PDP; 4) teachers' responses throughout the PDP; 5) students' responses towards the TEL activities from teachers' perspectives; and 6) the design principles of an effective implementation of the PDP. That could be achieved using again a DBR methodology, but in different contexts.

Secondly, the PDP (intervention) in this study can be used as a foundation to study the effectiveness of Laurillard's (2002) conversational framework in other contexts to see whether similar findings can be achieved or not. In addition, the number of DBR cycles can be increased in order to see how participants will react over a longer period of time and to see which type of support learners will still depend on and which they will ignore.

Thirdly, it will also be beneficial if this PDP is applied with teachers of different levels of expertise (novice, intermediate, and facilitator) in technology to see how the outcomes will differ and how effective the framework will be.

Fourthly, different research methodologies could also be applied to see how the outcomes will differ by looking at different perspectives and therefore be able to see the wider picture.

Fifthly, the PDP could also be applied with different age groups of teachers to see how and whether they will respond differently to the support elements provided in each cycle of Laurillard's (2002) conversational framework.

Sixthly, it will be beneficial to apply the PDP, but with a larger number of participants in order to explore the limitations of Laurillard's (2002) conversational framework further.

Seventhly, the PDP could also be applied using different technology tools, unlike Google Slides, for designing, developing, and implementing TEL activities to see whether teachers' outcomes will differ or not. Google Slides as a tool enabled teachers to apply the internalisation and externalisation learning elements of Passey's (2011) framework in the design, development, and implementation of the CSCL activities, so more technology tools need to be explored to see their benefits and limitations in those terms.

8.13- Final reflection

It is worth highlighting in this section how the participants reacted after finishing cycle 2 of the PDP and finalising the study.

Firstly, after finalising the study, there was a break given by the University after the end of the semester, so the researcher/facilitator and participants did not meet for around a month and a half. However, after starting the following semester, teachers asked about conducting a

one-day workshop to show other teachers who did not contribute in the study what they had accomplished throughout the PDP by: 1) presenting their different designed, developed, and implemented CSCL activities; 2) showing them students' different responses to the CSCL activities; 3) highlighting the benefits they gained from going through the PDP; 4) talking about the feelings they encountered at the start, the middle, and the end of the PDP; 5) pinpointing the benefits behind using Google Slides as a tool for designing, developing, and implementing different kinds of CSCL activities for teaching AFL either inside or outside the class; 6) saying how confident they became after going through the PDP because they were able to integrate technology in their AFL teaching for the first time; and 7) thanking the CALL director (researcher/facilitator) for believing in them as she helped them to explore themselves further and make them feel that they could break the fear behind incorporating technology in their AFL teaching.

Secondly, throughout the semesters that followed this above-mentioned workshop that they conducted themselves, they continued to contact the CALL director (researcher/facilitator) for: 1) sharing their new designed, developed, and implemented CSCL activities; 2) asking for her advice in order to enhance their activities further; 3) talking about how their colleagues gave them new ideas and different pieces of advice for enhancing their activities further; and 4) asking for new video and/or document manuals to help them throughout their practice.

From these later responses, the researcher/facilitator can conclude that the PDP enabled and motivated teachers to design, develop, and implement CSCL activities further even after the study was finalised. In addition, it can be concluded that the support elements provided, such as the researcher/facilitator face-to-face weekly meetings with each teacher, video/document manuals, exemplary materials, and use of the collaborative medium, sustained the objective of the PDP.

8.14- Summary

This chapter presented in detail how the four contextual problems were tackled in the PDP using Laurillard's (2002) conversational framework and the literature review. In addition, it highlighted the six sub-research questions related to a summary of findings and the conclusions that can be inferred from each. Moreover, it showed the benefits and limitations of Laurillard's (2002) conversational framework with regard to theoretical implications in addition to the practical implications that can benefit instructional designers and researchers. Additionally, this chapter stated clearly the limitations of this study, in addition to recommendations for future research.

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