A MOBILE TEACHER PROFESSIONAL DEVELOPMENT COURSE ON
DIGITAL GAME-ENHANCED LANGUAGE LEARNING

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF SOCIAL SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

EMRAH BAKİ BAŞOĞLU

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY
IN
THE DEPARTMENT OF EDUCATIONAL SCIENCES, CURRICULUM AND
INSTRUCTION

APRIL 2022

Approval of the thesis:

A MOBILE TEACHER PROFESSIONAL DEVELOPMENT COURSE ON DIGITAL GAME-ENHANCED LANGUAGE LEARNING

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ABSTRACT

A MOBILE TEACHER PROFESSIONAL DEVELOPMENT COURSE ON DIGITAL GAME-ENHANCED LANGUAGE LEARNING

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Supervisor: Assist. Prof. Dr. Nur AKKUŞ ÇAKIR

April 2022, 390 pages

The purpose of this design and development research study was to develop a mobile teacher professional development (mTPD) course on Digital Game-Enhanced Language Learning (DGELL) and to evaluate this course by investigating language instructors' perceptions and application of knowledge about DGELL. The mTPD course was designed leveraging mobile learning to offer ultimate accessibility and flexibility to the teachers and it was developed in three iterative cycles with 44 English language instructors. Data were gathered through course evaluation questionnaire, perception questionnaire, achievement test, lesson plan assessment and interviews. The findings revealed that perceptions of participants about the content, usability, and effectiveness of the mTPD course changed positively as the program was being redeveloped in each iterative cycle. The findings also showed that participants' perceptions regarding the learning opportunities of using digital games in language learning showed a positive change after they completed the course. Additionally, participants' perceptions about their skills to use digital games in their classroom changed positively after the course. Lastly, the mTPD course made a positive impact

on the knowledge of participants on DGELL and their application of this knowledge in all cycles. Therefore, it was concluded that this mTPD course can give language teachers an opportunity to step out of their comfort zone and develop skills to integrate digital games into their classrooms. Additionally, the situation-specific design steps emerged from this study might provide guidance and support for researchers to design professional development programs with mobile learning experiences and improve existing ones.

Keywords: design and development research, digital game-enhanced language learning, mobile teacher professional development

ÖZ

DİJİTAL OYUNLA ZENGİNLEŞTİRİLMİŞ DİL ÖĞRENİMİ ÜZERİNE BİR MOBİL ÖĞRETMEN MESLEKİ GELİŞİM DERSİ

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Nisan 2022, 390 sayfa

Bu tasarım ve geliştirme çalışmasının amacı, dijital oyunla zenginleştirilmiş dil öğrenimi üzerine bir mobil öğretmen mesleki gelişim dersi geliştirmek ve bu dersi, yabancı dil öğretmenlerinin mobil öğretmen mesleki gelişim dersine ilişkin algılarını ve öğrendikleri bilgileri uygulamada nasıl kullandıklarını inceleyerek değerlendirmektir. Bu çalışmada tasarım ve geliştirme araştırma yöntemi kullanılmıştır. Mobil öğretmen mesleki gelişim dersi, öğretmenlere en üst düzeyde erişilebilirlik ve esneklik sunmak için mobil öğrenme yaklaşımıyla tasarlanmış ve 44 İngilizce öğretmeniyle üç yinelemeli döngüde geliştirilmiştir. Çalışmada veriler program değerlendirme anketi, algı anketi, başarı testi, ders planı değerlendirmesi ve görüşmeler yoluyla toplanmıştır. Bulgular, mobil öğretmen mesleki gelişim dersinin içeriği, kullanılabilirliği ve etkililiği hakkındaki katılımcıların algılarının, program her yinelemeli döngüde yeniden geliştirilirken olumlu yönde değiştiğini ortaya koymuştur. Bulgular ayrıca, katılımcıların dijital oyunları dil öğreniminde kullanmanın yarattığı öğrenme fırsatlarına ilişkin algılarının, dersi tamamladıktan

sonra olumlu yönde değiştiğini göstermiştir. Ayrıca katılımcıların dijital oyunları sınıflarında kullanabilme becerilerine ilişkin algıları ders sonrasında olumlu yönde değişmiştir. Son olarak, mobil öğretmen mesleki gelişim dersi, katılımcıların tüm döngülerde dijital oyunla zenginleştirilmiş dil öğrenimi hakkındaki bilgileri ve bu bilgileri uygulamada kullanabilmeleri üzerinde olumlu bir etki yapmıştır. Bu nedenle, bu mobil öğretmen mesleki gelişim dersinin yabancı dil öğretmenlerine konfor alanlarının dışına çıkma ve dijital oyunları sınıflarında kullanabilmek için gereken becerileri edinebilme fırsatı verebileceği sonucuna varıldı. Ek olarak, bu çalışmadan ortaya çıkan duruma özel tasarım adımları, araştırmacılara mobil öğrenme deneyimleri ile mesleki gelişim programları tasarlamaları ve mevcut olanları iyileştirmeleri için rehberlik ve destek sağlayabilir.

Anahtar Kelimeler: tasarım ve geliştirme araştırması, dijital oyunla zenginleştirilmiş dil öğrenimi, mobil öğretmen mesleki gelişimi

ACKNOWLEDGMENTS

I would like to thank the following people, without whom I would not have been able to complete this research, and without whom I would not have made it through my PhD degree!

My esteemed supervisor Asst. Prof. Dr. Nur Akkuş-Çakır whose guidance, advice, criticism, encouragements, and insight throughout the research steered me through my research.

The members of my thesis monitoring and defense committee; Prof. Dr. Cennet Engin-Demir, Prof. Dr. Soner Yıldırım, Prof. Dr. Diler Öner and Prof. Dr. Cem Balçıkanlı who gave me brilliant suggestions and comments about my research.

My former supervisor Assoc. Prof. Dr. Evrim Baran, who continuously provided me encouragement and support during her time in METU.

My dear friend, Asst. Prof. Dr. Ayşegül Köktürk, who helped me throughout the statistical analysis phases of this research.

The language teachers and instructors who enthusiastically volunteered to take part in this research and invested their valuable time to their coursework.

And my biggest thanks to my mother, father and sister who have always shown me their unconditional love and support.

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LIST OF ABBREVIATIONS

CPD	Continuous Professional Development
DDR	Design and Development Research
DGBLL	Digital Game-Based Language Learning
DGELL	Digital Game-Enhanced Language Learning
ICT	Internet Communication Technologies
MoNE	Ministry of National Education
MOOCs	Massive Open Online Courses
mTPD	Mobile Teacher Professional Development
PCaRD	Play Curricular activities Reflection Discussion
PD	Professional Development
TPACK	Technological Pedagogical Content Knowledge
TPD	Teacher Professional Development

CHAPTER 1

INTRODUCTION

This chapter presents a background to the study highlighting the rationale behind this research and its significance, as well as providing definitions of the terms used through the manuscript.

1.1 Background of the Study

The transformation of foreign language education in Turkey in recent years has brought out several new ideas into practice. In 2023 Educational Vision Document announced by The Ministry of Turkish National Education (MoNE), it is acknowledged that teacher qualifications and competences in foreign language education will be enhanced by offering remote, and in-person trainings to language teachers based on the philosophy of lifelong learning. Additionally, opportunities will be provided for teachers to master language teaching methodology as well as to use digital resources. In terms of student learning, foreign language education will be handled with a student-centered approach, using methodologies appropriate to the cognitive levels of the students (2023 Eğitim Vizyonu, 2018). As it can be seen from the vision document, much more attention is directed on how technology can be used to support changes in teaching and transformation in learning.

Nowadays students are born as digital natives and their whole lives are full of computers, video games, cameras, mobile phones and other technological gaming devices (Prensky, 2003). With the technological progress and almost everyone owning a computer or smartphone, 'commercial off-the-shelf' digital games have ceased to appeal to a small community and become a global phenomenon played by millions of people in many countries around the world. A new community called 'gamers' has

emerged (Walsh, 2010), which has created a new multilingual and transcultural global reality.

The debate as to whether commercial off-the-shelf games are good or bad for people has been a hot topic for several years and there are controversial propositions about their effect on learning (Ebrahimzadeh & Alavi, 2017a; Gee, 2003; Reinhardt, 2013; Sundqvist & Sylvén, 2014; Sykes & Reinhardt, 2013). According to Reinhardt (2013), some researchers are skeptical of these games because the addictive, violent and lonely features of games can do more harm than good and games appeal to a certain audience and would not appeal to everyone. He also mentions that some people think play and learning are two different phenomena, and that learning can take place through work, which is the opposite of play.

However, many of these criticisms result from a lack of understanding of the nature of the games. Considering the industrial and conservative mindset of the 19th century, characterizing the game as non-productive and claiming that it does not benefit learning doesn't comply with today's realities. With continuing developments in digital gaming industry, the global gaming market grew 13% from 2019 to 2020 with a profit of $159.3 billion and it is estimated to reach $180.1 billion in 2021 (Kataria & Chirputkar, 2020).

The fact that young people spend considerable time to play commercial digital games has attracted the attention of researchers and several studies have been conducted until today to use this potential in language learning (Ali et al., 2018; Bolliger et al., 2015; Cardoso et al., 2017; Ebrahimzadeh & Alavi, 2017a; Eshelman, 2017; Kettemann, 1995; Loiseau et al., 2016; Pitarch, 2018; Scholz, 2017; Sundqvist, 2009; Thorne & Watters, 2013; Y. L. Tsai & Tsai, 2018). This potential of games has created new perspectives that foreign language teachers can use in language teaching. However, the effectiveness of commercial digital games in language learning is strongly tied to the quality of the instructional design, which makes language teachers' competency in integrating games into the curriculum essential. To increase the impact of digital games on foreign language learning and create more productive learning environments, it is very important to inform foreign language teachers about the digital

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gaming phenomenon and to raise awareness about its potential. Foreign language teachers need to acknowledge that their students are now growing in a post-industrial world, in an environment where digital literacy develops day by day, and they must strive to improve themselves. However, when the research studies focusing on the use of commercial off-the-shelf games in language learning were reviewed, it was seen that there is limited research previously conducted in Turkey (Yaşar, 2018).

Studies conducted in teacher education assert that the most effective way to bring an added value to teacher efficacy is to create effective professional development (PD) chances for the teachers (Kempen & Steyn, 2015; Lieberman & Mace, 2010; Opfer & Pedder, 2011). Language teachers are expected to devote 25% of their time in professional life to learning and cooperation (Council, 2001) and they need continuous professional development (CPD) opportunities to acquaint themselves with the most recent methodological innovations such as Digital Game-Enhanced Language Learning (DGELL). Over the last 5 years, language teachers' professional development has become one of the hot topics in educational research and various studies can be found in the world on language teachers' professional development (Abbasi, 2015; Ariza & Poole, 2018; Asmari, 2016; Babinski et al., 2018; Giraldo, 2014; Ortaçtepe & Akyel, 2015; Qi & Wang, 2018; Santos, 2016; Sierra Piedrahíta, 2018; Xerri & Campbell, 2016). Regarding the professional development of language instructors in the Turkish university context, a small number of research has been conducted on the needs and opinions of language instructors on their PD needs and the PD practices they attended. These studies investigated the ICT competence of language instructors and their professional needs in ICT (Ardıç & Çiftçi, 2019; British Council & TEPAV, 2015), language instructors' burnout and their participation on PD activities (Kulavuz-Onal & Tatar, 2017), successful professional development activities in which language instructors were involved (Sarac, 2015), and language instructors' use and attitudes towards ICT (Cobanoglu & Yucel, 2017).

Even though there are many PD opportunities available in theory for the EFL instructors (Mitton-Kukner & Akyuz, 2012), other than the very few PD trainings that are held during the mid-term breaks, language instructors cannot continuously find meaningful PD opportunities due to several reasons (Elliott, 2017). Teachers have

problems in participating in PD practices because of their daily heavy schedule, which puts hidden walls between each other and prevents them from forming a collaborative professional learning environment (Casteel & Ballantyne, 2010; Mockler & Groundwater-Smith, 2009). Additionally, teachers are mobile. They don't have much opportunity to sit at their desks and have an in-person or online PD opportunity in a collaborative setting. Their work environments also prevent connectedness, which causes them to engage in learning in distinct and detached places in different times (Aubusson et al., 2009). They move between classrooms and locate in one place or another.

In addition to these challenges language instructors face, the likely impact of Covid-19 pandemic will have important long-term consequences on teachers' continuous professional development opportunities. With the risk of more precautions to minimize the pandemic threat as well as a need for an alternative plan to be prepared for such an unforeseen disruption in education, researchers should focus on more teacher professional development programs that are developed on remote pedagogies. It is foreseen that teachers will be offered more and more online professional development trainings in the future and this will be an integral part of new post-Covid era (Bragg et al., 2021).

The use of mobile technologies in teacher development is increasing all over the world and they have begun to transform the traditional learning and teaching methods into anytime and anywhere learning opportunities. In the last 10 years, studies on mobile teachers' professional development (mTPD) have begun to provide teachers with resources and instruction that can develop their pedagogical content knowledge in language teaching (Beauchamp et al., 2015; Burns, 2015; Ekanayake & Wishart, 2015; Gunter & Reeves, 2017; Jung, 2015; Marques & Pombo, 2021; Parmigiani et al., 2019; Saldana Jr., 2015). In order to offer more teacher professional development (TPD) opportunities for the language teachers, these kinds of new and pervasive technologies have begun to take place as an alternative to traditional ways of TPD (Campbell et al., 2013). However, Saiful (2020) asserted that the role of mobile technology in education is still not very clear, and there aren't enough examples of mobile teacher development practices to allow for reliable analysis. Furthermore, in spite of the growing interest

into mTPD in the world, only a few research studies in Turkey have focused on the PD of language teachers on mobile platforms (Baran, 2014; Keskin & Kuzu, 2015).

Integrating innovative digital environments such as mobile learning into TPD can give meaningful perspectives to the instructional framework of learning and teaching processes. However, mobile learning programs can cause fear and anxiety in teachers who have no prior experience with mobile courses (Dunst & Raab, 2010; Yoder, 2001). In that sense, experiencing a mobile learning program designed in poor quality has a worse impact than having no mobile learning experience. Teachers' prejudice to such programs can be reduced if they are effectively designed to provide TPD opportunities for teachers' needs (Bereiter, 2002; Garet et al., 2001). It should not be forgotten that professional development of language teachers can be accomplished by using appropriate technology and learning scenarios within well-designed programs (Borg, 2003; Wang et al., 2003). However, after reviewing the literature, it was understood that little is known about best practices for the design and implementation of mTPD programs despite the rapid consumption of mobile resources (Baran, 2014; Borko, 2004; Dede et al., 2009; Fisher et al., 2010; Hubbard, 2008; Kearney et al., 2012; Liaupsin, 2002; Lieberman & Mace, 2010; Naismith et al., 2004; Royle et al., 2014).

In that manner, the professional development course on Digital Game-Enhanced Language Learning has intended to provide the language instructors with an innovative method to integrate digital commercial 'off-the-shelf' games into their teaching and a mobile teacher professional development (mTPD) course was designed and developed to fulfill the needs of the language teachers. This dissertation aims to explore the design, development, implementation, and evaluation phases of the mTPD course on Digital Game-Enhanced Language Learning.

1.2 Purpose of the Study

The purpose of this study was as follows; (1) to develop a mobile teacher professional development course on Digital Game-Enhanced Language Learning and (2) to evaluate this course by investigating language instructors' perceptions about the mTPD course and their perceptions and knowledge about DGELL.

In this regard, the research questions are;

1. What are the perceptions of the language instructors towards the mobile teacher professional development course on Digital Game-Enhanced Language Learning?

    1.1. What are the perceptions of the language instructors about the content of the mobile teacher professional development course on Digital Game-Enhanced Language Learning?

    1.2. What are the perceptions of the language instructors about the usability of the mobile teacher professional development course on Digital Game-Enhanced Language Learning?

    1.3. What are the perceptions of the language instructors about the effectiveness of the mobile teacher professional development course on Digital Game-Enhanced Language Learning?

2. To what extent do the language instructors' perceptions about the use of digital games in language learning change after the implementation of mTPD course?

3. To what extent do the language instructors' knowledge of DGELL change at the end of mTPD course?

1.3 Significance of the Study

There have been significant studies on the contribution of commercial off-the-shelf games to language learning all around the world (Bytheway, 2015; Chen et al., 2012; Chen & Yang, 2013; Chik, 2011a; De Grove et al., 2013, 2011; Ebrahimzadeh & Alavi, 2017b; Enayat & Haghighatpasand, 2019; Godwin-Jones, 2016; Gorham &

Gorham, 2016; Loiseau et al., 2016; Lombardi, 2012; Meyer & Sørensen, 2009; Sundqvist, 2019; Sykes, 2018; Xu et al., 2019). The related research in the literature shows that students enjoy learning foreign languages by playing games and playing commercial games creates a meaningful context for language use which encourages language learners to interact and communicate in various skills. DGELL has the potential to offer new perspectives in foreign language learning (Sykes & Reinhardt, 2013). Overall, this study aims to enable participant language instructors to elicit information about DGELL, which proposes that using commercial games in foreign language learning can be an effective way and learning environments are not limited to classroom settings and authentic learning context can be created both in the real or virtual omni-environments (Lan et al., 2018).

Secondly, it is important to explore teachers' personal experiences and their perceptions of digital games as pedagogical tools and professional development (Chik, 2011b). The results of this study are expected to provide new insights about the perceptions of language teachers towards Digital Game-Enhanced Language Learning. These insights can help researchers design quality TPD programs on digital games in language learning.

The mTPD course on DGELL may also be used as a learning source for language instructors and other practitioners in their professional development. Consent from the content owners will be obtained and the course will be available to all language teachers free of charge. By the help of the mTPD program, language teachers may be able to learn how to include commercial off-the-shelf games in their teaching practices to motivate language learners and engage them in a more entertaining learning environment which goes along with their learning styles.

Recent changes in technology has removed the classroom walls in the teachers' own PD environments, and facilitated professional learning anytime and anywhere, even while teaching in the classroom (Aubusson et al., 2009). Regarding teachers' need for continuous professional development, it can be said that this study sets an example about the potential for PD opportunities for language teachers in remote areas, meeting their continuous PD needs, while at the same time catering to geographical, monetary,

and time constraints. The empirical findings from this study can be used to offer insight into mTPD program developments, affordances, and limitations. Additionally, other researchers who are challenged by similar design and development projects can benefit from the conclusions of the study.

1.4 Definition of Terms

Commercial Off-The-Shelf (COTS) Games: COTS games are different from educational games, which are known as serious games. COTS games are the games that are specifically made for entertainment purposes and they can be played with a game console (i.e. Playstation) or computer (Chen & Hsu, 2020).

Digital Game-Based Language Learning (DGBLL): Digital Game-Based Language Learning refers to the use of games and game-inclusive synthetic immersive environments that are designed intentionally for L2 learning and pedagogy (Sykes & Reinhardt, 2013).

Digital Game-Enhanced Language Learning (DGELL): Digital Game-Enhanced Language Learning (DGELL) refers to the use of commercial and non-educational digital games in the field of foreign language teaching (Sykes & Reinhardt, 2013).

Perception: Perceptions are the mental images of language instructors about a given topic shaped by their background and experiences and influence their behavior.

Usability: Usability refers to how easy the mTPD course is to use and how easily the participants can accomplish a task, such as sharing an assignment or navigating in different modules of the course.

Teachers' Professional Development (TPD): TPD is the professional growth a teacher gains in consequence of obtaining experience and inspecting their teaching systematically (Glatthorn, 1995).

Mobile Teachers' Professional Development (mTPD): mTPD can be defined as any TPD activities delivered online on mobile devices such as smartphones, laptops, and tablets.

CHAPTER 2

LITERATURE REVIEW

This study aims to design, develop, and evaluate a mTPD course on Digital Game-Enhanced Language Learning. Therefore, this chapter presents a review of the relevant literature that focuses on using digital games in language learning, professional development of language teachers in online and mobile platforms, instructional design models for online instruction, TPD program evaluation and Design and Development Research design.

2.1 Using Digital Games in Language Learning

Especially in the last 5 years, theoretical and empirical research on the relationship between digital gaming and language learning have increased (Ali et al., 2018; Blume, 2019; Hung et al., 2018; Schlasberg, 2020; Scholz, 2017; Sundqvist, 2019; Tsai & Tsai, 2018; Xu et al., 2019; Yaşar, 2018). Sykes (2018) has collected the benefits of this kind of research under the following topics:

- building learning communities
- having the opportunity to learn interculturally
- creating a variety of written and verbal discourse
- accessing authentic texts
- finding opportunities for socio-cognitive process of learning and language socialization
- learning vocabulary

According to Griffiths (2003), digital games can be used to promote social and organizational development of children with attention and impulsive disorder. It also

creates authentic learning environments for students and enables situated learning to be incorporated into the learning process (Foster & Shah, 2011; Herrington & Oliver, 2000). Since off-the-shelf, non-educational commercial games are effective tools for motivation, engagement and flow, they enable students to develop in history, communication and foreign language (Peterson, 2013). Devlin (2011) also mentioned about different characteristics of digital games as a language learning tool which is immersive, appealing, multi-modal, rewarding fail and search, supporting active learning, giving immediate feedback, supporting different degrees of challenge, scaffolding learning, and motivating players to persist.

To understand the potential of digital games in language learning, it is essential to go through the previous studies conducted on this topic. For example, in a study conducted by Sundqvist and Sylvén (2014), there was a correlation between self-assessed L2 English proficiency, gender and digital gaming. According to the results of the study, the motivation for learning English was higher among the frequent gamers than those who did not play. In another study conducted by the same researchers (Sundqvist & Sylvén, 2012), frequent gamers showed higher rates of listening, reading and vocabulary than non-frequent gamers.

In another study, the perceptions of college students about the use of games in language learning were investigated (Ebrahimzadeh & Alavi, 2017a). For this purpose, Sid Meier's Pirates and Sam and Max games were played by the students and they were asked to write reflection papers. The findings of the research showed that games contribute to foreign language learning especially in listening and reading skills. Another important finding of this study is the students' opinions on how teachers can support learning through video games. The students stated that it would be better for teachers to prepare activity task sheets on topics that are expected to be learned in game-based language learning environments. Other significant findings of the study showed that students shared their reflection in the classroom, used a dictionary during the game when they needed it, and there was not too much teacher intervention that can prevent enjoyment.

Besides the benefits and potential of digital games on language learning, there are also some certain aspects of digital games that can receive negative criticism. Teachers should be very careful when integrating digital games into the learning process. One of the main challenges is the difficulty in establishing a standard assessment tool for the assessment of learning outcomes. Therefore, it is important that teachers are trained in assessment and evaluation of digital games so that they can see if instructional objectives of the digital games have been achieved (Baek, 2008).

Another challenge is that digital games can cause isolation and immobilization among students (He et al., 2010). According to He et al. (2010), students who play addictive digital games for a long time might have obesity and growing problems. Additionally, students who spend a long time playing digital games may break away from real life and experience problems in developing their social skills. In order to avoid these problems, learner habits should be continuously monitored during the whole process (Kneer et al., 2014).

In addition to these problems, the most prominent problem with the use of digital games in language learning is the lack of professional development opportunities for pre-service and in-service teachers (Denham, 2016). A study in the United States showed that only 17 percent of teachers had the opportunity to develop professionally in the field of DGBLL (Takeuchi & Vaala, 2014). According to Van Eck (2015), the DGBLL community has limited opportunities for professional development as a result of the lack of guidance on how to implement this method for teachers. In addition to that, Denham (2019) stated that empirically validated DGBLL pedagogical models are scarce, as well as the lack of professional development of DGBLL, which may cause difficulties in adapting digital games to the teaching context.

2.1.1 Digital Game-Enhanced Language Learning

The rapid development of resourceful technological devices designed for communicative and entertaining purposes is apt to expand the possibilities for language learning (Chik, 2011a). Because of their potential to enhance the language

learning experience both inside and outside the classroom, commercial off-the-shelf (COTS) games have received attention in recent years. (Sundqvist, 2019). For some people, COTS games are only a way to avoid the stress of the real world, while for some other people, these games can give way to new opportunities by letting the learners engage in a meaningful learning context while playing games (Reinhardt, 2013).

In order to reveal the theoretical foundations underlying the pedagogical practices of COTS games in language learning, Sykes and Reinhardt (2013) proposed Digital Game-Enhanced Language Learning (DGELL), which refers to the use of commercial and non-educational digital games in the field of foreign language learning. To understand the pedagogical practices and to design formal DGELL environments for the language learners, the first thing to do is to understand how game enhanced language learning happens in language learning settings (Reinhardt, 2013).

Many recent studies have shown that DGELL has a significant potential (Ali et al., 2018; Eshelman, 2017; Loiseau et al., 2016; Sundqvist, 2019) and different aspects of DGELL have been investigated in the literature. For example, research provided some insights about the opportunities that digital games provide for contextualized learning (Godwin-Jones, 2016; Lombardi, 2012; Peterson, 2013; Piirainen-Marsh & Tainio, 2009; Thorne, 2008). Thorne (2008), who observed players playing World of Warcraft, discovered that the game was very effective in increasing intercultural awareness. Similarly, Piirainen-Marsh and Tainio (2009) stated that in the Final Fantasy game they examined, the players created social opportunities and created a learning environment while they were making their characters speak by using repetition and mimicry. Godwin-Jones (2016) investigated the connection between augmented/virtual reality and second language acquisition and he explained that games such as Pokemon Go and Oculus Rift give the language learners opportunities to engage in a rich linguistic and cultural game environment. In another study, Jensen (2017) studied with 107 Danish young English language learners to investigate their use of Extramural English activities including gaming, listening to music, reading, watching TV, etc. The study showed that gaming was one of the favorite activities of both boys and girls since they were engaged in gaming only for entertainment. While

playing games, learners learned by doing and they had authentic experiences which helped them give meaning to the input they were exposed to in the game.

Research on DGELL also suggests that COTS games help language learners learn and master language skills, such as listening (Chen & Huang, 2010; Chen & Yang, 2013; Hu & Chang, 2007) and reading (Chen & Huang, 2010; Chen & Yang, 2013). Chen and Huang (2010) examined Taiwanese EFL college students' perceptions of the potentials of COTS games for language learning after playing two games, Sid Meier's Pirates and Telltale Sam and Max. Playing Sam and Max, language learners said that they were able to improve their listening skills and expand their vocabulary due to different speech styles and rich vocabulary. They also stated that the other game, Sid Meier's Pirates enhanced their reading skills since they were able to see the subtitles of character dialogues. In another study, Chen and Yang (2013) investigated the effects of a COTS game on language learners' learning. Participants were 35 college freshman students, and they played an English adventure game, BONE. At the end of the study, language learners stated that the game helped them improve their listening and reading skills, as well as their vocabulary knowledge.

Several studies show that COTS games can benefit language learners in their vocabulary learning (Bytheway, 2015; Chen & Yang, 2013; Enayat & Haghighatpasand, 2019; Franciosi et al., 2015; Hitosugi et al., 2014; Reinhardt, 2013; Schlasberg, 2020). Generally, students have difficulty to keep their concentration on vocabulary learning process and motivation plays a crucial factor in this situation (Nation, 2001). In that case, digital games play an important role to increase learners' concentration to learn vocabulary (Tsai & Tsai, 2018). Enayat and Haghighatpasand (2019) investigated the effect of a COTS game, The Secret Monkey Island, on 30 students' vocabulary recall. They concluded that students who played the game outperformed the students who didn't play the game in the vocabulary test. Moreover, students who played the game expressed positive perceptions and reported that playing game helped them learn vocabulary better. Bytheway (2015) conducted a study examining the in-game culture of a massively multiplayer online role-playing game (MMORPG) on language learners' vocabulary learning strategies and concluded that students purposefully used vocabulary learning strategies in MMORPGs to control

their learning autonomously. In another study, Reinhardt (2013) stated that Sims, one of the most popular simulation games, is considered to be one of the most appropriate games for DGELL as the game content available in the Sims can be blended appropriately with traditional foreign language learning curricula. Especially for students who are at the basic level of language learning, the words and phrases of family, home, dress or restaurant in simulation games may be useful, but for more advanced students, instructional goals should include more critical and analytical awareness (Reinhardt, 2013). In order to see if COTS games contribute to vocabulary learning, learning can be made meaningful by determining whether there are sufficient audiovisual and textual clues that students can try and learn in the game to see (De Grove et al., 2013). For example, in a game called Defense of the Ancients, players have to buy some items to make their avatars more powerful. However, the items that each avatar can receive are different, and the player must look at each item's thumbnail to find the one that suits his or her avatar and evaluate whether it fits to his or her avatar. All this is possible only by understanding the items, in other words, by learning the necessary vocabulary (Ebrahimzadeh & Alavi, 2017a).

2.1.2 Digital Game-Enhanced Language Learning vs. Digital Game-Based Language Learning

Game play has an important role in people's language development regardless of age (Lan et al., 2018) and researchers have been using this potential in language learning by conducting studies combining video games and education. Tsai and Fan (2013) have named the work in this field as game-based learning (GBL) and it can be defined as integrating games or digital gaming tools in learning process meaningfully to facilitate student learning by increasing learner motivation and engagement (Kapp, 2014; Prensky, 2003). Digital Game-Based Learning builds learning around two different types of digital games; serious games and commercial off-the-shelf (COTS) games (Becker, 2017). Serious games are the games designed for serious purposes such as formal education, while COTS games are designed for commercial purposes with pure entertainment (Van Eck, 2006). There are several studies in literature examining serious games (Alyaz & Genc, 2016; Chen & Hsu, 2020; De Grove et al., 2013; Loiseau et al., 2016; Meyer & Sørensen, 2009) and COTS games (De Grove et

al., 2013; Ebrahimzadeh & Alavi, 2017b; Schlasberg, 2020; Sundqvist, 2019; Yaşar, 2018) in language learning.

Later, however, Sykes and Reinhardt (2013) stated that it is necessary to distinguish between games made for language learning and commercial games, and called the learning formed by COTS games as Digital Game-Enhanced Language Learning (DGELL). DGELL refers to COTS and non-educational digital games that can be used in the field of foreign language teaching (Sykes & Reinhardt, 2013). The first thing to observe here is that game-based learning environments are intentionally designed for learning purposes, whereas game enhanced learning takes place outside of formal learning environments with COTS games, while formal game-enhanced foreign language teaching develops, and game-based language learning practices are developed (Hitosugi et al., 2014).

2.1.3 How to Integrate COTS Games into Classroom Learning

With continuous development and availability of digital devices in education, there is an increasing tendency to employ digital games to support student learning (Sykes, 2018). One of the major concerns that teachers may have is what type of digital games can be used for educational purposes in order to enhance student learning. In order to do so, teachers require technological pedagogical content knowledge (TPACK) to effectively implement digital games in their teaching (Duvall & Foster, 2015).

The TPACK framework is based on Shulman (1986) 's concept of pedagogical content knowledge (PCK) and adds technological knowledge to this model. The main purpose of the model is to provide guidelines for the effective use of technology in teaching and learning (Harris et al., 2009). The TPACK framework consists of three main forms of knowledge: technological knowledge (TK), pedagogical knowledge (PK) and content knowledge (CK) (Figure 2.1). Instead of using these concepts separately, it is more logical for teachers to interpret their intersecting points and form their practices accordingly. Technological pedagogical content knowledge (TPACK), which is one of the common points of the concepts, expresses the relationship between

technological knowledge, pedagogical knowledge and content knowledge in order to make learning easier for students (Duvall & Foster, 2015).
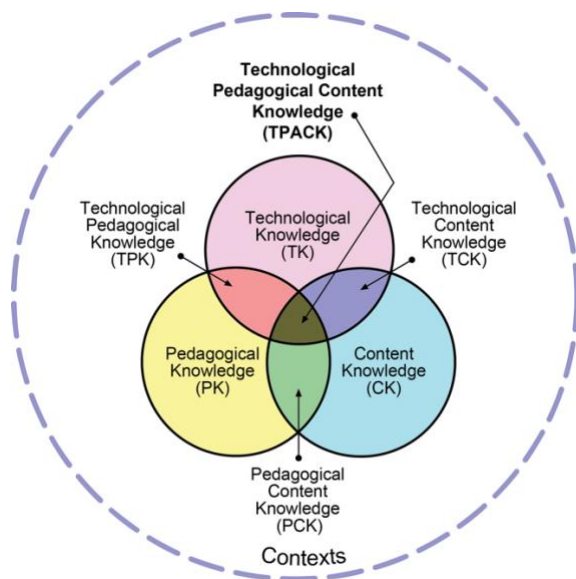
Figure 2.1. TPACK Model. Reprinted from TPACK Framework, by Mishra and Kohler, 2012, http://tpack.org. Reprinted with permission.

As studies in the TPACK field often include the internet, computers, and interactive whiteboard, it has been criticized that the TPACK framework guideline does not address teachers' professional development in learning with games (Hsu et al., 2015). To eliminate this problem, Hsu, Liang, Chai and Tsai (2013) proposed the Technological Pedagogical Content Knowledge-Games (TPACK-G) model. Developed from Mishra and Koehler (2006)'s TPACK framework, this model includes constructs of game knowledge (GK), game pedagogical knowledge (GPK), game content knowledge (GCK), and game pedagogical content knowledge (GPCK). GK refers to the knowledge of general use of computer games. GPK means using games with different pedagogical characteristics for teaching, regardless of content knowledge. GCK is the knowledge on how to use games to address content without considering pedagogy. Finally, GPCK is the knowledge that reveals how to use games to apply teaching methods for any learner group. In a study investigating teachers' TPACK perceptions (Chai et al., 2010), TK, PK and CK emerged as significant predictors of TPACK. In another study investigating teachers' perceptions of TPACK

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with games (Hsu et al., 2013), GPK and GPCK were identified as strong predictors after GK, which is the fundamental construct of this model in learning with games.

In order to integrate digital games into classroom activities effectively and ultimately encourage student motivation and increase classroom success, the learning process should be conducted with empirically tested game-based learning models accordingly (Foster & Shah, 2011). The Play, Curricular Activity, Reflection and Discussion (PCaRD) is a model that provides opportunities for students to increase their involvement into learning based on their interests. The model consists of four stages that provide teachers with a robust and effective structure to use digital games in the classroom (Figure 2.2) (Foster & Shah, 2015).
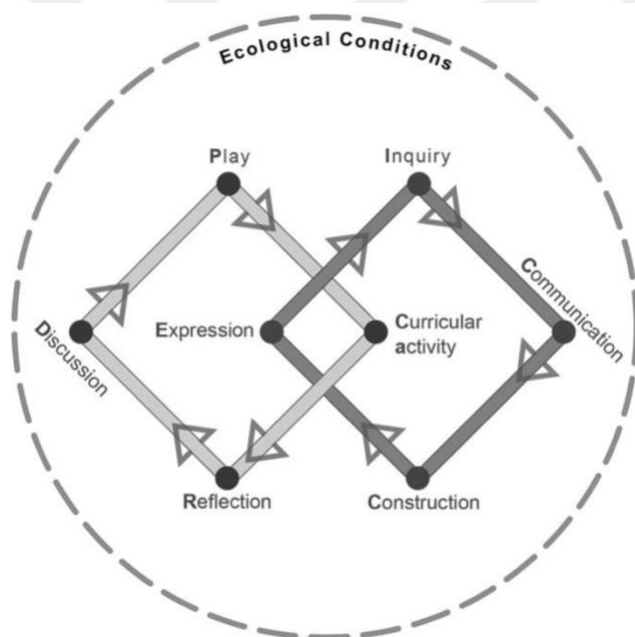
Figure 2. 2. Play Curricular activity Reflection Discussion (PCaRD) Model**.** Reprinted from "The Play Curricular Activity Reflection Discussion Model for Game-Based Learning" by Foster and Shah (2015), *Journal of Research on Technology in Education*, *47*(2), 71–88.

The aim of the first phase, play, is to provide students with sufficient time without any interruption to ensure that they are immersed in the natural learning environment. At

this stage, no instruction is given to the student, and they are encouraged to interact with other learners. The task of the teacher is to introduce the game, to observe the students who play the game and to evaluate the student interactions. In the Curricular activity stage, the activities are led by the teacher. The teacher takes a more active responsibility and prepares learning activities where students can relate to their experiences in playing. At this stage, it is important to provide the link between students' playing experience and content knowledge (Foster & Shah, 2015).

In the reflection phase, students are expected to think about the connection they have established between their gaming experiences and curricular activities and to present concrete examples. The teacher's function at this phase is to develop prompts and identify possible misconceptions by assessing students' responses. The misconceptions that emerge at this stage and the experiences that emerge in the two previous stages are discussed by teachers and students in the final stage of the discussion and the learning outcomes are concretely revealed (Foster & Shah, 2015).

2.2 Teacher Professional Development

There are different definitions to teacher professional development (TPD). For example, (Campbell et al., 2013) stated that TPD refers to delivering information to teachers so as to make a change in their teaching. Similarly, Mockler and Groundwater-Smith (2009) claimed that TPD is associated with staff development through direct instruction to improve teachers' skills via lectures or workshops but they also added that professional development is an active process in which teachers collaborate, create local knowledge and determine their own learning goals. Fishman (2016) defined TPD as learning activities that are linked to the teacher profession after initial certification. According to him, it is a process that teachers should continue throughout their lives.

When the results of 3 different studies were examined, 10 different features related to effective TPD programs emerged (Cordingley et al., 2015; Darling-Hammond, E, Gardner, & Espinosa, 2017; Timperley, 2008).

1. Class-based expert coaching relationship provides good opportunities for learning.
2. Teachers need collaborative learning sources to acquire new information in professional context.
3. Professional learning takes time.
4. Suggested approaches should be based on logical principles to overcome teachers' prejudices.
5. Teachers should be encouraged to follow guidelines that can guide them to adopt appropriate approaches to the context in which they are situated.
6. Professional development programs on a wide range of topics are not very effective. Teachers should therefore benefit from specific learning opportunities with a more limited scope.
7. It should be ensured that teachers have access to effective practice models applied on the subjects they are trained.
8. Effective professional development programs should be prepared taking into account the individual differences of teachers.
9. The success of TPD programs is based on the degree to which school leaders promote commitment.
10. The active participation of teachers in the preparation of TPD programs and consultation of their opinions is an important factor for greater benefit from the trainings.

All these 3 studies synthesizing teacher development studies highlight the need for social and collaborative learning among teachers. In this regard, technology creates a collaborative opportunity for geographically distant teachers.

In many corners of the world, countries are opting for school-based, differentiated and collaborative PD programs, leaving aside ineffective PD practices (Cordingley et al., 2015; Darling-Hammond et al., 2017; Timperley, 2008). Compared to developed and economically viable countries, low-income countries have more difficulty to implement effective TPD programs. However, Mcaleavy, et.al. (2018) have proposed 7 key recommendations for developing effective TPD programs in low-income countries, one of which emphasizes the role of technology.

1. Putting teacher in the focus as a professional, learner and individual.
2. Developing, implementing, measuring, and institutionalizing standards for TPD.
3. Creating professional development opportunities to encourage teacher collaboration.
4. Providing continuous support to teachers.
5. Training high quality teacher trainers.
6. Establishing teaching leadership in all stages of the education system.
7. Using different kinds of technologies to give access to content, professional development, and professional learning communities.

There are some studies in literature which identify the most important characteristics of an effective TPD program. In Lutrick and Szabo (2012)'s research study, instructional leaders mentioned five common qualities that should be in an effective TPD program. These are continuity, collaboration, data-driven design, interest and interaction. NSDC (2011) also mentions 7 components for an efficient TPD program. These are learning communities, leadership, resources, data, learning design, implementation and outcomes. According to Darling-Hammond et al. (2009), continuity in TPD programs, compliance with teachers' needs, and teacher collaboration are essential elements. In their study, Schrum and Levin (2013) stated that the design of an effective TPD program must be interactive, collaborative, engaging, differentiated, continuous, designed with appropriate resources, and implemented correctly.

2.2.1 Approaches to Teacher Professional Development

According to Gaible and Burns (2005), TPD models can be categorized into three approaches as (1) Standardized TPD, (2) Site-based TPD and (3) Self-directed TPD. Standardized TPD is a centralized approach, in which the cascade model of delivery is used to disseminate the knowledge and introduce the teachers with new ideas. In the cascade model, a group of teachers receive a training out of their institutions and return to provide ICT training for their peers. However, the model doesn't provide on-going

support to the teachers and teachers are not encouraged to collaborate and experiment the new knowledge (Gaible & Burns, 2005).

Site-based TPD can take place in schools or other settings and teachers can work with other teachers and focus on situational problems while implementing new teaching techniques in their classes. This model brings teachers together to implement a new teaching method over a period of time and provide on-going professional learning opportunities to a single set of teachers by making them collaborate in problem areas in a flexible and intensive TPD (Gaible & Burns, 2005).

The third approach, self-directed TPD, lets teachers design their own PD in a life-long learning period informally. This kind of a TPD approach had better be used as a complementary part of another approach by enabling teachers to seek for the necessary knowledge or material from more experienced teachers or internet (Gaible & Burns, 2005).

To understand the approaches of TPD with language teachers, it is also important to address the language teacher education models proposed in literature. Wallace (1991) identified three language teacher education models, which are apprentice-expert model, rationalist or theory-to-practice model and reflective model. In apprentice-expert model, less experienced teachers learn and develop their pedagogical content knowledge and teaching skills by observing more experienced teachers. In theory-to-practice model, learners are taught the theoretical knowledge and they are expected to apply this knowledge in real-world contexts. In reflective model, teachers reflect on their teaching practices so that they can make connections from one experience to another and look for new ways for effective teaching. In addition to these models, Day (1991) proposed a fourth model, the integrative model, which combines the strong aspects of all three models ensuring that teachers are exposed to pedagogic, content, pedagogic content and support knowledge through various experiences and activities.

2.2.2 Online Teacher Professional Development

TPD is a collaborative activity (Molle, 2013) and its primary aim is to increase teachers' professional knowledge and support student learning and achievement (Borko et al., 2008; Fishman et al., 2003). There are some studies arguing that the current mode of PD for teachers needs a radical change (Knapp, 2003; Lieberman & Mace, 2010). In addition to traditional workshops which are implemented in term breaks of schools, it is important to bring a new perspective to TPD programs which will transform teachers' isolation into professional learning opportunities and reach them in their busy schedule. Because of this fact, researchers have implemented internet communication technology (ICT) in TPD programs (Dede et al., 2009; Farooq et al., 2007; Hawkes & Good, 2000; Yang & Liu, 2004). Burns and Lawrie (2015) said the following about the effectiveness of professional learning using technology.

> ICT has the potential to genuinely support teacher professional learning because it can bring models of good practice, provide quality resources and encourage dialogue between knowledgeable peers. ICT can also help access hard-to-reach locations and more efficiently improve teacher learning (and therefore child-learning) in remote areas (p.18)

ICT can create effective teaching models accessible to teachers through audio and video resources. Another important aspect of technology-supported PD is the ease of access to geographically remote teachers. In recent years, the technological features of mobile phones have increased and there has been a significant increase in both wireless and mobile network coverage areas. In this way, it is possible to reach teachers who cannot be reached through traditional in-person TPD programs via mobile phones and computers (Aubusson et al., 2009).

Another reason that increases online PD is the economic dimension of the situation. Online TPD programs can be much more cost-effective considering the transportation and accommodation costs of resources, trainers, and teachers involved in in-person training programs (Burns & Lawrie, 2015). Gaible and Burns (2005) stated that because of rapid changes in technology, the durability and versatility of the devices increased, and the prices decreased continuously. This has made them attractive in

environments lacking infrastructure due to their affordable costs. Online TPD offers flexibility. The common theme of the feedback given by the teachers participating in PD programs was that they could not make full use of TPD programs due to their high workload. Technology allows you to access these trainings anywhere and anytime.

The operational definition of online TPD (oTPD) is any Internet-based learning style and professional development process that the teacher may be involved in (Elliott, 2017). Seezink and Poell (2010) defined oTPD as 'the process of acquiring and developing knowledge by using digital based environments within the framework of the personal professional development needs of teachers that can be acquired in many educational trainings'. Fishman (2016) also stated that any professional development through the Internet can be characterized as oTPD.

Practicality, authenticity, and continuity are important factors for effective TPD. What is meant by practicality is the training of teachers by concrete methods, contrary to theoretical patterns. Authenticity is that TPD programs teach pedagogy about a specific topic in a particular area. Continuity is not only the access of information through occasional workshops, but also a significant and continuous support (Mcaleavy et al., 2018). OTPD programs have significant potential to enhance and improve PD in terms of these 3 factors. In terms of practicality, low-cost videos can be prepared for teachers for classroom use (Desimone & Garet, 2015). In terms of authenticity, comprehensive digital resources can be made accessible to teachers in areas where they need PD (Fritschi & Wolf, 2012). In terms of continuity, teachers can be offered coaching support and encouraged to involve in professional learning communities for self-reflection (Desimone & Pak, 2017).

OTPD programs have lots of benefits. They are great self-improvement opportunities for teachers who cannot participate in PD trainings due to some limitations (Mcaleavy et al., 2018). OTPD provides teachers with opportunities to choose programs that they find useful for their professional growth and creates a flexible timeline for teachers (Cornelius & Macdonald, 2008; Yoder, 2001). Bereiter (2002) and Garet et al. (2001) found that efficiently designed oTPD programs offer a rich learning experience for instructors to adapt to their busy pace. However, it is not a good idea to think that

traditional in-person programs can be transferred to online platforms without considering the essential elements of online learning (Fabry, 2009).

Perraton (2010) stated that many online learning tools such as Massive Open Online Courses (MOOCs) are very important for the development of the skills of many teachers, especially in developed countries. According to him, online learning has many benefits. These are:

- distribution of instructional materials at a low cost,
- the ongoing communication happening between the learners and the trainer effectively,
- providing community of learners among students,
- ability to install and use Open Educational Sources (OECs).

OTPD can be formal or informal. Examples of informal professional learning are Professional Learning Networks (PLNs) and Professional Learning Communities (PLCs) (Cox, 2010). Both formal and informal learning enable teachers to keep their knowledge up to date on professional issues. However, the structure of informal programs is weaker, which prevents effective results. Formal professional development, on the other hand, is directly linked to educational standards, which makes it more powerful (Servage, 2009).

OTPD programs can be synchronized or asynchronous. Examples of synchronized environments are webcasts, chat rooms and audiovisual technologies, while asynchronous environments include email, forums and newsgroups (Means et al., 2009). What these tools have in common is that they create social interaction between users. In their study, Holmes, MacLeod and Signer (2011) found that both social interaction and the presence of teachers had a positive effect on 55 teachers who participated in the study.

Little and Housand (2017) mentioned 5 types of modes of delivery for oTPD programs.

1. Accessible websites and online resources
2. Technology that can interact with viewers practically
3. Professional development with asynchronous online discussion
4. Video conferencing
5. Building an Ongoing Online Community

Teachers can now easily access all kinds of information via internet instead of going to the library. Any device with internet access, especially a mobile phone, can be used for this purpose. But accessing information does not mean that information you access on this source is reliable. In this respect, creating reliable and accessible web sites and online resources is important for teachers to get the accurate information when they need it. However, information management resources are lacking in terms of the interactive and joint elements of effective oTPD programs (Darling-Hammond et al., 2009). In this regard, self-paced learning programs are online resources for hosting the interaction component. Interaction with programs such as MOOCs takes place as student-content (Brennan et al., 2018).

American researchers Polly and Hannafin (2010) investigated the scope of technologies that can be used to improve teachers' professional learning. According to their research, when teachers feel a sense of belonging on their learning processes, they are more willing to adopt new pedagogical approaches to their education because they know they have a say in choosing the content and activities. In this regard, it is easier for teachers to adopt oTPD programs because they can choose their own learning focus. Polly and Hannafin (2010) underline the importance of videos to provide effective pedagogy models in this context because they provide concrete models of classroom practice.

2.2.3 Mobile Teacher Professional Development

The developments in mobile learning technology and the application of these technologies in student learning has given an idea to the researchers that the transformation in the skills of teachers can be delivered utilizing this technology (Hu

& Garimella, 2014). The collaborative and ubiquitous nature of mobile learning practices has been experimented with a lot of studies (Attewell & Gustafsson, 2002; Godwin-jones, 2011; Roschelle, 2003; Sharples, 2000) and the definition of mobile learning varies (Aubusson et al., 2009; Druin & Jones, 2009; Jung, 2015; Mcconatha et al., 2014; Pachler et al., 2010; Sampson et al., 2013; Stoller-schai, 2015). Analyzing the common themes of these various definitions, mobile learning can be defined as using mobile devices for learning in different contexts anytime and anywhere the learner decides rather than being isolated behind the walls of a classroom. Godwin-Jones (2011) did research observing the mobile assisted language learning pedagogy and he found out that the use of mobile devices in educational purposes is most often uncreative, monotonous, and repetitive and they do not take advantage of the collaborative, authentic and innovative features of the mobile learning theory.

Studies conducted on mobile learning (Kranz et al., 2013; Möller et al., 2011; Seppälä & Alamäki, 2003) and ubiquitous learning (Kranz et al., 2013; Looi et al., 2009) address the newer trends in how to integrate technology in teaching and learning. There is also a remarkable increase in the number of studies conducted on mobile teachers' professional development (mTPD) programs (Aubusson et al., 2009; Kearney et al., 2012; Kearney & Maher, 2013). In his report in UNESCO Working Paper Series on Mobile Learning, Isaacs (2012) discussed the potential of mobile learning in TPD in different topics, such as overcoming teachers' technophobia about how to use mobile devices for educational purposes, extending professional development opportunities to a wide variety of different areas, supporting and assisting teachers in classroom practices, providing peer support among teachers, enhancing professional development and strengthening teachers' competencies in relation to ICT.

Baran (2014) also stated that considering the definitions that are emerged from different studies, there are some characteristics that we can attribute to mobile learning, which are "mobility, access, immediacy, situativity, ubiquity, convenience and contextuality" (p.18). The characteristic of mobile learning practices being mobile, accessible, and immediate makes it possible for teachers to free themselves from the physical barriers to develop their teaching. On the other hand, the characteristics of

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being situated, ubiquitous and contextual makes it possible to create collaborative learning opportunities (Jung, 2015).

As we try to reveal the potential of digital technologies to contribute to both teaching and learning, it is important to be aware of the fact that these technologies have some drawbacks as well as affordances. Baran (2014) stated that there are some challenges that can be encountered with while implementing a mTPD program, such as "ethical concerns, lack of support, accessibility and technical restraints, inadequate experience, not allowing to use mobile phone in schools and curriculum integration" (p.25). For example, Aubusson et al. (2009) cautions the researchers about the possible ethical issues that can arise such as archiving and record keeping or sharing classroom experiences and asks the question whether the teaching profession is ready for mobile professional learning experiences. Another challenge is the need for teachers to receive technical and material support when necessary (Burston, 2014). In their study, Shohel and Power (2010) overcame this problem with the experts who had regular visits to the schools to assist the teachers and provided online technical support. Teachers also have challenges in integrating mobile learning in students' learning and in their own learning (Foulger et al., 2013). Some researchers also mentioned about the challenge of accessibility of mobile devices in learning. For example, Gado, Ferguson and Van't Hooft (2006) stated that teachers' and learners' problems in accessing mobile devices prevents them from a learning opportunity that supports ubiquitous and collaborated context coordinated with multiple resources.

Innovation adoption is a challenging process. Teachers can change their habits gradually based on how comfortable they feel while using technology (Donovan, Hartley, & Strudler, 2007). It is important to make sure that teachers are motivated and supported to participate in the mobile TPD as much as possible. To provide this necessity, teachers' input and suggestions into the development of the program is necessary whenever possible. Consulting the teachers on the usefulness of the mTPD program during and after the implementation can also be beneficial to align content and delivery of mTPD programs with teacher concerns (Hennessy et al., 2015).

2.2.3.1 IPAC Pedagogical Framework of Mobile Learning

Mobile learning shouldn't be regarded as a tool for self-learning (Lam et al., 2011). It can be used to facilitate collaboration with other teachers and reflect on each other's teaching to gain new insights of education. Digital content and pedagogical models need to be updated, expanded and developed to get the most benefit from mobile learning affordances (West, 2012). To create a robust mobile course design and provide research-informed mobile learning sources, pedagogical frameworks can be integrated into the course design and learners can be introduced a systematic process of intervention and assessment (Dallimore & Souza, 2002).

Kearney et al. (2012) proposed iPAC pedagogical framework of mobile learning which takes its roots from socio-cultural perspective. iPAC Framework was originally developed as the theoretical underpinning for the Mobile Learning Kit, a MTEEP project which was aimed for teacher educator and trainers to help teachers better understand how they can enhance learning activities by including the pedagogical features of mobile devices. It was then further developed over a series of more mobile learning projects and emerged as a robust pedagogical framework for mobile pedagogies (Kearney et al., 2019, 2020; Kearney & Maher, 2013) .

iPAC Framework includes three main dimensions: personalization, authenticity, and collaboration (Figure 2.3). Each dimension is divided into sub-dimensions. With these dimensions, Kearney and his colleagues identified the specific pedagogical affordances of mobile learning, which they call signature pedagogies (Kearney, Burke, & Schuck, 2019, p.751). Using these signature pedagogies, meaningful and authentic mobile pedagogies can be designed or evaluated (Koenraad, 2019).
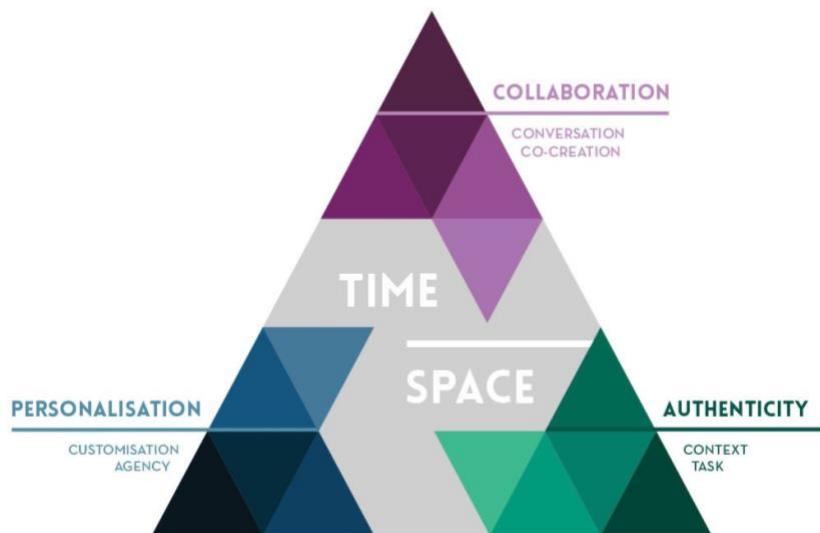
Figure 2. 3. iPAC Pedagogical Framework of Mobile Learning. Reprinted from "The iPAC Scale: A Survey to Measure Distinctive Mobile Pedagogies" by Kearney et al., 2019, *TechTrends*, *63*(6), 751–764.

Personalization includes pedagogical dimensions such as agency and customization. High levels of personalization mean the student can obtain a high degree of agency with the opportunity to customize the tools and activities in the program. Authenticity includes the sub-dimensions of contextualization and situatedness which proposes that the mobile learning activities should include rich and contextual content which enables a situated learning environment. Lastly, collaboration consists of conversation and data sharing sub-themes. A high degree of collaboration which includes conversation and data sharing with their teacher and with each other allows learners to have rich learning experiences. The question checklist below was created from the constructs and sub-constructs of iPAC Framework to analyze a program for its mobile pedagogies (Kearney et al., 2012).

Agency: Do the students have a high degree of control over the place, pace, and time they learn?

Customization: Are there features in the program which let learners customize the mobile learning activities according to their needs?

Setting: Does the program provide the learners a setting where they can take their mobile device with them to collect and analyse data or to participate in networked learning activities?

Task: Does the program provide learning tasks where learners can practise the kind of activities they might encounter in a real world context?

Conversation: Are the learners given opportunities to communicate with the teacher or each other in the program?

Data sharing: Are the learners given opportunities to exchange information and resources with their peers or teachers?

2.2.3.2 Previous Research Studies on mTPD

In recent years, several studies have been conducted in using mobile learning in TPD programs. Gao et al., 2021 reviewed 210 research papers between 2008 to 2020 focusing the research on pre-service English teachers' professional development based on mobile learning. Based on the findings, they asserted that the effect of teachers' informal learning with mobile technologies can be improved with the efforts of different stakeholders such as teachers, school management, learning resources and network environment. The attitude of teachers towards mobile learning, creating learning resources of mobile technologies, secured internet environment on mobile learning platforms and a well-established learning community for teachers are essential factors to provide more effective mobile professional development opportunities for English teachers (Gao et al., 2021).

In another study, Handal et al. (2019) conducted a study examining 149 fourth year pre-service teachers' adoption of mobile learning devices. Participants were enrolled in Math's education. During the study, they learned to explore, arrange, and evaluate educational apps using a checklist and they prepared a lesson plan using mobile technology. At the end of the study, the findings showed that participants supported mobile learning for its personalized and collaborative capabilities. Findings also showed that teachers preferred to reach and produce content in digital format, preferably with their tablets, rather than using printed resources, because of their

accessibility anytime and anywhere they wanted.

Hicks and Bose (2019) conducted a study applying a design framework which included a step-by-step process to align mobile technology applications to a teacher preparation course. The course included multiple mobile learning resources. For example, participants were assigned a reading using the Tellegami app on class iPads and they were expected to create a video recording a short summary of the reading assignment. Researchers highlighted a challenge presenting the most appropriate authentic context that could address to each student's needs. The research was still in progress at the time of this writing and there was no formal data reporting its direct impact for literature. However, researchers asserted that implementation cycles of the course design would be continued in the upcoming semesters and observation-based evidence showed a positive impact on teacher education at that university.

Van der Linden et al. (2019) proposed a generic model for video coaching and specific design features for mobile video coaching. In their study, they investigated how mobile technologies contribute to teacher learning within the context of high-quality video coaching. They concluded that mobile teacher learning can accommodate situated learning by incorporating authentic contexts such as videos that would normally be out of reach. It also provides access to expertise through the use of audio or video. Additionally, verbal interaction with an expert or support can be possible with this technology. Mobile technologies in teacher learning can also provide accessibility to teaching materials and teachers can share these materials with each other.

In another study, Mac Mahon et al. (2019) investigated if remote observation with mobile technologies could support the professional learning of student teachers and tutors in a teacher education program. Participants used Zoom video conferencing program on their iPads for remote observation and mobile technology was embedded in all phases of the practice. Findings showed that remote observation allowed for a more authentic teaching and learning context where student teachers were less nervous. It also facilitated social learning and provided detailed feedback from multiple sources.

Parmigiani et al. (2019) worked with student teachers in the department of education of a university to investigate how mobile technologies facilitate the development of participants' reflective thinking during their educational training. To do this, they designed a model composed of four steps. In the first step, knowledge was presented with theoretical lectures by the teacher educators at the university. In the second step, reflective thinking procedures were conducted through smartphones and cloud-based m-learning. The third step activities took place in the classroom applying what they have learned in the first 2 steps. In the final step, participants reflected on the application of their new knowledge through smartphones and cloud-based m-learning. The findings showed that participants improved their questionnaire scores after their experience with the mobile devices, while participants in the control group, who didn't experience mobile learning activities, didn't show any significant difference. The study also showed that participants found many opportunities for meaningful interactions with other participants, their technological competency developed, and they improved and enhanced their reflective skills by connecting theory and practice effectively.

Lee and Kim (2016) conducted a study designing and implementing a mobile-based open learning course entitled SMART Teaching 3.0 for 149 EFL teachers. The course consisted of 42 video clips. The purpose of the study was to suggest a new learning model for English teachers and validate the course. Data were collected via website statistics data, comments on video postings/weekly journals and in-depth interviews. The results showed that the course facilitated teachers' self-directed learning. Additionally, teachers were able to expand the time and place of their teacher development noteworthily. They were able to study the course in their spare time between classes, at home after work, during their commutes or at a cafe, which made it possible to integrate professional development into their daily lives.

In another study, Beauchamp et al. (2015) combined findings from two national research projects in Scotland and Wales to develop an authentic professional development model for primary teachers using iPad. Their ultimate focus was to understand how mobile technologies can be integrated to the professional development of teachers effectively. Data was collected with both quantitative and qualitative

techniques from parents, teachers, and students. The findings suggested that teachers are apt to use, adopt and integrate mobile technologies in a highly experiential and playful fashion and a linear structure or deficit model of professional development models should be avoided while designing these programs. According to the findings, teachers are very willing to learn in their own time and at their own pace. They reject traditional models of sequential and staged professional development programs and they don't perceive the need for any formal training.

In a study conducted by Keskin and Kuzu (2015), a mobile learning system was developed for the professional development of the faculty in a Turkish university. In this study, the researchers created a mobile learning system and examined the perceptions and experiences of the faculty using this system. They conducted their research according to the phases of design-based research. These are analyzing problems by researchers and teachers, developing solutions within a theoretical basis, testing these solutions within practice, reflecting and documenting to determine design principles (Reeves, 2006). In the second stage of their study, faculty's opinions about the points to be considered while developing the mobile learning system were taken through focus-group interviews and questionnaire. As a result of the information obtained, it was decided that the m-learning system to be developed would be based on the comprehensive m-learning and performance support model developed by Metcalf (2006).

In his dissertation study, Saldana Jr. (2015) developed a mobile professional development program and investigated the effect of mobile professional development taxonomic rigor on teachers' attitudes and opinions regarding technology. The researcher utilized the common themes of three instructional models (ADDIE, Gagne's Conditions of Learning and ARCS Motivational Model) and designed the mobile platform on Weebly. 40 in-service teachers took a pre-test measuring their TPACK attitudes and beliefs, completed the mPD program and then completed the post-test. At the end of the study, there was no significant difference in teacher gains across the three treatment conditions.

In 2015, the British Council conducted a survey with English teachers in 6 South Asian

countries (British Council, 2015). The purpose of this project was to understand teachers' level of access to various digital technologies such as TV, computers, or mobile phones and to understand their willingness to use these technologies to support their professional development. In this study, it was revealed that teachers were more familiar with mobile phones than computers. In addition, teachers stated that mobile phones are an effective tool for reaching learning and teaching materials, communicating with experts and other teachers and being part of social communities with common CPD goals.

Burns and Lawrie (2015) developed a guide based on information gathered from nineteen experts in a 19-week forum on teacher professional development. In this report, they mentioned 8 promising technologies that could have potential for teacher education, especially in low-income and sensitive context countries. These include audio learning, video, OER, computerized student testing, ICT centers in schools, mobile phones, online communication and computer gaming. They also stated that, among these devices, mobile phones still have little convincing evidence, but they are cost-effective, portable, easy to use and provide web browsing opportunities for professional learning.

The aim of another mTPD study, English in Action, (Li et al., 2014), was to make the classroom practices of English teachers more communicative and to increase the language competencies of Bangladeshi students. The research lasted from 2008 to 2017. During the pilot stage, teachers were given multimedia resources with iPods and taught how to use them. However, when the project cost was calculated, the budget was limited and decided on Nokia phone, portable amplifier and 4 GB SD cards. There were hundreds of audio-visuals and text-based resources that teachers were able to access in SD cards for both in-class practice and professional development. At the end of 2017, the project reached 51000 teachers and 7 million students. Internal evaluations have shown that the EIA has had a significant impact on classroom practices. Compared to baseline evaluations, the student talk time increased from 2% -4% at the beginning to 88% according to a 2011 report. In addition, teachers' English-speaking time in the classroom increased from 33% before the study to 71% after the study. All assessments of the EIA have shown that using low-budget technologies to

deliver high-quality TPD training to many teachers yielded successful results.

In another study joint with Nokia in 2012, UNESCO conducted 5 regional studies in Latin America, North America, Europe, Africa, Middle East and Asia on supporting teachers' learning via smartphones (Dykes & Knight, 2012; Fritschi & Wolf, 2012; Isaacs, 2012; Jara, et al,, 2012; Miao & West, 2017). The research in Nigeria aimed to improve the pedagogical practices of primary school teachers (Miao & West, 2017). For this purpose, 50 teachers from 50 different schools were given Nokia branded phones and trained on how to use the mobile learning program. Teachers were divided into 5 groups and each teacher was assigned to a teacher trainer to provide continuous support. The group met regularly to form a professional learning community and discuss the practice. In a 52-week period, 50-100 words and a visual content were sent daily. The content became more and more difficult, and content was produced on topics such as child language acquisition, production, resource use for children and progress monitoring.

Similarly, the project in Pakistan aimed to improve the pedagogical knowledge and practices of early childhood education teachers and in this direction, 150 teachers from 75 schools were employed (Miao & West, 2017). Teachers were provided with Nokia phones and 6 months of free internet, Sim cards with calls and messages to communicate with each other. Teachers received 3 days of training on how to use their mobile phones and how to access their content. A program consisting of introduction to Early Childhood Education, effective implementation, key areas of learning and effective assessment has been prepared and a program of 20 videos including lectures, class applications and assessment exams has been made available to teachers. At the same time, a Facebook page was created to enable teachers to communicate with other participants.

These projects in Nigeria and Pakistan were evaluated by independent evaluators UNESCO and Nokia. The data were collected by Likert-scale questionnaires, open-ended questions, data collected by tracking use anonymously, and the surveys given at the beginning and end of the study. Analyzes were conducted to understand the teachers' opinions of the effect of intervention and changes in technology skills,

frequency of technology use, attitudes towards technology use for instruction and learning, and pedagogical knowledge (Miao & West, 2017). Feedback from participants in Nigeria was positive. English language skills improved and their use for teaching ICT increased. Participants' frequency of interaction with other teachers via mobile phone was increased and feelings of loneliness decreased. According to the feedback given by the teachers, it was more preferable to give ideas about classroom practices with direct messages instead of reflection of teachers with open-ended questions (Miao & West, 2017).

Feedback from participants in the Pakistan project was also generally positive. Teachers stated that there was an increase in their pedagogical and technical skills, and they started to focus on activity-based learning. They used their mobile phones more to access educational content. In addition, the designers stated that the most effective results will be obtained from the studies where the technology is introduced to the teachers with well-organized and well-arranged content. They also stated that technology could be used for TPD programs by completing them rather than replacing (Miao & West, 2017).

In the same study, Miao and West (2017) cited 5 reasons why the use of mobile phones in the field of teacher development is promising.

1. Many teachers in developing countries already have smart mobile phones.
2. Mobile devices have an interface and functionality that can be easily understood by many professionals and non-experts.
3. Mobile networks now cover much of the world.
4. Mobile devices are dynamic communication devices.
5. Mobile devices can provide learning anytime and anywhere (p. 6).

In a pilot project implemented in Ghana in 2012-2013 (Swaffield et al., 2013), SMS messages were regularly sent to 175 school administrators who had previously received face-to-face leadership training. The purpose of SMS messages was to strengthen the understanding and participation of the participants. At the end of the

study, it was determined that the managers perceived the sent messages as a momentum for change and that they helped them to learn.

In addition to studies that prove the positive effects of mobile technology on teacher professional development, it is also important to examine ineffective or partially effective studies in order to design more effective mTPD programs. Boitshwarelo (2009)'s online collaborative learning experiment on secondary school science teachers failed unexpectedly. Although the participants were enthusiastic at first, they broke away from the virtual community of practice due to some technical problems and excessive workload. Miao and West (2017) also stated that even the most effective mobile learning applications could not be reliable in practice due to technical problems. Onguko (2014) said the following about problems with this in mind:

> Easy access to electricity available in western countries, uninterrupted and inexpensive internet connection and access to powerful technologies such as computers and tablets enabled the definition of blended learning to be determined according to the western context. Therefore, the context in which technologies are to be incorporated into learning should be well evaluated. (p.78)

In addition, institutional and attitudinal barriers may lead to a prevention in the effectiveness of technology-supported professional learning. Thang et al. (2016) explained these barriers in the Malaysian Smart School Initiative project. Many responsibilities of teachers other than using oTPD programs prevented them from using this program. Teachers were reluctant to apply these new professional learning opportunities, as teaching responsibilities, administrative affairs and extracurricular activities occupy much of their time, as well as students' concerns about preparing for general exams and being successful. The problem here was more about human factors than the appropriateness of technology. There was a major inconsistency between teacher views on the teaching styles needed for students to be more successful in exams with a better teaching model through online TPD. Therefore, teachers had doubts about the use of technology.

For these reasons, designers who prepare mTPD programs need to think about how technology can be used to increase teacher performance and how teachers can be

supported and encouraged to make the most of their learning opportunities. This requires a risk analysis to decrease the likelihood of failure (Aubusson et al., 2009). Risks that may occur in online TPD programs generally include technical difficulties, approval of school administrators and other stakeholders, workload problems, teacher support, reconciliation with other entrepreneurs (Mcaleavy et al., 2018).

2.2.4 Previous Research Studies on PD of Language Instructors in Turkey

English language teaching in higher education institutions in Turkey is provided by the school of foreign languages or foreign languages units connected to rector's office. Yurtsever (2013) stated in her article that EFL instructors in foreign languages schools of Turkish universities are expected to fulfill their professional development considering their students' needs but the optimal methods to accomplish this task are not clearly specified. To fill this gap, some research projects and studies, which are discussed below, have been conducted to better understand the situation from instructors' perspectives and eventually identify the characteristics of professional development for EFL instructors which provide an effective teaching context.

In a study conducted by Yurtsever (2013), EFL instructors' beliefs about traditional and constructivist professional development models were investigated. As a result of this study conducted with 91 EFL instructors at a public university, both traditional (training) and constructivist (mentoring, peer-coaching, self-direct) models received positive opinions by the instructors. The most preferred model among these models was the self-directed model. Instructors were aware of their PD needs and tended to continue their professional development with reflective practices in a collaborative way.

Arikan (2004) also underlined the importance of reflective practices in the professional development process of EFL instructors. In his study examining the relationship of EFL instructors working at universities in Turkey with the PD programs they participated, he stated that instructor narratives reveal many challenging points both in professional development programs and in other institutional practices.

Furthermore, instead of imposing PD programs on instructors, the socio-educational environment in which the teacher is involved should be visualized and experienced in a participatory manner. According to instructors, PD programs are a lifelong process involving interactions and educational backgrounds wherever development continues, whether inside or outside the school. Another striking point in the research was that EFL instructors focused more on how the programs were taught rather than what was taught in PD programs. According to the instructors, many PD programs they attended were similar in many ways. Instead of activating professional development, these programs were to diminish the impact of professional development on instructors.

In another study conducted with such a narrative view (Mitton-Kukner & Akyuz, 2012), it was stated that although there were many PD opportunities in theory for English teachers (CELTA, DELTA, workshops offered by the English Language Teachers' Association, British Council and the United States Information Agency), the only opportunity available in practice for the participant instructors was traditional postgraduate studies. In fact, this is the case for many EFL instructors in the other contexts in Turkey. On the other hand, Mitton-Kukner and Akyuz (2012) also added that the complex practices performed at the university encouraged instructors to follow innovations in professional learning and to create opportunities to learn from any experience, whether positive or not.

In her study with 114 instructors, Sarac (2015) investigated the most effective and ineffective professional development activities found by practitioners. As a result of the study, it was found that, compared to the positive contribution received from colleagues, the feedback received from certificate programs, conferences and by teacher trainers had less effect on EFL instructors' professional development. The reason for this finding is because of the expectation differences between teacher trainers and instructors and the instructor perceptions that trainers have judgmental manners. To prevent this, it was stated that instructors should work in cooperation with each other.

Arıkan and Turhan (2009) investigated the changes in EFL instructors' perceptions and perceived needs of expectations before and after the in-service training. As a result of

the study conducted with 30 EFL instructors at a private university in Ankara, no significant difference was found between novice and expert instructors. Instructors said that they would benefit from activities consisting of related and to-the-point topics to be given on platforms where they could share their experiences and ideas. However, the instructors wanted these programs to be optional rather than compulsory.

Kulavuz-Onal and Tatar (2017) conducted a study explaining the relationship between instructor burnout and the participation of EFL instructors in public and private universities in professional development activities. As a result of the study, it was seen that the EFL instructors in the public universities had less sense of personal accomplishment than the instructors in the private universities. A significant relationship was found between sense of personal accomplishment and participation in professional development activities. It was stated that creating more PD opportunities for instructors would increase the sense of personal accomplishment of instructors.

In 2015, in a study conducted by the Economic Policy Research Foundation of Turkey (TEPAV) and British Council (British Council & TEPAV, 2015), English education in higher education institutions in Turkey was examined within the context of international, national, institutional and departmental aspects. In addition, the strengths of teachers and students and the difficulties they faced were revealed. The research was carried out with 414 EFL instructors and 4320 students in 38 Turkish universities from different regions of the country. One of the findings that was important for the current study was that EFL instructors should have more PD opportunities as part of quality assurance and accreditation. When EFL instructors were asked what PD subjects they needed most, 'Developing EAP/ESP Skills' topic came into prominence, followed by 'Using ICT in Class'.

There have been some studies in the literature on the readiness, attitudes and practices of EFL instructors working in Turkish universities in integrating ICT into language teaching (Ardıç & Çiftçi, 2019; Cobanoglu & Yucel, 2017; Ersungur, 2013). When these studies are reviewed, some findings regarding the professional development of EFL instructors appear, which are as follows;

1. EFL instructors who use technological tools in English lessons are more useful to their students (Ersungur, 2013).

2. EFL instructors do not regularly follow new trends in English language teaching (Cobanoglu & Yucel, 2017).

3. Most EFL instructors consider themselves insufficient to use ICT in their classes. There is a need for professional development in this regard (Cobanoglu & Yucel, 2017).

4. EFL instructors generally have a positive attitude towards ICT in language teaching. That's why, PD studies can be done on the integration of digital tools into the program that will facilitate learning and teaching English (Cobanoglu & Yucel, 2017).

5. EFL instructors can be more effective if they combine the opportunities offered by technology with their teaching (Ersungur, 2013).

In a study conducted in 6 public and 5 state universities with 193 EFL instructors in Turkey, Ardıç and Çiftçi (2019) aimed to determine PD needs of instructors in using ICT in language teaching. It was found that EFL instructors did not see themselves as competent in technological applications (office applications, web facilities, e-presentation, graphic tools). It was also found that instructors' prior interest and experience with ICT provides an advantage in using the technology in language teaching. Another interesting finding is that the gender of the EFL instructors, school types, experiences and whether they had previously received PD in the ICT field did not make a significant difference in the professional development needs of the instructors in the ICT field. EFL instructors also stated that they would like to see teaching tools focusing on subject mastery and pedagogical practices rather than theoretical knowledge.

2.2.5 Previous Research Studies on TPD About Using Digital Games in Learning

Research on professional development of language teachers about how to successfully integrate digital games in their language classes is not very prevalent but the existing

research gives important insights about the essential components that should be included in a TPD program and the impact of these TPD programs on language teachers' perceptions.

McNeil (2018) designed a professional development program to prepare language teachers to use digital games in language instruction. The program was given in an elective course within MA TESOL program of a university and participants were 10 Korean and international pre-service and in-service language teachers. The program was prepared employing situated learning principals and teachers had lots of digital gaming experience. Data was collected via gaming journals, field notes, observations from class discussions and an open-ended survey. Results of the study showed that the TPD program supported teachers' digital game-enhanced pedagogical skills and teachers developed positive perceptions about how to use games in language instruction.

In another study, Kuhn and Stevens (2017) designed a Massively Open Online Course (MOOC) named TESOL EVO Minecraft MOOC to foster a community of teachers where game play is encouraged. They explained how the course was designed, how they fostered teachers' literacy in game playing and how teachers could understand the impact of new pedagogy by experiencing game playing. The teachers played the game and shared ideas on blogs and posting videos. Teachers reported that the game playing experience fostered a community spirit among the teachers and a cultural connection between teachers and students.

Alyaz and Genc (2016) investigated the impact of serious digital games to the development of professional skills of pre-service language teachers. The study was employed in educational technologies and materials design course and participants were 60 pre-service German language teachers. Participants played the digital game, Adventure German-A Mysterious Mission, out of class and they reflected on their experiences through LMS and on a social network webpage. Data was collected through information form, vocabulary learning strategies scale, achievement test, game diary and in-class interviews. At the end of the study, the digital game made a positive impact on participants' qualifications in the context of digital game-based

language learning, and they reported that they were willing to use digital games in their classes in the future.

Becker (2007) designed a graduate course for language teachers as an introduction to digital games and gaming for instruction and learning. In this course, teachers were expected to explore the theories, affordances, and limitations of designing and using instructional games and COTS games in and out of classroom settings. In addition to the seminar-style classroom activities such as weekly readings, teachers were expected to prepare a project by either designing a game to be used in a classroom or design an instructional intervention with a digital game including all the necessary components such as learning activities and materials. Game playing was the key feature of the course design. At the end of the study, participants reported that their perceptions regarding the use of digital games in formal instruction changed. Initially, they thought that digital games could be used as independent study resources in class but afterwards, they realized that the game they played in the course could actually be used for language learning. On the other hand, they also reported that despite their enthusiasm to use digital games in their instruction, most of them still felt that including digital games in the formal curriculum would not be possible anytime soon.

Apart from the TPD studies focusing on the professional development of language teachers, there are also some studies conducted in other disciplines. Stieler-Hunt and Jones (2019) presented a professional development model for teachers. Teachers with a mixture of primary and secondary school teachers, classroom teachers and teacher advisors who previously used different digital games in their classrooms were interviewed to understand their experiences with using digital games in their classrooms. The professional development model provided at the end of study aimed to give teachers an idea about how to work with digital games at their own pace in a supporting setting. The findings showed that TPD program facilitators should be competent about how to use digital games in classroom, Additionally, to break the resistance among teachers, they should work with small groups of teachers separately to plan a digital game lesson, pilot the use of these games in a lesson and implement the final product with the remaining teachers.

An (2018) presented a graduate level PD course at a public university in the US and investigated the effects of this course on teachers' perceptions, attitudes, self-efficacy, and behavioral intention to use digital games in classrooms. The aims of the course were to inform teachers about the potential of digital game-based learning, assess and choose games for school content, integrate these games into classroom and involve learners into design and development of activities with digital games. Situated learning theory principles were followed while designing the course with several authentic tasks, such as developing a plan to integrate a game in a lesson, designing a 3D game-based learning environment and designing a learning activity using digital games. 21 participants completed the course and data was collected via pre/post-questionnaires and participants' reflections on the assignments. At the end of the study, it was concluded that the course had a significant effect on participants' perceptions, attitudes, self-efficacy, and intentions regarding the use of digital games in classroom. However, teachers might build skeptical attitudes towards digital games since they have problems to find appropriate games to integrate in their classrooms. To minimize this situation, it is important to expose teachers to several well-designed DGBL environments to provide a better understanding about their potential.

Callaghan et al. (2018) conducted a follow-up study after implementing a digital game-based lesson intervention which aimed to investigate the effectiveness of a digital game on students' achievement. In the follow-up study, they investigated how teachers used professional development to integrate the game into their classroom more effectively. After analyzing data from interviews with 12 teachers and from survey with 863 teachers, they concluded that it is important to provide a consistent dialogue between teachers and the PD facilitators to support teachers' knowledge of the resources available in the PD.

In another study, Meletiou-Mavrotheris and Prodromou (2016) designed an instructional intervention based on TPACK model which aimed to provide pre-service primary school teachers in a Cyprus university with the knowledge, experience and skills to effectively integrate digital games within the mathematics curriculum. In the first phase of the study, participants were familiarized with game-based learning. Then they worked in groups of 3-4 to develop lesson plans and instructional materials based

on TPACK model. One member from each group implemented the lesson plan in their teaching practicum while others conducted peer observations. Lastly, they reflected on their teaching experience in an in-class session. Results of the study showed that participants had positive attitudes towards the integration of digital games in their classroom after the training; however, they viewed games as only motivational or drill-and-practice activities, rather than a tool for technology-enhanced learning. The study also illustrated that TPACK can be used as an effective model to facilitate teachers' professional development in the use of ICT in education. It was also highlighted that involving teachers in professional development activities such as lesson design or field experience helps them develop their teaching skills in ICT and transfer their understanding of TPACK into their own teaching practice.

2.2.6 TPD Program Evaluation

The evaluation of TPD programs is very important to improve the quality of TPD courses, and hence, provide effective professional development opportunities for the teachers. There are two critically important points to be considered while conducting an evaluation of teacher professional development programs; the delivery of the TPD programs and the effects of the programs on the learners (Lawrenz, 2001). The process, and outcomes of the TPD programs can be investigated through formative evaluation and/or summative evaluation. Patton (2002) made the distinction between these two evaluation methods with a very simplistic and clear explanation. He stated that 'summative evaluation determines the program effectiveness, while formative evaluation improves a program' (p.213). In other words, formative evaluation is conducted during the implementation or development stage of a program with the purpose of forming or improving the program, while summative evaluation is conducted at the end of a program with the purpose of investigating how the intended goals are achieved.

To provide sound evaluations, researchers should follow professionally defined standards. Stufflebeam and Coryn (2014) mentioned four standards that are adapted from the Joint Committee's Personnel Evaluation Standards. These are utility, propriety, feasibility, and accuracy. The utility standards help researchers define

purposes and information needs of the intended users. Evaluators are expected to become acquainted with the audiences of the evaluation. They should conduct the evaluations according to the needs of these audiences and present the results of their evaluations clearly and in an appropriate time. Feasibility standards propose that the evaluation should be planned and conducted by considering the existing circumstances reasonably and cost-effective so that various stakeholders can be more likely to accept the results of the evaluation. Propriety standards provide respect to the stakeholders involved in the evaluation. According to the propriety standards, evaluations should be carried out in an ethical, respectful, and unbiased manner. Lastly, the accuracy standards help evaluators provide sound, valid and applicable information that is obtained using methodologically reliable tools (Stufflebeam & Coryn, 2014).

There are several evaluation models that are used to evaluate different elements of programs. These models help researchers provide a structured approach to their studies and get sound and evidence-based results when evaluating the impact and effectiveness of the program. The appropriate evaluation model can be chosen by the researcher depending on the context that the evaluation is processed and the purpose of the program evaluation (Patton, 2012). For this study, CIPP evaluation model was chosen because of its flexible structure and its focus on continuous improvement of the program. The evaluation phase of the current study has two purposes; to understand what is working well and what is not in the mTPD course and to understand if the mTPD course is succeeding. Because of this fact, the process and product elements of the evaluation model were included in the evaluation phase of the study.

2.2.6.1 CIPP Evaluation Model

CIPP evaluation model is a comprehensive evaluation model that involves four stages of evaluation whose first letters are acronym for the model: C for context, I for input, P for process and P for product (Figure 2.4) (Stufflebeam & Coryn, 2014). The model was developed by Stufflebeam (1968) and the aim of the model is to help the researchers collect information about their program systematically and use that information as the program is being implemented, which will eventually lead to the improvement of the functioning of the program. The different stages of the program

are typically viewed as separate forms of evaluation, but they can also be viewed as steps or stages in a comprehensive evaluation.
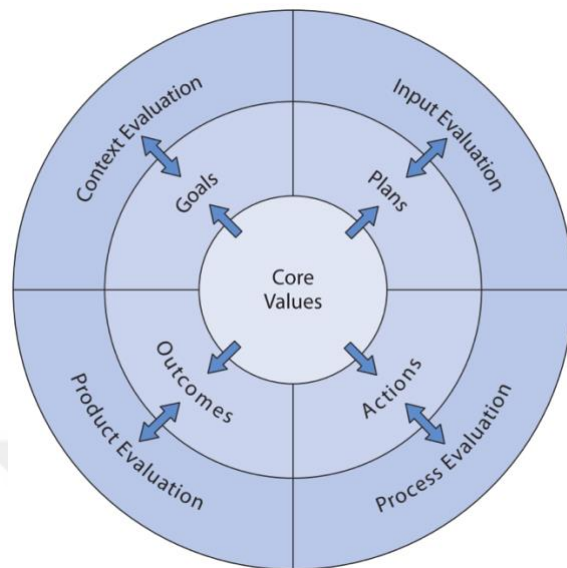
Figure 2. 4. Components of the CIPP Evaluation Model**.** Reprinted from "Evaluation Theory, Models, & Applications (Second Edition)" by Stufflebeam and Coryn, 2014, San Francisco: Jossey-Bass.

The main question that the researcher asks in context evaluation is 'What should be done?'. In context evaluation, the researcher examines and describes the context of the program by conducting needs assessment, determining the objectives of the program, and determining whether the objectives will be sufficiently responsive to the identified needs. While conducting context evaluation, data can be collected through interviews, hearings, survey, document analysis, diagnostics tests, expert review panel or a consensus-building technique such as Delphi (Stufflebeam & Coryn, 2014).

Input evaluation asks the question 'How should the program be given?'. This evaluation phase aims to determine the best activities as program inputs and resources to attain the goal of the program by comparing it to other programs in terms of alternative program strategies, procedural designs for implementing strategies and budgets and schedules. Input evaluation can be conducted by collecting data through reviewing literature, visiting exemplary programs, inventorying and analyzing

available human and material resources, solution strategies and procedural designs (Zhang et al., 2011).

In process evaluation, the researcher examines how a program is being implemented and asks the question 'Is it being done?'. This evaluation phase is an ongoing process of the implementation of a plan to determine the match between the planned activities with the real practice. Process evaluation can best be conducted by monitoring the potential challenges that the learners confront in the implementation, by describing the whole process in detail, and by continually interacting with and observing the activities of the learners. Process evaluation provides problem-solving solutions for implementation as it gives feedback to the researchers on how well the plan is being implemented, what problems threaten its success and what modifications are needed (Stufflebeam, 2003).

Product evaluation asks the question 'Did the program succeed?' and includes assessing the outcomes and merits of the program. The main purpose of product evaluation is to investigate, interpret and judge the attainments of a program. There are many applicable methods for conducting a product evaluation which include measuring outcome criteria, collecting proof of outcomes from stakeholders and performing both qualitative and quantitative analyses. The findings obtained from product evaluation help decision-makers decide whether to continue, terminate or modify the program (Stufflebeam & Coryn, 2014).

2.2.6.2 Previous Research Studies on TPD Program Evaluation Using CIPP Model

There are some TPD program evaluation studies using CIPP evaluation model. Mitchem et al. (2003) proposed a design and evaluation model which was adapted from CIPP evaluation model. The model was presented in five steps: determining desired outcomes and impact, assessing context, developing content and process, evaluating impact, and evaluating outcomes. The model aimed to identify the needs of the schools so that appropriate and effective professional development can

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be designed, developed. and delivered to the teachers.

In a mixed method study, Molope and Oduaran (2020) used the CIPP evaluation model because of its comprehensive and systematic nature. They indicated that CIPP model lets the researcher determine the sequence of evaluation activities most suitable for addressing the prevailing circumstances. Because of this fact, they focused on the context evaluation of the continuing professional development of community development practitioners in the Northwest province of South Africa. The data was collected through closed-ended questionnaire, interviews, and focus groups.

In another study, Thurab-Nkhosi (2019) aimed to evaluate the impact of a compulsory faculty development course on blended learning course implementation using CIPP evaluation model. The study used a combination of qualitative and quantitative methods and data was collected through questionnaire and interviews. All stages of CIPP model were carried out by investigating the perceptions of faculty about the program needs, the input/support provided for teaching staff, the effectiveness of process and product/ impact of the course.

In Turkey, Yurdakul et al. (2014) aimed to evaluate the professional development program of web-based content development and application organized by the Ministry of National Education. The research was theoretically based on CIPP evaluation model and Guskey's evaluation stages. The quantitative data of the study were obtained from two separate questionnaires; qualitative data were obtained from focus group and interviews. The reason for choosing the CIPP evaluation model is because of its comprehensive structure, the opportunity to use of different types of assessment, and the focus on the continuous improvement of the program.

In another Turkish study, Arslan et al. (2020) implemented and evaluated an in-service teacher training program for English language teachers in non-formal education institutions. They designed and implemented a 2-week online training program and assessed the impact of the program by comparing the learners' entry knowledge and behavior before and after the program through pre/posttests, self-assessment scales,

and lesson observations. They also investigated teachers' attitudes towards the program by collecting data through feedback forms to see whether they were satisfied with the program.

2.3 Instructional Design Models for Online Instruction

Any instruction must begin with the selection of a design model to guide each phase during the process. In addition to understanding each step in a model, it is also crucial to be aware of the context in which the model emerged and the epistemology it is based on (Heaster-Ekholm, 2020). Having knowledge about these features of a model will help instructional designers make better decisions on which models to use. Using an instructional model, it is aimed to follow an iterative process by organizing outcomes, choosing appropriate instructional strategies, arranging applicable technology, defining informative media and assessing the performance (Branch & Kopcha, 2014).

There are a lot of instructional design models that provide guidelines to achieve instructional goals. Reviewing the literature, it was found out that the most commonly used instructional design models for online instruction are Gagne and Briggs Instructional Model; Morrison, Ross and Kemp Instructional Design Model; Dick, Carey and Carey Instructional Model and ADDIE instructional design models. (Khodabandelou & Samah, 2013).

Gagne-Briggs introduced a prescriptive model to provide instructions for all learning domains (Gagne et al., 2004). Gagne and Briggs's model has 3 phases: determining objectives, sequencing and creating the external events of learning. In the first phase, topics are identified to decide on the objectives. Secondly, new information should be sequenced in a way that it can fit into a larger meaningful structure. Finally, to make sure that each individual is taken into consideration during program development, diagnostic procedures must be involved in the process. With this in mind, nine instructional events can be used to design the program (Goldberg, 1986).

Morrison, et. al., (2013) proposed a holistic and cyclic model which consists of nine

circular interrelated steps. They include instructional problems, learner characteristics, task analysis, instructional objectives, content sequencing, instructional sequencing, instructional strategies, designing the message, instructional delivery, and evaluation instruments. Throughout the instructional design process, the model stresses on the use of implementation and evaluation phases. It is also possible to begin the design from any phase or skip if needed. The model is classified as classroom oriented because it prioritizes the learner during the learning process.

Dick and Carey Model, on the other hand, has a linear order and consists of 10 components which include identifying instructional goals, conducting instructional analysis, identifying entry behaviors, writing performance objectives, developing criterion-referenced tests, developing instructional strategy, developing, and selecting instructional material, developing and conducting informative evaluation, developing and conducting summative evaluation and revising instruction. In this model, all the components work as a system collaboratively to provide effective learning outcomes. Each phase is related to each other and none of them are skipped during the design process (Dick et al., 2015).

2.3.1 ADDIE Instructional Design Model

When the 4 instructional design models in the previous section are examined thoroughly, it can be observed that all of them use different variations of the ADDIE model (Hardré, 2013). The ADDIE model (Figure 2.5), also known as Instructional System Design (ISD) or System Approach to Training (SAT), involves five different phases; analyze, design, develop, implement, and evaluate (Zhi, 2012).
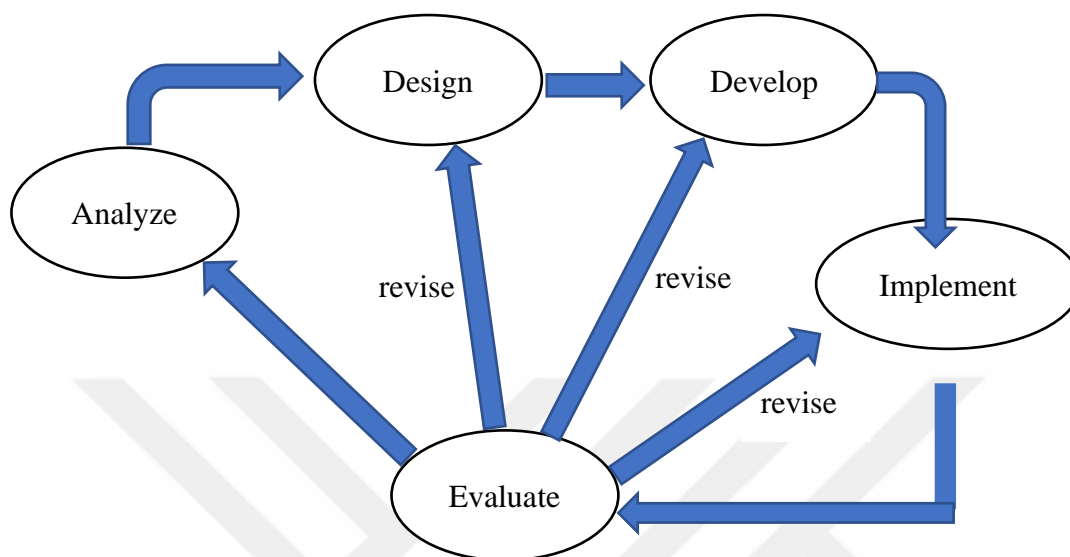
Figure 2. 5. The ADDIE Model of Instructional Design. Reprinted from "Application of ADDIE Model in instruction in teaching-learning transaction among teachers of Mara Conference Adventist secondary school, Tanzania" by Ngussa, 2014, *Journal of Education and Practice,* 5(25), 99-105.

Instructional design theorists have stated that the use of different variations of these steps is very important for effective instructional design (Aden, 2010; Fabry, 2009; Gagne et al., 2004; Kranch, 2008). By following the five phases of ADDIE instructional design model, a designer can follow the process of developing an instructional product systematically. The phases were once designed as linear steps but then they have been applied as iterative practices (Heaster-Ekholm, 2020). In the analyze phase, the designer of the program acquires a comprehensive understanding of a situation which can be summarized as the learners' needs, the gap in knowledge and a convenient instructional delivery method. In the design phase, topics and the activities are specified to determine what the learners are expected to do at the end of the instruction. Within the develop phase, all the materials and activities to be used in the instruction are created and modified. Then the instruction is delivered to the learners in the implementation phase. Finally, in the evaluation phase, the

effectiveness of the final product is determined considering the initial objectives set in the analysis phase (Drljača et al., 2017).

ADDIE instructional design model was previously used in previous research studies on teacher professional development (Al-Bulushi & Ismail, 2017; Almomen et al., 2016; Alsaleh, 2020; Karademir et al., 2021; Trust & Pektas, 2018; Yeh & Tseng, 2019). Regarding the professional development of language teachers, Karademir et al., 2021 designed a platform for self-guided digital learning materials aiming to develop teachers' skills of designing digital materials. They designed and evaluated the platform using ADDIE model and systematically explained all phases of the design process. At the end of the study, they asserted that the platform was an effective tool for both teachers and students and teachers' skills of designing digital materials improved. Regarding an online instructional design, Trust and Pektas (2018) designed an open online course for teacher professional development using ADDIE model. Similar to the current study, they used the ADDIE model as a cyclical model with multiple iterations. At the end of the course, they concluded that participants achieved the course objectives as well as their professional learning goals. They also stated that using ADDIE model, they were able to create a flexible and constructivist online course and provide a situated learning experience for the participants.

2.4 Design and Development Research

Research in education can be defined as a systematic and empirical investigation which seeks for knowledge (Richey & Klein, 2005). This knowledge can be rooted in various problems, such as societal problems or a specific problem confronted in a given situation. This specific problem can then lead the researcher to an effective solution of the practical problems. In this sense, design and development research (DDR) is committed to the latter category and its methodology is related to similar methodologies such as action research (Richey et al., 2004).

DDR is reported to answer the need for means to investigate complicated problems where innovative ways could be utilized to promote the design, development and

evaluation processes of the learning activities (Reeves, 2000b; Van Den Akker, 1999). The main goal of DDR studies is not to create and implement accomplished practices but to provide different prototypes in a cyclic process that contains analysis, design, development and evaluation phases (Van Den Akker, 1999). Reeves (2000) states the following about DDR.

> DDR focuses on complicated problems in real life situations while working with the practitioners, blends acknowledged design principles with technological elements to provide credible explanations to these complicated problems and carries out accurate and reflective analysis to assess and improve innovative methods for learning environments (p.7).

In order to understand whether a DDR project is relevant, Richey and Klein (2005) provides some questions to understand the selected problem:

1. Does the problem relate to innovating technologies and processes?
2. Is the problem one that many designers and developers confront?
3. Is the problem critical to the profession?
4. Does the problem reveal real conditions faced by the designers? (p. 25)

According to Richey and Klein (2005), the researchers should decide on the developmental twist of the relevant research project to identify the problem accurately. It is done by determining on a particular aspect of the design, development, or evaluation process, rather than concentrating on a specific variable that has an impact on learning. Hence, it is important to decide whether the researcher will focus on all parts of the design of the instruction, the development of the instruction, the summative, formative, or confirmatory evaluation of the instruction or the revision and retesting of the instruction.

Instead of hypothesis, research questions typically function as the framework for DDR studies. This approach is preferred if there is not a strong base in the literature the researcher can use as a base for proposing a hypothesis. This is basically the case with DDR if the problem concentrates on developing technologies. It is also not easy to find relevant studies in the literature related to the subject in DDR studies prepared for innovative instructional designs and developmental processes. Even so, the researcher

should still describe well the literature relevant to the foundational theory of the study (Richey et al., 2004).

DDR studies are often conducted in authentic work settings. Besides increasing the credibility of the research, it may also create methodological problems for the researcher. However, whether conducted during the research, design and development process or retrospectively, the best research studies are conducted in their natural environments (Conceicao et al., 2004; Gasper, 2003; Mosley, 2005; Reeves et al., 2005; Skaalid, 2007).

2.4.1 Type 1 & Type 2 Design and Development Research

Traditional researchers define research as the discovery of new knowledge and development can be defined as the interpretation of this knowledge into a practical form (Pelz, 1967). The focus of DDR is basically not just knowledge, but knowledge practitioners can benefit from. In DDR, one aims to produce knowledge by using the data systematically obtained from the practice. By forming new procedures and tools built on a systematical analysis of the specific cases, DDR makes it possible to provide context-specific knowledge that functions as a problem-solving mechanism or generalizable conclusions (Richey & Klein, 2005).

Richey et.al. (2004) classified design and development research (DDR) studies into two types (Table 2.1) depending on whether the conclusions of the study are contextually specific (Type 1) or generalizable (Type 2).

Table 2. 1

Types of Design and Development Research

	Type 1	Type 2
Emphasis	Study of specific product or program design, development, and/or evaluation projects	Study of design, development or evaluation processes, tools, or models
Product	Lessons learned from developing specific products and analyzing the conditions that facilitate their use	New design, development and evaluation procedures and/or models and conditions that facilitate their use
	Context-specific Conclusions ⟹ ⟹ ⟹ ⟹	*Generalized Conclusions*

Note: Reprinted from "Developmental research: Studies of instructional design and development" by *Richey et al. (2004)*, In *Handbook of Research for Educational Communications and Technology*, (February), 1099–1130.

The first type is called Type 1 research and it refers to the studies that focus on the instructional product or the process. In Type 1 DDR studies, the process focus of the study might be in different phases collectively or separately (Richey, 1994). In an analysis of representative Type 1 developmental research literature, Richey et al. (2004) defined these phases as general design/developmental/evaluation process, needs assessment, content selection, design/development, production, formative evaluation/usability, implementation/utilization/delivery, management, summative evaluation and learner outcomes. Type 1 DDR studies concentrate on a specific instructional product, program, process, or tool. They recommend situation-specific solutions.

Type 1 studies might have different organizational processes. For example, Type 1 studies might have an analysis phase, design phase, a development phase, and a try-out and evaluation phase. Another organization of a Type 1 study might consist of an analysis phase, prototype development and testing, and then the final prototype revision and retesting. Type 1 DDR research studies aim to address a specific product or program and they don't intend to offer generalizations to other contexts. Nevertheless, other researchers who are challenged by similar design and development projects can benefit from the conclusions of these studies (Richey & Klein, 2014).

The other type is called Type 2 DDR research and the studies using Type 2 DDR design model aim to construct and validate design models and processes. Type 2 DDR studies attend to a design, development, or evaluation model or process which includes creating and validating unique design models and processes. Type 2 studies might include a model construction phase, a model implementation phase, and a model validation phase (Richey & Klein, 2005).

To sum up, the vital difference between Type 1 and Type 2 studies is that Type 2 DDR studies are more generalized, and their main goal is to develop the ultimate models used in these procedures while Type 1 studies focus on the given project.

2.4.2 Research Methodologies in Design and Development Research

Researchers can use multiple research methodologies and designs in different phases of DDR studies (Richey & Klein, 2005). Table 2.2 underlines some common research methods employed in DDR studies. As can be seen in the table, case study methods can often be used in Type 1 research, as well as experimental methodology when the researcher aims to validate the tool or technique employed in the study. To obtain case study data, interviews, observations and document analysis can be performed to report the conditions under which they are applied. To determine the effectiveness of the resulting product or the specific techniques used during the DDR study, product evaluation technique is used with different data collection techniques. In Type 2 research, design models and development process are formed in different ways, such as conducting surveys of design and development, synthesizing models from the literature, using Delphi techniques conducted by respected experts and running experiments to validate the design and developmental models (Richey & Klein, 2005).

Table 2. 2

Common Research Methods Employed in DDR Studies

Type of Developmental Research	Function/Phase	Research Methodologies Employed
Type 1	Product Design & Development	Case Study, In-Depth Interview, Field Observation, Document Analysis
Type 1	Product Evaluation	Evaluation, Case Study, Survey, In-Depth Interview, Document Analysis
Type 1	Validation of Tool or Technique	Evaluation, Experimental, Expert Review, In-Depth Interview, Survey
Type 2	Model Development	Literature Review, Case Study, Survey, Delphi, Think-Aloud Protocols
Type 2	Model Use	Survey, In-Depth Interview, Case Study, Field Observation, Document Analysis
Type 2	Model Validation	Experimental, In-Depth Interview, Expert Review, Replication

Note: Reprinted from "Developmental research methods: Creating knowledge from instructional design and development practice" by Richey and Klein, 2005 , *Journal of Computing in Higher Education*, *16*(2), 23–38.

Different types of methodologies and various tools that meet the requirements of the study can be employed in DDR studies. In Type 1 studies, the whole design, development and evaluation process of an instructional product is often documented and the practices that are employed by the developmental researcher are usually in congruent with the principles of instructional systems design, which incorporates formative or summative evaluation (Richey et al., 2004). In addition to the design and development procedures, Type 1 DDR studies also include the evaluation of the program or product designed and developed by the designers. After the learners interact with the product, the changes in learners' knowledge or beliefs are measured. Generally, the effectiveness or the impact of the instruction through the final product is determined through quantitative methodology. In these studies, experimental designs can be used with or without the case study design. The data collection instruments in evaluation methods are generally surveys and achievement tests (Richey et al., 2004).

Data collection tools might vary depending on the focus of the DDR study. Richey and Klein (2005) mention three types of data collected in a DDR study.

1. Documenting design, development and evaluation processes and collecting data about time and expenses, problems, problem-solving decisions and adjustments.
2. Documenting the circumstances under which development and implementation occurred, such as accessible equipment and resources, client expertise or time and participant constraints.
3. Identifying the results of needs analysis and formative-summative evaluations and documenting the population and research context, learning measures, transfer and the effect of the intervention on the organization (p.34).

2.4.3 Participants in Design and Development Research

The participant types in a DDR study might vary depending on the phase of the developmental process and it is likely to include multiple type of participants depending on the type of DDR being conducted (Richey & Klein, 2014). There are many types of participants including but not limited to designers, developers, evaluators, clients, instructors, organizations, researchers, learners, etc. (Table 2.3).

Table 2. 3

Common Participants In DDR Studies

Type of Research	Function/Phase	Type of Participant
Type 1	Product Design & Development	Designers, Developers, Clients
Type 1	Product Evaluation	Evaluators, Clients. Learners, Instructors, Organizations
Type 1	Validation of Tool or Technique	Designers, Developers, Evaluators, Users
Type 2	Model Development	Designers, Developers, Evaluators, Researchers & Theorists
Type 2	Model Use	Designers, Developers, Evaluators, Clients
Type 2	Model Validation	Designers, Developers, Evaluators, Clients, Learners. Instructors, Organizations

Note: Reprinted from "Developmental research methods: Creating knowledge from instructional design and development practice" by Richey and Klein, 2005 , *Journal of Computing in Higher Education*, *16*(2), 23–38.

2.4.4 Strengths of Design and Development Research Design

Van den Akker (1999) lists some factors that differ DDR activities from other design and development approaches in professional practices. Firstly, he suggests that literature is searched more deeply for state-of-the-art knowledge to find valid and clear connections between the current project and the previous projects. Secondly, the design, development and evaluation practices are based on strong theoretical rationale. While testing the quality of the product empirically, the theoretical articulation of the intervention and the design principles enhance the transparency and credibility of the rational of the research. Another factor that differs DDR from others is the strong empirical evidence provided by the intervention, which shows the effectiveness and usefulness of the intervention in real settings. And lastly, systematic documentation,

analysis and reflection of the whole design, development, implementation and evaluation processes contribute to the enhancement of the methodology of design and development.

DDR intends to offer innovative solutions for educational problems by interacting with practitioners, such as teachers, program developers and policy makers. Unlike the traditional research approaches, the main purpose is not to test whether theory, when applied to practice is a good predictor of the situation. DDR researchers believe that there is a more complex and dynamic relationship between theory and practice, and it is essential to interact with the practitioners so that it can be possible to clarify the existing educational problem and offer a practical and effective solution with a strong and systematic foundation. Design and developmental researchers propose two ways in order to achieve an effective solution to the existing problem; (1) an iterative process of successive approximation or (2) evolutionary prototyping of the desired product (Van den Akker et al., 2006).

There are some studies in DDR literature which says that the studies conducted in instructional technology are poor in quality (Reeves, 2000; Reeves et al., 2005) and they have all stated that it may be possible to increase the quality of research in instructional technology by using DDR which "focuses on complicated problems in real life situations while working with the practitioners, blends acknowledged design principles with technological elements to provide credible explanations to these complicated problems and carries out accurate and reflective analysis to assess and improve innovative methods for learning environments" (Reeves, 2000, p.7).

2.4.5 Limitations of Design and Development Research

According to Richey and Klein (2005), design and development researchers can encounter some methodological problems. For example, the contextual variables in the natural setting such as client's design experience, designer expertise or the time limit might be difficult to control in the research design. To eliminate this problem, the researcher should describe these variables very carefully. Another common

problem that the design and development researchers might confront is the researcher bias, when the researcher is also a participant, such as the designer or developer in the study. In this case, it is possible to ensure objectivity by using appropriate and systematic data collection techniques. Another common problem in DDR is providing the integrity of recall data. Using documents or data that was prepared in past projects or structured interviews of participants who were involved in the same project helps the design and development researcher triangulate the data collected in the study.

According to Van den Akker (1999), one of the limitations of DDR is that design and development processes of the product consist of complex and innovative tasks but validated principles to support the design and development of these processes are very few. However, the aim in DDR studies is not to establish complete interventions, but to provide successive prototypes of the product that can fulfill the innovative requirements of the program. The whole process includes cyclic or spiral phases of analysis, design, development, evaluation and revision activities and this process continues until the product meets the criteria of internal consistency and effectiveness.

There might be conflictions between the designers who give priority to creating innovative interventions and researchers who want to provide the reliability and validity of the product in order to get the empirical proof of outcomes. Van den Akker (1999) defines this problem as the controversy between the subjective and imaginative involvement and the objective and critical distance; however, he concludes that this problem might also result in productivity by contributing to balanced solutions.

According to Van den Akker (1999), a problem might arise when the researcher wants to use formative evaluation in the DDR study because it might be very difficult to isolate, manipulate and measure different variables in the same study. Since formative research investigates interventions with many interrelated elements, experimental approaches are hard to apply if a researcher wants to employ formative evaluations in their study. However, if the design and development researcher designs an instructional intervention and wants to measure the effectiveness of the final product, summative evaluation via experimental methods can be employed.

The last problem is about the difficulty of generalization of findings with statistical techniques in a DDR study because of the small sample sizes. Instead of using statistical generalization of findings, one has to be directed to search for the transferability of the conclusions obtained from the study to the theoretical propositions related to their own context. This can be achieved through articulating the design and development principles carefully and describing the implementation context as well as evaluation procedures thoroughly. By increasing the ecological validity of the findings, one can help the other potential researchers to transfer the necessary knowledge to their own context (Van Den Akker, 1999).

2.5 Summary of the Literature

The aim of this study is to design develop and evaluate a mTPD course on DGELL. In order to situate the current research withing existing literature and to create a solid theoretical framework and methodology in the study, it is important to conduct a literature review on various dimensions of the study (Creswell, 2014). The theoretical framework of this study was formed by examining five main areas in literature: (1) using digital games in language learning, (2) teacher professional development (TPD), and (3) instructional technology design models (4) TPD program evaluation and (5) Design and Development Research design.

First, the literature on the use of digital games in language learning was examined in depth. For many years, a variety of researchers have delved into the role of games in learning (Csikszentmihalyi, 1990; Lantolf & Thorne, 2007; Piaget, 1999; Prensky, 2003; Vygotsky, 1989) and previous research on using games in learning indicated that game is intertwined with learning processes and that well-designed games are similar to well-designed learning environments (Shelton et al., 2011). Examining the literature on DGELL, it was seen that studies that reveal the potential of COTS games generally focus on three main topics: (1) providing contextualized learning with intercultural awareness, (2) mastering language skills such as listening and reading, and (3) learning vocabulary.

Previous research on digital games also revealed that DGBLL and DGELL terms are used interchangeably (Sykes & Reinhardt, 2013). Therefore, it was considered important to reveal the difference between these two approaches. In addition, studies highlighting the affordances provided by COTS games in language learning have been examined. Previous research on how to integrate digital games into language teaching was reviewed and key aspects of TPACK framework and PCaRD model were explained providing evidence from the previous research.

Another research area focused on in the literature review was teacher professional development. The important elements for an effective TPD program were revealed based on the existing literature and TPD program approaches were explained. Then, relevant research on online professional development (oTPD) programs was examined and key features of effective oTPD programs were identified from the relevant literature. Next, the literature on mobile teacher professional development (mTPD) programs was examined. The key features, affordances, and limitations of mTPD programs were revealed based on previous research. Additionally, the pedagogical features of mobile learning were identified with the constructs and sub-constructs of iPAC framework, a framework which is used to integrate mobile learning elements into a learning design. After reviewing the literature about iPAC framework, previous studies conducted on mTPD programs were examined and important findings and results were explained.

To consolidate what is known about current practices and identify any gaps in literature, TPD studies conducted previously with language instructors in Turkish universities were examined. This section reported what TPD topics were investigated in previous research, what findings were provided from these studies, what aspects of Turkish instructors' TPD needs further research and what TPD needs and expectations Turkish instructors have. Finally, previous research regarding the evaluation of TPD programs were examined and the program evaluation model of the current study, CIPP evaluation model was scrutinized by reviewing previous TPD studies which employ this model in their evaluation phases.

Subsequently, the critical points to be considered while conducting an evaluation of

TPD programs were highlighted and the steps to be followed in CIPP evaluation model were briefly explained. In the following section, the most commonly used design models in online instructional design, Gagne and Briggs Instructional Model, Morrison, Ross and Kemp Instructional Design Model, Dick, Carey and Carey Instructional Model, and ADDIE instructional design model were explained. The current study employed ADDIE instructional design model to systematically develop the mTPD course. Because of this fact, ADDIE instructional design model was explained further and previous research studies which employed ADDIE instructional design model were presented.

Finally, in the last section, in order to integrate the different components of the study in a coherent and logical way, DDR design was reviewed in the literature to address the research processes of the current study effectively.

In conclusion, this chapter intended to shed a light on the previous literature by providing evidence-based and rigorous explanations to the theoretical background of the current study. The following chapter reports the methodological framework employed in this study.

CHAPTER 3

METHOD

This chapter introduces the research questions and methodology for this design and development research study regarding the design, development, and evaluation of a mobile teacher professional development course on Digital Game-Enhanced Language Learning. The participants, context, procedures, design, and development of the mTPD course, data collection tools, role of the researcher, data analysis and the ethical concerns are also primary components of this chapter.

3.1 Research Questions

The research questions which guided the present study are as follows:

1. What are the perceptions of the language instructors towards the mobile teacher professional development course on Digital Game-Enhanced Language Learning?

   1.1 What are the perceptions of the language instructors about the content of the mTPD course on DGELL?
   1.2 What are the perceptions of the language instructors about the usability of the mTPD course on DGELL?
   1.3 What are the perceptions of the language instructors about the effectiveness of the mTPD course on DGELL?

2. To what extent do the language instructors' perceptions about the use of digital games in language learning change after the implementation of mTPD course?

3. To what extent do the language instructors' knowledge of DGELL change at the end of mTPD course?

3.2 Research Design

The main aim of this study is to develop a mTPD course on DGELL and to evaluate this course by investigating language instructors' perceptions about the mTPD course and their perceptions and knowledge about DGELL. For this purpose, this study employed Type 1 design and development research (DDR) methodology, which has been defined as "a systematic study of designing, developing and evaluating instructional programs, processes and products that must meet the criteria of internal consistency" (Seels & Richey, 1994).

In DDR studies, researchers investigate complicated problems where innovative ways could be utilized to promote the design, development, and evaluation processes (Richey, 1994). By using Type 1 DDR design, the researcher's aim in this study is to provide different prototypes in a cyclic process that contains analysis, design, development and evaluation phases and he aims to address his specific product by explaining all the steps in detail so that other researchers who are challenged by similar design and development projects can benefit from the conclusions of this study.

In this study, there are some steps that the researcher followed in line with design research principles (Reeves, 2006). Firstly, the researcher worked with practitioners collaboratively to determine the instructional problems. Then prototypes were developed in line with the existing design principles and innovative technologies. After the implementation of the first prototype, the product was tested in iterated cycles, and it was refined in practice. Lastly, implications of the study were reported to share experiences about the implementation cycles (Figure 3.1).
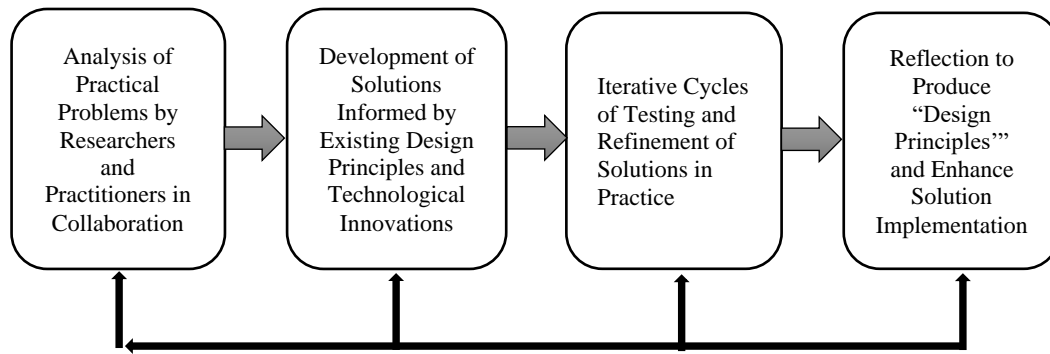
Figure 3. 1. Design Research Approaches in Educational Technology Research. Reprinted from "Design research from a technology perspective" by Reeves, 2006, In *Educational Design Research*. https://doi.org/10.1111/j.1467-8535.2008.00855_1.x

Richey, Klein and Tracey (2011) mentioned six major domains of instructional design in DDR studies. These are learners and learning processes, learning and performance contexts, content structure and sequence, instructional strategies, media and delivery systems and designers and design process (Figure 3.2). In this study, learners are the instructors and teachers who teach English in universities and state schools. Since one of the scopes of this study is to explore the potential of mobile learning in teachers' professional development, the context is limited to any learning context that is utilized with mobile devices. Content is limited to the use of digital commercial off-the-shelf games in language learning and teaching. Instructional strategies used in the mTPD course are self-directed learning, lecture with expert videos, discussion, and projects. Media consists of Schoology mobile application, expert videos, and articles. Finally, the designers are the researcher, an instructional expert and three other experts who contributed to the design with their video lectures.
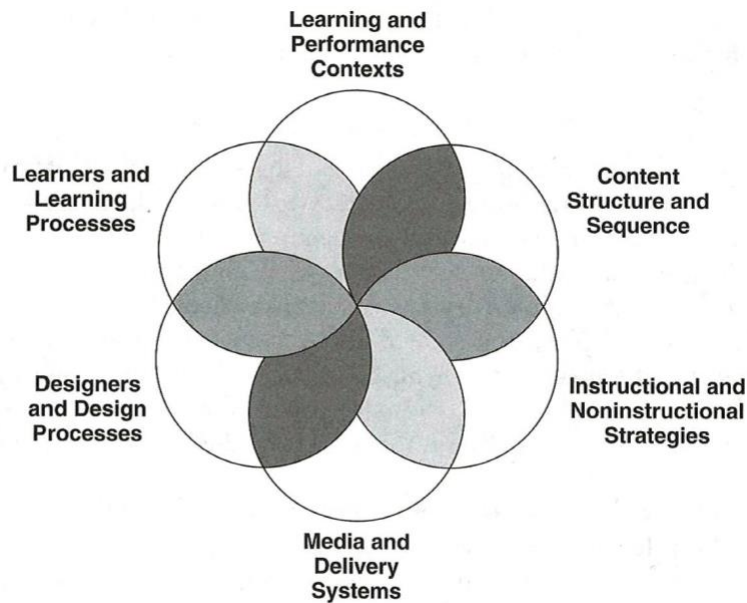
Figure 3. 2. Domains of the Instructional Design Knowledge Base. Reprinted from "The Instructional Design Knowledge Base" by Richey et al., 2011, Routledge.

This study will include a comprehensive evaluation of changes in participants' perceptions after the implementation of the mTPD program and their knowledge. The perceptions and knowledge of language instructors are considered to be essential for the instructional quality of the mTPD course design because (1) in order to better understand the effectiveness of the course from an in-depth perspective, investigating participant teachers' perceptions is necessary (Badri et al., 2016; Sixel, 2013) and (2) the depth of the teacher's knowledge about the subject matter is reported to be an important factor affecting student outcomes (Snow et al., 2005). With this new mTPD program, it is aimed to produce content-specific knowledge that serves a problem solving function (Richey & Klein, 2005) and the conclusions of the study are exclusively directed toward the target product and situation in which the study occurred.

3.3 Instructional Design of the Study

The instructional design of the study is based on the ADDIE instructional design approach (Davis, 2013). Since ADDIE represents a learner-centered approach and is a

frequently used model for technology-based teaching (Arkun & Akkoyunlu, 2008; Elliott, 2017), it is considered to be the most appropriate instructional design model for this study. The model basically consists of 5 steps, which are analysis, design, development, implementation, and evaluation. In the analysis step, instructional analysis is conducted to determine the goals of the program. A context and/or content analysis can be conducted in this step. In the design phase, performance outcomes and course objectives are created according to the goals determined in the previous step. The instructional topics, how much time will be devoted to each topic and the sequence of the topics are decided by the designers and the experts. In the development phase, learning materials and activities are created. In the implementation, the product is launched after the development is complete and it is distributed to the audience. In the evaluation phase, the program is evaluated to understand if the product is effective and the researcher cycles back to the previous steps if change is necessary (Gagne et al., 2004; Mckenney & Reeves, 2013). In this study, each step of the model was applied in all the prototypes (Figure 3.3) and they will be explained in detail in '3.4. Procedures of the Research' part.
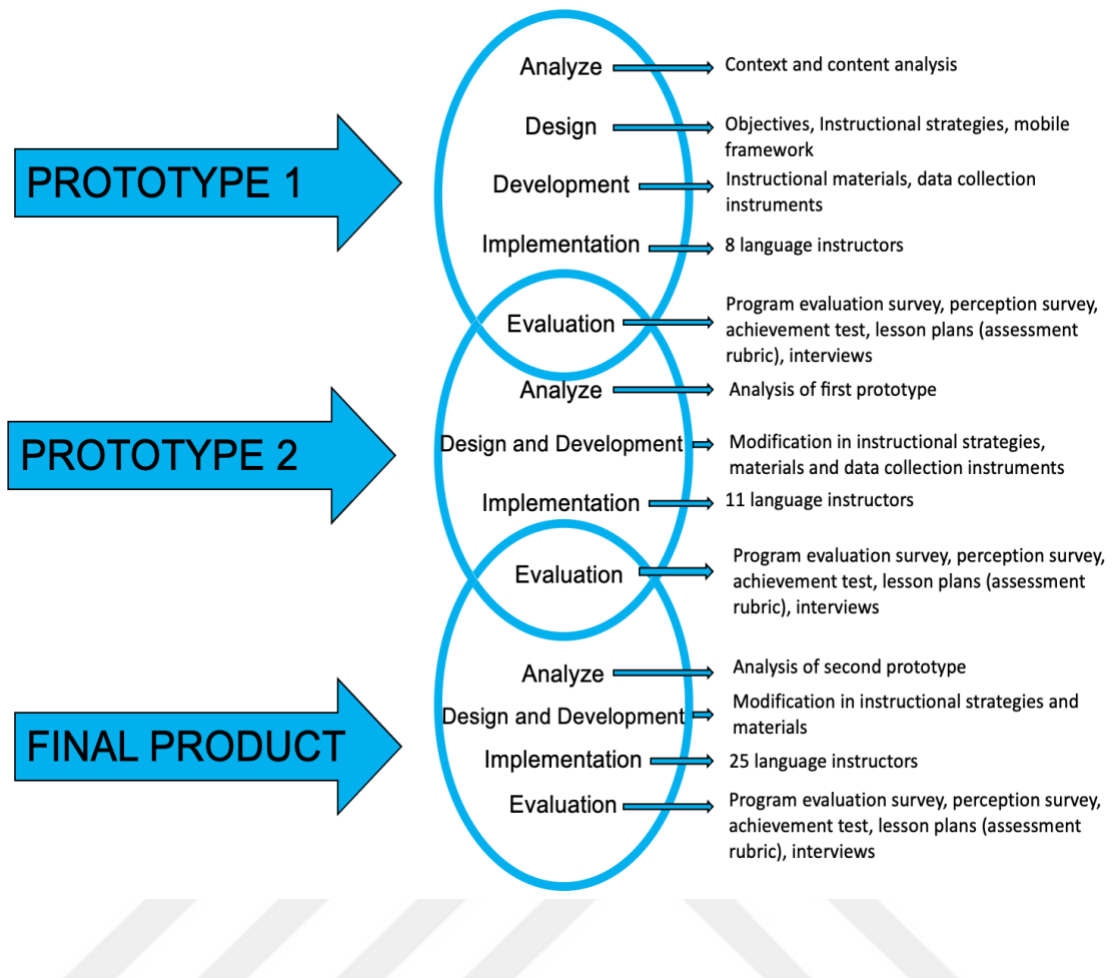
Figure 3. 3. Phases of the Study According to ADDIE model.

To develop the mTPD course, rapid prototyping approach was used with ADDIE instructional design model. Rapid prototyping method is a non-linear instructional design approach in which the designers create different samples of a product in different cycles to provide an understanding of how the course will work. By using rapid prototyping approach, designers minimize the challenges of ADDIE practices by including the learners into the course and asking them provide feedback that is essential for enhancing the effectiveness of the course (Jones & Richey, 2000). Rapid prototyping also lets the designers create courses that meets learner needs in a cost and time-efficient way. The iterative cycles of implementation help the learners and designers establish a cohort so that problematic areas of the course can be identified and fixed immediately (Gasper, 2003). The prototypes of our mTPD course ended after the second prototype because little modifications were needed at the end of second prototype. After the second prototype, the final version of the mTPD course was

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implemented to understand how effectively the mTPD course can fulfill language instructors' needs.

3.4 Participants and Research Context

3.4.1 Participants

The objective of this study is not to generalize the quantitative and qualitative findings of the study to the population from which the sample was selected; that's why the researcher didn't use random sampling in this study. By designing, developing, and evaluating an mTPD course on DGELL, the researcher aimed to obtain insights into this phenomenon, and he purposefully assigned participants for the prototype phases of the study to maximize his understanding of the underlying phenomenon. For the final product implementation, he worked with the language instructors working in a state university because they were accessible and convenient (Cohen et al., 2007). Since developmental research studies require different cycles of iterative implementations, three groups of participants were included in different implementation phases of this study. Convenient and criterion sampling strategies were used to choose available language instructors and teachers willing to participate the study. In criterion sampling strategy, participants are selected because they represent one or more criteria (Onwuegbuzie, 2007). There are two criteria for inclusion in this research:

1. Participants of the research should be teaching English as a second language in Turkey.
2. The medium of the mTPD course is mobile devices (mobile phones, tablets, laptops). Because of this fact, participants of the research should have at least basic level of skills to use technology and they should be able to perform basic functions in a limited number of applications in technological devices.

Sampling for Prototype 1. After designing and developing the mTPD course and asking for expert opinion, the researcher sent invitation emails to language instructors

working in 17 universities in Turkey, asking them to be volunteers to try the prototype of the course. A total of 16 EFL instructors from 8 universities responded to the email acknowledging that they wanted to participate in the study. Since there would be two different prototypes in the study, the group was divided into 2 groups and 8 instructors were assigned to the first prototype. The participants were all teaching English at the School of Foreign Languages department of 3 universities. The demographic information of the participants in first prototype is presented below (Table 3.1) and will be explained in detail in Chapter 4.

Table 3. 1

Demographic Information of the Participants in First Prototype

No	Gender	Experience	Level of Education	City	School
P1	Female	16 years and more	Masters	Istanbul	Bogazici University
P2	Female	16 years and more	Masters	Ankara	METU
P3	Female	16 years and more	Masters	Ankara	METU
P4	Male	16 years and more	PhD	Ankara	METU
P5	Male	4-10 years	Masters	Ankara	TED University
P6	Female	16 years and more	Undergraduate	Ankara	METU
P7	Female	16 years and more	Masters	Ankara	METU
P8	Female	11-15 years	PhD	Ankara	METU

Before the implementation, participants of the first prototype were asked to choose the level of ability that best described how well they were using technological devices (computer, tablet, smartphone, game console). There was only one participant who identified himself as a basic user while all the others identified themselves moderate (n=3), advanced (2), and expert (2).

The quantitative data from the pre-post tests and course evaluation questionnaire were obtained from all instructors having participated in the study. Two instructors didn't complete the post achievement test and their pre-test achievement test scores were

excluded from the analysis. Four instructors submitted their lesson plans at the end of the course. With respect to the interview phase of each implementation, 5 participants were purposefully chosen among the ones who were considered to be information rich (Patton, 2002) in order to extend understanding of the phenomenon. Informed consent was obtained from the participants before the implementation.

Sampling for Prototype 2. There had been 16 participants who wanted to participate in the prototypes before the first prototype and these participants had been divided into two groups. The implementation, analysis, redesign, and redevelopment phases of the first prototype lasted for about 5 months. Because of this fact, the other 8 participants who were reserved for the second prototype were contacted again and they were asked whether they would like to participate in the second prototype. 5 out of 8 participants expressed that they wouldn't be able to participate in the study due to their heavy workload and their private reasons. For this reason, to find more participants meeting the criteria for the second prototype, the researcher posted a participation invitation using Facebook, LinkedIn, and his professional network to reach out to language teachers who were interested in the subject matter.

In addition to 3 participants who were already available for the second prototype, 8 more language teachers/instructors volunteered to participate in the study. The participants were all teaching English as a second language in Turkish universities and state schools. The demographic information of the participants in second prototype is presented below (Table 3.2) and will be explained in detail in Chapter 4.

Table 3. 2

Demographic Information of the Participants in Second Prototype

No	Gender	Experience	Level of Education	City	School
P9	Female	1-3 years	Undergraduate	Istanbul	Turkey-Sweden Fellowship Primary School
P10	Female	11-15 years	Masters	Eskisehir	Eskişehir Technical University
P11	Female	0-1 year	Undergraduate	Istanbul	American Fine Art and Drama Preschool
P12	Female	16 years and more	PhD	Istanbul	Istanbul University
P13	Female	4-10 years	Masters	Istanbul	Istanbul Technical University
P14	Female	16 years and more	PhD	Ankara	Hacettepe University
P15	Female	4-10 years	Masters	Istanbul	Istanbul Technical University
P16	Female	4-10 years	Masters	Istanbul	Istanbul Technical University
P17	Female	16 years and more	PhD	Ankara	Hacettepe Üniversitesi
P18	Female	16 years and more	PhD	Canakkale	Çanakkale Onsekiz Mart University
P19	Female	4-10 years	Masters	Eskisehir	Eskisehir Technical University

Eight participants indicated their ability to use technological devices as moderate while three participants identified themselves as advanced users.

The quantitative data from the pre-posttests, and course evaluation questionnaire were obtained from all teachers/instructors having participated in the study. 9 participants submitted their lesson plans at the end of the course. With respect to the interview phase of each implementation, 7 participants were chosen purposefully to extend

understanding of the phenomenon. Informed consent was obtained from the participants before the implementation.

Sampling for the final product implementation. The participants in this phase of the study were composed of language instructors in the foreign languages school of Zonguldak Bulent Ecevit University. There were 55 language instructors working in the school and they were all sent an invitation to participate in the final product implementation. 25 language instructors who were teaching English at beginner and intermediate levels volunteered to participate in the study. The demographic information of the participants in final product implementation is presented below (Table 3.3) and will be explained in detail in Chapter 4.

Table 3. 3 (continued)

Demographic Information of the Participants in Final Product

No	Gender	Experience	Level of Education	City	School
P20	Female	16 years and more	Undergraduate	Zonguldak	Zonguldak Bulent Ecevit University
P21	Female	16 years and more	Masters	Zonguldak	Zonguldak Bulent Ecevit University
P22	Female	11-15 years	Undergraduate	Zonguldak	Zonguldak Bulent Ecevit University
P23	Male	16 years and more	Masters	Zonguldak	Zonguldak Bulent Ecevit University
P24	Female	16 years and more	Undergraduate	Zonguldak	Zonguldak Bulent Ecevit University
P25	Female	11-15 years	Undergraduate	Zonguldak	Zonguldak Bulent Ecevit University
P26	Female	16 years and more	Masters	Zonguldak	Zonguldak Bulent Ecevit University
P27	Female	16 years and more	Masters	Zonguldak	Zonguldak Bulent Ecevit University
P28	Female	16 years and more	Masters	Zonguldak	Zonguldak Bulent Ecevit University

Table 3. 3 (continued)

Demographic Information of the Participants in Final Product

No	Gender	Experience	Level of Education	City	School
P29	Female	11-15 years	PhD	Zonguldak	Zonguldak Bulent Ecevit University
P30	Male	11-15 years	Undergraduate	Zonguldak	Zonguldak Bulent Ecevit University
P31	Female	11-15 years	Undergraduate	Zonguldak	Zonguldak Bulent Ecevit University
P32	Female	16 years and more	Undergraduate	Zonguldak	Zonguldak Bulent Ecevit University
P33	Female	16 years and more	Undergraduate	Zonguldak	Zonguldak Bulent Ecevit University
P34	Female	16 years and more	Undergraduate	Zonguldak	Zonguldak Bulent Ecevit University
P35	Female	16 years and more	PhD	Zonguldak	Zonguldak Bulent Ecevit University
P36	Male	16 years and more	Undergraduate	Zonguldak	Zonguldak Bulent Ecevit University
P37	Female	16 years and more	Undergraduate	Zonguldak	Zonguldak Bulent Ecevit University
P38	Female	11-15 years	Undergraduate	Zonguldak	Zonguldak Bulent Ecevit University
P39	Female	11-15 years	Masters	Zonguldak	Zonguldak Bulent Ecevit University
P40	Female	16 years and more	Undergraduate	Zonguldak	Zonguldak Bulent Ecevit University
P41	Male	11-15 years	Masters	Zonguldak	Zonguldak Bulent Ecevit University
P42	Female	16 years and more	Undergraduate	Zonguldak	Zonguldak Bulent Ecevit University
P43	Female	16 years and more	Undergraduate	Zonguldak	Zonguldak Bulent Ecevit University
P44	Male	11-15 years	PhD	Zonguldak	Zonguldak Bulent Ecevit University

All participants had at least basic level of ability to use technological devices such as computers, tablets, and smartphones. All participants completed the pre-posttests and the course evaluation questionnaire. At the end of the course, 20 instructors submitted their lesson plans. 9 participants were chosen for the interviews purposefully to extend understanding of the phenomenon. Informed consent was obtained from the participants before the implementation.

3.4.2 Research Context

As the study was conducted during the COVID-19 pandemic, all universities and other school levels went online for the whole academic year. The participants of the first and second prototype implementations were teaching at different schools in different parts of Turkey and none of them had in-person classes during the study (Table 3.4). 16 instructors were teaching English in foreign language schools of Turkish state universities and one instructor was teaching in a private university. Two language teachers teaching in secondary education were also included in the prototype implementations. One of these participants was a language teacher at a state school while the other was teaching at a private school.

Table 3. 4

Distribution of Participants According to Their Context

PROTOTYPE 1		PROTOTYPE 2	
Participants in	n	Participants in	n
State universities	7	State universities	9
Private universities	1	Private universities	-
State school	-	State school	1
Private school	-	Private school	1

The implementation of the final version of the mTPD course was performed with 25 EFL instructors at Zonguldak Bulent Ecevit University, School of Foreign Languages. The school offers English preparatory courses to both undergraduate and two-year

degree students. The language instructors who participated in the study had just completed the online classes in the spring term when they started the mTPD course.

The Foreign Languages School has a Teachers' Professional Development Unit, which has been active since 2013. The unit offers new instructors orientations about various subjects such as classroom teaching skills and use of course materials. It also determines the professional development opportunities of instructors and organizes in-service training activities. The unit also contributes to the professional development of instructors by making classroom observations and offering feedback.

3.5 Procedures of the Research

This study includes two prototypes and a final product implementation. Each phase includes the analysis, design, development, implementation, and evaluation steps of the ADDIE instructional design model. Rapid prototyping was used in the prototype phases to test the course and make necessary changes to improve the quality of the course. All the procedures in each phase are explained in detail below.

3.5.1 First prototype

Analysis. The first prototype was designed according to the ADDIE instructional design model. The analysis phase of the instructional design typically focused on identifying what the language instructors needed to learn in the learning tasks. In this step, the researcher conducted a content and context analysis of the research context to decide on the topic of the professional development course. When the research context was analyzed, it was found out that needs analysis surveys had been given to the instructors for the last 4 years by the professional development unit in every academic year. By the help of these surveys, professional development needs of the instructors were being determined and the school was collaborating with the textbook publishers to arrange one-session workshops that were held during the breaks.

The researcher requested these data from the professional development unit and the findings obtained from all these needs analysis surveys provided some insights about the professional development needs of the language instructors. According to the survey results, language instructors had a positive opinion about getting professional development training on using technology-supported methods that the student could use to learn languages other than the methods they applied in the classroom. The instructors thought that they would benefit from this kind of a training. Most of the instructors also thought that it would be beneficial for them to get this training from experts in their field. In addition, most instructors had a positive opinion about taking an online course for professional development. Instructors also stated that it was important to establish a connection between real life and the class and to learn different techniques to increase students' motivation.

However, due to time and monetary constraints, these needs analysis findings haven't been effectively used to create sufficient professional development opportunities for the instructors so far. The researcher wanted to provide language instructors a consistent and pedagogically sound learning environment, so he searched for a standard tool. Based on the needs analysis survey data that was provided by the Professional Development Unit of the school, the researcher reviewed the literature to find innovative delivery medium to provide effective professional development opportunities to the language instructors and realized that mobile learning had a potential to overcome the challenges instructors experience in terms of cost, time, and budgetary limitations. Regarding the content of the professional development course, the researcher shared his analysis findings with a content expert who had a PhD in curriculum studies, and they worked on some possible topics that could be covered in the PD course. The researcher reviewed the literature again on these possible topics and eventually determined that this course could be designed to help instructors develop their knowledge on Digital Game-Enhanced Language Learning since digital games had a significant potential in language learning. It was decided that a professional development course on Digital Game-Enhanced Language Learning approach would be designed, and the course would be designed in accordance with a mobile learning framework to eliminate the time, cost and place limitations that language instructors confronted when they wanted to participate in these activities.

Design. This step helped to identify the skills and knowledge learners needed to be able to succeed, the instructional objectives and learning strategies to be applied and the mobile learning framework to be used in the professional development course. The researcher started with the skills and knowledge that learners needed to succeed.

As mentioned in the analysis step, the professional development needs and interests of the language instructors were identified and the next step was to decide what content would be included in the professional development course. The researcher decided on the topics by reviewing the relevant literature on using digital games in language learning. By the end of the course, participants would be able to;

- explain the role of digital games in language learning,
- identify some digital games and genres that can be used for language learning,
- indicate where language teachers and learners can reach out digital games for language learners,
- assess digital games for school content using TPACK framework,
- integrate digital games into classroom learning using PCaRD framework.

After deciding on the main objectives, topics were structured and sequenced in a logical fashion. The topics were divided into 4 units and each unit was divided into multiple modules to provide bite-sized chunks of new information. That minimized the challenge of remote learning and allowed learners to manage new subject in small pieces. Instructional objectives for each unit were developed using Bloom (1956)'s taxonomy of learning (Table 3.5).

Table 3. 5

Instructional Objectives of the mTPD Course

		By the end of the course, learners will be able to;
U 1	**M 1**	- distinguish the difference between Digital Game-Enhanced Language Learning and Digital-Game Based Language Learning, - identify the reasons why digital games are used for L2 learning, - explain the affordances of digital games in language learning.
	M 2	- distinguish the difference between Digital Game-Enhanced Language Learning and Digital-Game Based Language Learning, - identify the reasons why digital games are used for L2 learning, - explain the affordances of digital games in language learning.
	M 3	- play an authentic COTS game, - explain their opinions about the potential of using this game for language learning.
U 2	**M 1**	- identify the main factors that should be considered while choosing a learning material, - talk about the factors to consider when choosing a digital game for L2 learning, - give examples of some digital games and digital platforms for language learners who are beginners, more advanced players and those who don't like violence.
	M 2	- list 5 key considerations when choosing appropriate educational tools for their classrooms, - define TPACK, - explain differentiate domains used in TPACK, - explain how TPACK is used to choose digital games for school content.
	M 3	- explain how they can use different domains of TPACK model when choosing a digital game for school content, - assess a digital game for school content using TPACK model.
U 3	**M 1**	- give examples of the learning activities for different phases (pre-while-post) of game play, - identify the essential factors that makes Digital Game-Enhanced Language Learning more effective.
	M 2	- explain different phases of the PCaRD model, - identify the characteristics of ICCE framework, - analyze play, curricular activity, reflection and discussion phases of PCaRD model.
	M 3	- develop a lesson plan on Digital Game Enhanced Language Learning lesson using PCaRD model.
U 4	**M 1**	- identify some important questions that might arise when language instructors want to implement Digital Game-Enhanced Language Learning, - discuss some solutions to these questions with an experienced language instructor who implemented DGELL in a similar context before, - discuss how to implement this method in language instructors' own context with the other language instructors.

Cognitive Systems Approach (Biggs, 1993) was followed to sequence the content from theory to practice. In order to help language instructors accomplish the performance objectives, one essential step is to present theoretical information to carry out the learning tasks. This theoretical information links the gap between the knowledge of the language instructors and what they need to know to develop the complex skills they are learning. By the help of the theoretical information, language instructors were able to establish meaningful relationships between new information and their prior knowledge. In this study, language instructors were presented the theory first, and then they applied the theory to the learning task with different hands-on activities.

Instructional strategies are the techniques that are used to help learners gain a better understanding of the course (Weston & Cranton, 1986). Since the course was offered asynchronously, an individualized learning method was chosen as the learners were able to learn the new materials at their own pace and receive new knowledge while monitoring their own progress. Modularized instruction was the method that was used to create the instructional materials. In modularized instruction, the course is divided into small modules which are short in duration. Even though modularized instruction is very time-consuming and require instructional design expertise, it is a very flexible method and learners can work at their own pace. Besides readings, audio or visual materials can be used as learning resources (Weston & Cranton, 1986). While designing the course in this study, the content of each unit was broken into small, sequential modules. New information was presented to the learners with video lectures and readings. After learning the new information from these sources, they had to complete a task based on that new information.

Choosing a mobile learning framework was another task completed in the design process. The course was aimed to be designed appropriate for mobile learning pedagogies. Because of this fact, iPAC Framework (Kearney, et.al., 2012) was used to design the course to mediate mobile learning. iPAC Framework has three main pedagogical dimensions. These are personalization, authenticity, and collaboration. Each of these main dimensions are also divided into their sub-dimensions (Figure 3.4).
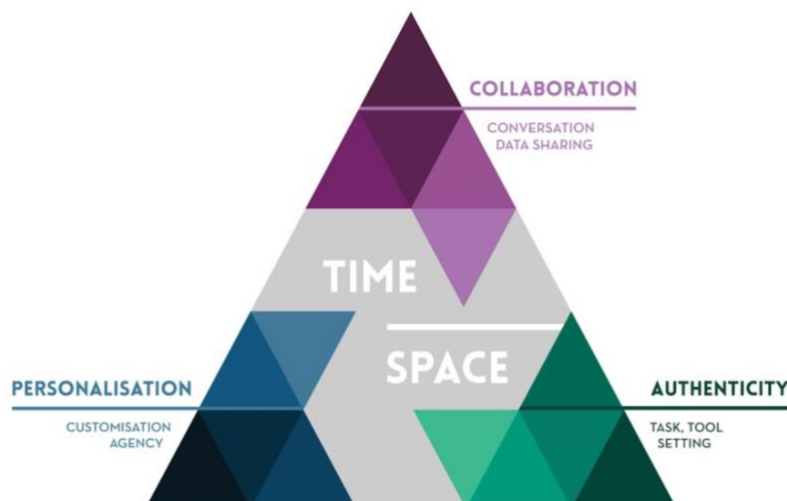
Figure 3. 4. iPAC Pedagogical Framework of Mobile Learning. Reprinted from "The iPAC Scale: A Survey to Measure Distinctive Mobile Pedagogies" by Kearney et al., 2019, *TechTrends*, *63* (6), 751–764.

Personalisation refers to the mobile learning activities where learners can control the place (in-person or online), pace and time they learn the instructional material. Learners can use mobile devices to record and reflect on their learning experiences and they are autonomous over the learning content. Authenticity refers to the realistic and authentic tasks in the learning activities which offer real-life scenarios to the learners. By using their mobile devices, learners can participate in contextualized learning activities. Collaboration refers to learners' use of socially interactive environments to communicate with their peers and their teachers. By the help of the collaborative tasks, learners are able to produce and exchange content and share information across time and place (Kearney et al., 2020). All learning materials were designed according to these dimensions (personalization, authenticity, and collaboration) of iPAC Framework.

Burden, et.al. (2017) created iPAC Evaluation Rubric to search for mobile apps which support mobile pedagogies. This rubric includes the three dimensions mentioned above and a set of pedagogical criteria specific to mobile learning. Using this rubric, mobile apps can be evaluated in educational contexts. Since the researcher was not a computer programmer, he didn't intend to create an application himself. Hence, he used this rubric to evaluate some learning management systems whose mobile apps

were likely to be used as a medium in the professional development course. Schoology, Google Classroom and Moodle were the three learning management systems with mobile apps that were evaluated. Moodle is a very popular software which offers many useful tools to the learners. However, since Moodle is an open-source software, the mobile app requires technical skills and experience to make your own Moodle server. The researcher tried to use Moodle at first, but he confronted with lots of technical problems, which he was not able to handle all by himself. Google Classroom and Schoology have many features in common, but they deal with these features in different ways. Google Classroom ensures an easy interface and smooth document sharing functionality. Learners can leave comments in several ways. It is also possible to create simple quizzes. However, when students submit an assignment, they become the document owners, which might lead to change the assignment content accidentally or purposefully. Most importantly, the mobile app of Google Classroom is simplistic, which lacks the functionality of the webpage format. Schoology, on the other hand, has a great deal of collaboration tools which include discussion forums, blog posts and announcements. It is possible to configure assessment and quizzes and its grading and annotation tools are very functional. The mobile app of Schoology is easy to use and duplicates its web functionality.

When both Schoology and Google Classroom mobile apps were evaluated with iPAC Evaluation Rubric, Schoology received 21 points while Google Classroom received 17 points. In the light of all this information, the researcher decided to use Schoology as the medium of the professional development course. There are some reasons why Schoology was chosen as the medium of this mTPD course. As a virtual learning environment for both K-12 schools and higher education institutions, Schoology was considered to be the most suitable mobile platform for this study due to its user-friendly interface, the variety of content (texts, multimedia, assignments, quizzes, discussion forums, badges) and administrative tools that enabled collaborative learning experiences. It is a free app and available in both Android and IOS platforms. For all these reasons, the mTPD course was thought to be delivered to the instructors with this application.

Development. After identifying the topics, instructional objectives, learning strategies and the mobile learning framework to be used in the mTPD course in the design phase, instructional materials were started to be developed. The mTPD course on Digital Game-Enhanced Language Learning was structured in three different parts. These are;

1. Welcome package
2. Instructional content (Unit 1-2-3-4)
3. Course reflection

In the first part, a welcome package was provided with the necessary information the language instructors might need before or during the course (Figure 3.5). The content in the welcome package was considered to be essential (1) to show the learners how they would work with the program, (2) to lay out expectations (3) to provide information about the designers and the program contributors and (4) answer the frequently asked questions when the learners confronted with a problem.
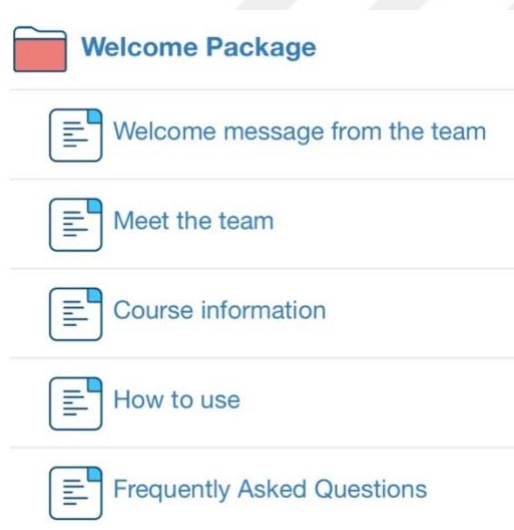
Figure 3. 5. Welcome Package from the Schoology App.

In the second part, the instructional content was organized according to cognitive systems approach (Biggs, 1993), i.e., from theory-to-practice. There was a total of 4 units in the course and each unit included three modules. The first two modules of each unit focused on the theoretical aspect of the new information. The theoretical information in these two modules were taught with either readings or video lectures

presented by subject matter experts. Learning the new information directly from the experts gave the learners access to trusted, reliable, and credible sources. The duration of each video and the reading time were kept between 3-10 minutes to keep the learners engaged and increase their attention span. There was a total of 11 video lectures in unit 1, 2 and 3 and the average video duration was 5 minutes 37 seconds. The average reading time of 3 texts in unit 1, 2 and 3 was 5 minutes.

The third module in each unit included two parts; (1) activities that the learners were able to use the theoretical information in practice and (2) a discussion forum (Figure 3.6). The 'Check your progress' part included two parts in which learners were able to rate their own learning and assess how much they learned the new content by doing an achievement test. At the end of each unit, extra readings and materials were presented to the learners who wanted to have further understanding of the content.

Figure 3. 6. Unit 1 on Schoology Mobile App.

The third part of the mTPD course included a course reflection. This part was designed to help learners think critically about what they learned and reflect on their experiences and learning (Figure 3.7).

Figure 3. 7. Course Reflection on Schoology Mobile App.

Developing content in Unit 1. Unit 1 was made up of 3 modules, check your progress part and extra sources (Figure 3.8). The first module started with a warm-up activity outlining the important facts about games and learning. This warm-up activity intended to prepare the learners for the new content. The new content was given in the Discover section with a reading and video lectures. The content of these materials included the theoretical information about what Digital Game-Enhanced Language Learning was, gave the reasons for using digital games for language learning and shared some research about using games in L2 learning.
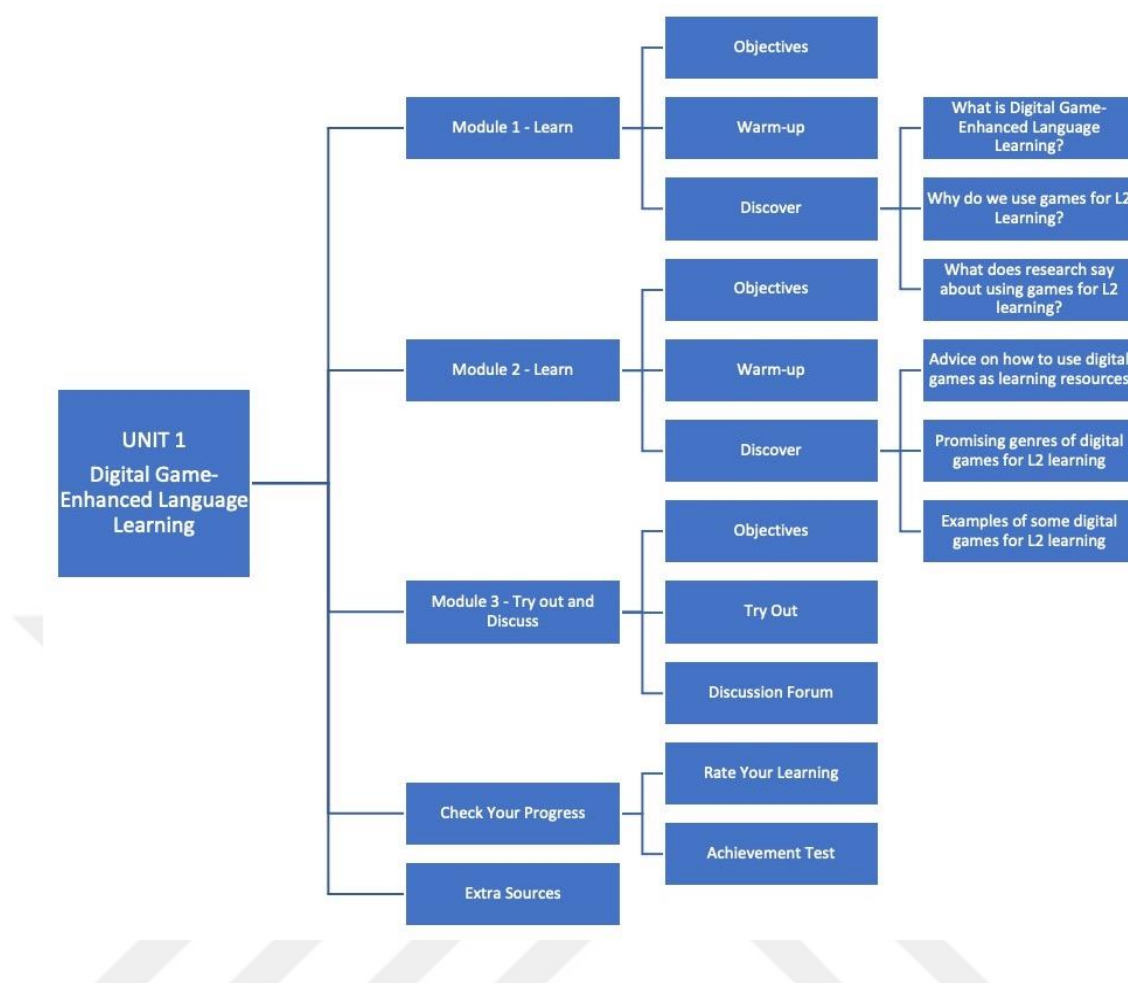
Figure 3. 8. Unit 1 Content Map.

The subject matter expert in Module 1 was Jonathon Reinhardt. He is an associate professor at Arizona State University and his research focuses on technology, especially with digital games in learning. Before starting to develop the instructional materials, the researcher sent an email to Professor Reinhardt asking for his contribution by sending a video lecture on the use of digital games in language learning. He sent a video lecture 35 minutes of length. The video was split into smaller parts according to their content and edited by the researcher with a video editing software. Module 1 includes two videos of these series. As mentioned in the design part, the video lectures and the reading were given with tasks that the learners were expected to complete after watching or reading. Instructions were also given in detail to help them submit their assignments (Figure 3.9).

Figure 3.9. Unit 1 Module 1 Video Lecture Task by Jonathon Reinhardt.

Module 2 followed the same sequence, starting with a warm-up activity and then three different tasks with video lectures by Jonathon Reinhardt. This module taught how to use digital games as learning resources, promising genres of digital games for language learning and examples of some digital games for language learning (Figure 3.10).
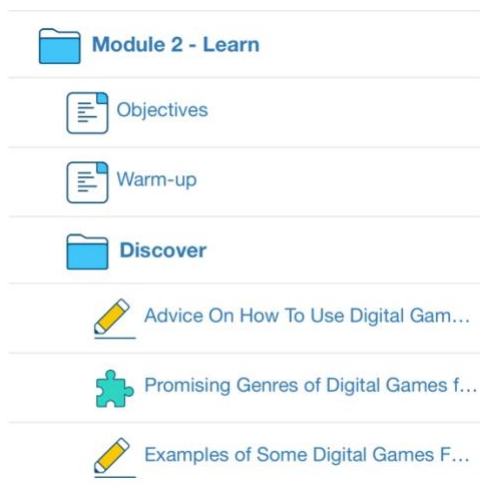
Figure 3. 30. Unit 1 Module 2 on Schoology Mobile App.

As mentioned earlier, the third module of each unit included try-out activities that the learners could use their new information in real life practice. This module also included a discussion forum where learners can interact with their peers in a communicative setting (Figure 3.11).

Figure 3. 11. Unit 1 Module 3 on Schoology Mobile App.

The try-out activity of the first unit included exploring a commercial off-the shelf game by playing it for a while and then writing a short reflection explaining how it could be used for language learning purposes. Step-by-step instruction was given to help learners download the game and submit their assignments (Figure 3.12).

Figure 3. 12. Unit 1 Module 3 Try-out Activity on Schoology Mobile App.

With the discussion forum activity, it was aimed to have the learners discuss with each other about the pros and cons of using digital games in the classroom and talk about their prior experiences related to the topic (Figure 3.13). To boost communication among the learners and provide a safe environment for everybody, different discussion facilitation techniques were prepared. For example, discussion forum principles were set to define expectations, an assessment rubric for participation in online discussion was prepared and the researcher decided to take an active role in the discussions by asking provoking questions.
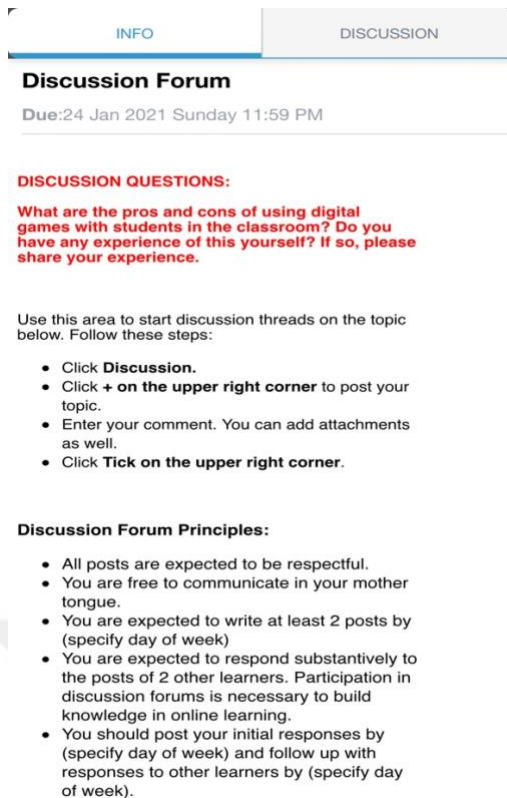
Figure 3. 4. Unit 1 Module 3 Discussion Forum on Schoology Mobile App.

After learning and practicing the new content, learners were able to assess how much they learned the materials by rating their own learning and doing an achievement test based on the content they had just learned. The items in the 'Rate My Learning' part were developed based on the instructional objectives and they were given with a 5 Likert type scale (Figure 3.14).

Figure 3. 5. Unit 1-Rate Your Learning on Schoology Mobile App.

Achievement test questions were based on the reading and the content taught by the subject matter expert. Questions included multiple choice, true/false, matching, ordering and fill in the blanks questions (Figure 3.15). They were validated by an expert before the prototype started.

Figure 3. 6. Unit 1 Achievement Test on Schoology Mobile App.

Developing content in Unit 2. In Unit 1, the researcher intended to give the learners a general understanding of what Digital Game-Enhanced Language Learning was and

teach them the theoretical underpinnings of this approach. In Unit 2, it was aimed to develop language instructors' skills to assess digital games for school content using TPACK framework. To do so, the types of knowledge that would constitute the knowledge base for teaching were taught with different modules and a hands-on activity (Figure 3.16).
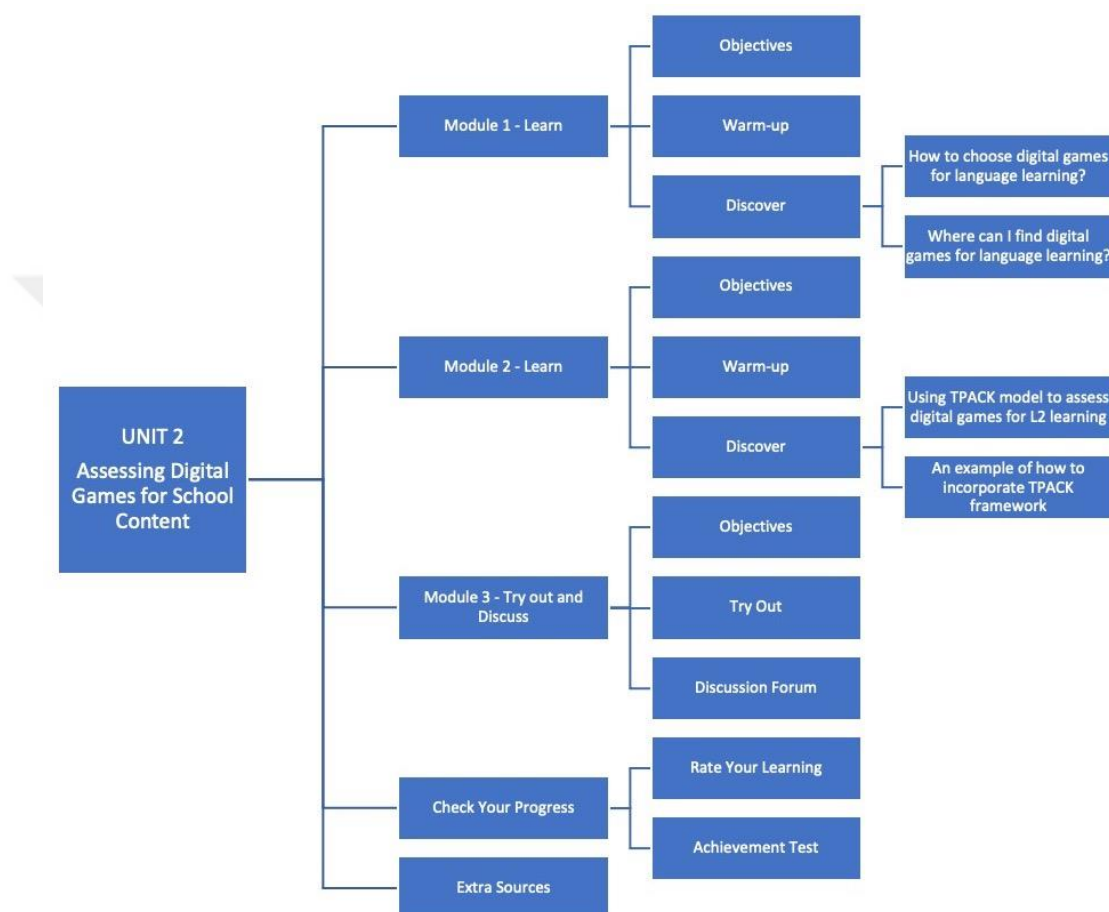
Figure 3. 7. Unit 2 Content Map.

The sequence of the content in this unit was the same as the previous unit. The warm-up task in Module 1 aimed to make learners think about the factors while choosing a learning material (Figure 3.17). This activity was considered to be an effective way to promote language instructors' interest to the new topic and help them establish a connection between their prior knowledge and the new information.
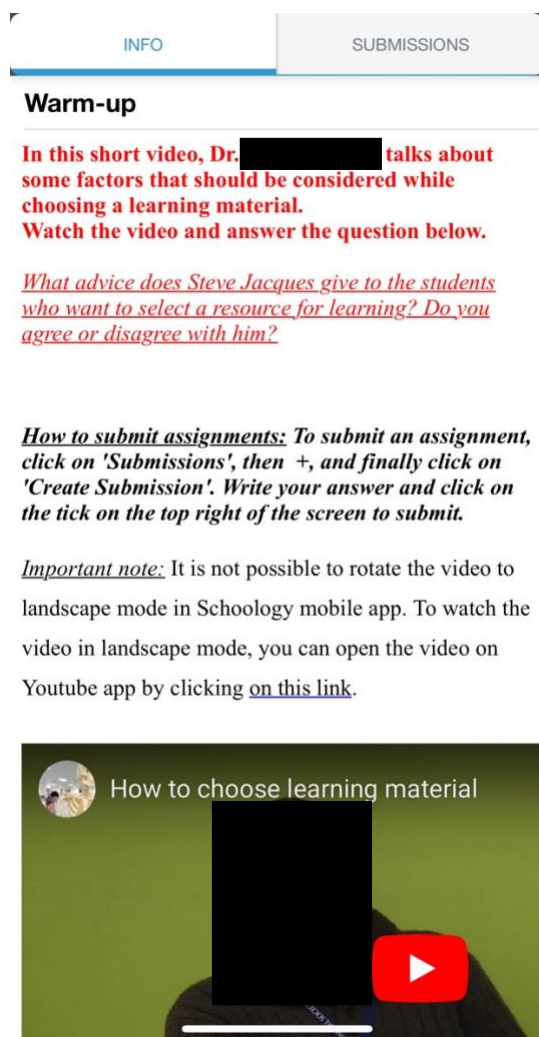
Figure 3. 8. Unit 2 Module 1 Warm-up Task on Schoology Mobile App.

The new content in module 1 was given with two video lectures taught by Jonathon Reinhardt. In his videos, he explained some of the things to consider while choosing a game and gave information about where to find digital games for language learning. The content of module 1 was an introduction to the main topic of the second unit. The main subject matter, TPACK Framework was taught in Module 2 by Diler Oner, who is a professor in Bogazici University (Figure 3.18). Her research focuses on designing, developing, and implementing computer-based tools and she has conducted research on TPACK Framework. She sent the researcher a video lecture on TPACK Framework in which she explained the types of knowledge that would constitute the knowledge base for teaching and how they could be used to assess digital games for school content. This video was followed by another task in which the learners were presented

an example of how to incorporate TPACK Framework into Digital Game-Enhanced Language Learning.
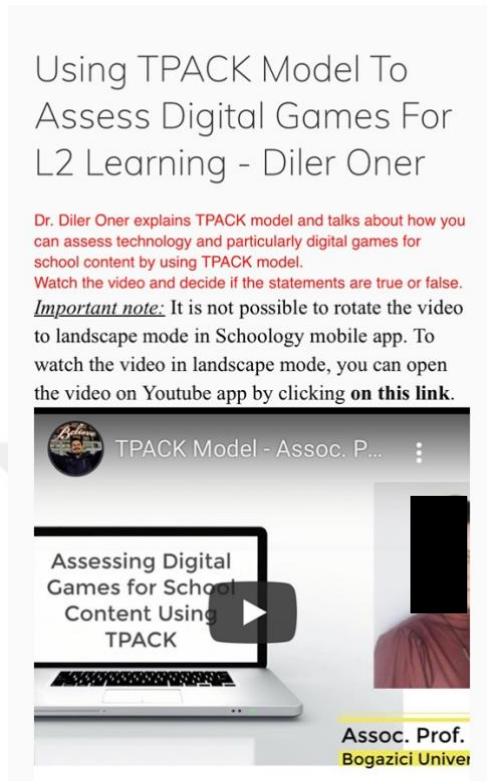
Figure 3. 9. Unit 2 Module 2 Video Lecture Task by Diler Oner.

In the Try-out task in Module 3, language instructors were asked to use the TPACK Framework to determine whether the digital game they played in 'Unit 1 Try-out' part could be integrated to their classroom activities. With this activity, the learners were expected to use the theoretical information they learned in a real-life scenario. In the discussion forum, the learners were given a list of different game genres and asked to discuss some questions based on these game genres. The same principles and elicitation techniques that were used in Unit 1 were included into the content of this discussion. 'Check your progress' and 'Extra sources' parts followed the same design principles that were applied in Unit 1.

Developing content in Unit 3. In Unit 3, the main objective was to introduce the language instructors the theoretical information of PCaRD model and show them how

to use PCaRD model to integrate digital games in language learning. As was the case with the previous units, the content was taught by following the same sequence of activities (Figure 3.19).
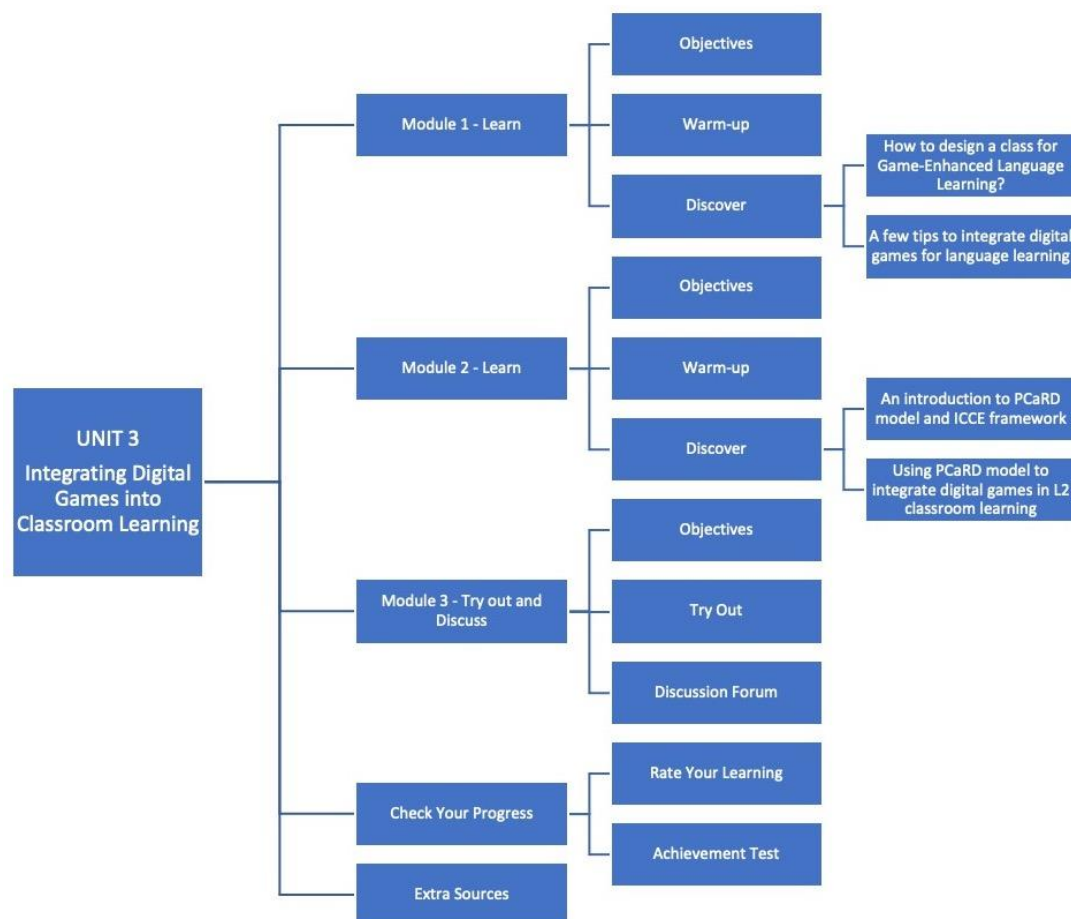
Figure 3. 19. Unit 3 Content Map

Module 1 started with a warm-up activity and then presented an introduction to the main content. In Module 1, Jonathon Reinhardt talked about the basic features of designing a class for Digital Game-Enhanced Language Learning and he gave some tips to integrate digital games into language learning. The main aim of this unit was to provide language instructors the necessary skills to integrate digital games into classroom by using PCaRD model. The content was taught in Module 2 by Aroutis Foster, who proposed PCaRD model in his research (Foster & Shah, 2015). Aroutis Foster is an associate professor in Drexel University, and he designs digital technologies such as games and virtual worlds. The researcher contacted Dr. Foster in

2019 and asked for his contribution with a video explaining how to use PCaRD model to integrate digital games into classroom learning. Dr. Foster accepted the invitation, and he sent a video. The researcher realized that the sound quality of the video was very bad, so he had to ask Dr. Foster to rerecord another video, which he noteworthily did in a short while (Figure 3.20).
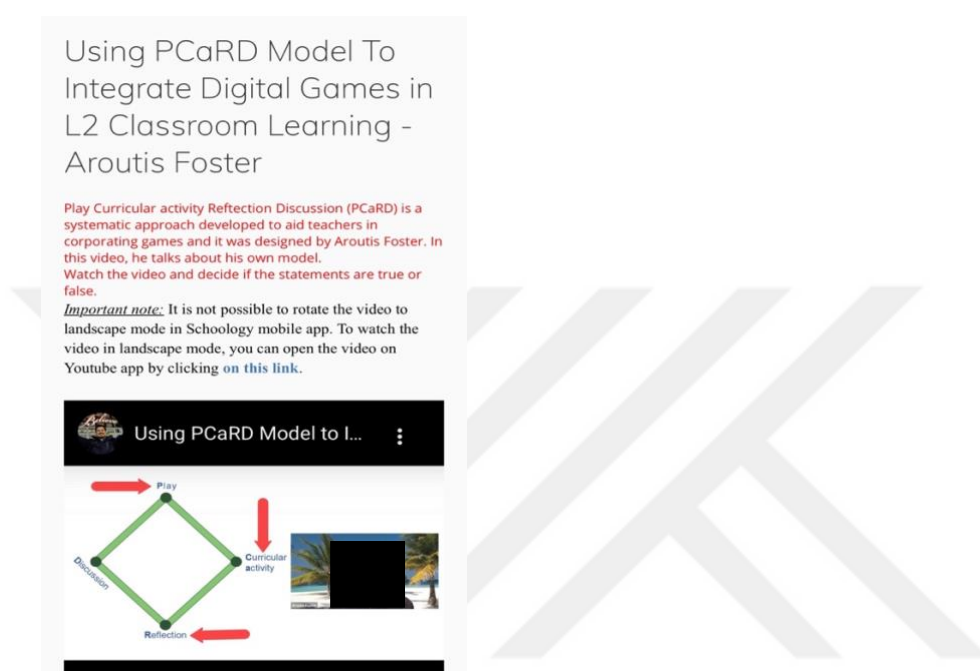
Figure 3. 10. Unit 3 Module 2 Video Lecture Task by Aroutis Foster.

The 'Try-out' task in this unit was a very essential part of the program since the learners were expected to produce a product in relation to the learning outcomes of the program. The learners were expected to design a lesson plan based on Digital Game-Enhanced Language Learning method. They were given a lesson plan template (Appendix A) and asked to integrate the digital game they were engaged with (Life is Strange) into classroom teaching using the PCaRD model. To assist the learners with some ideas, LAT activity types and sample curricular activities were presented in the task. Step-by-step instructions to make changes on the lesson plan and submit on a mobile device were stated clearly (Figure 3.21). After the Try-out task, Discussion Forum, Check Your Progress and Extra Sources parts were included in the unit.

INFO | **SUBMISSIONS**

Try-Out

You are expected to design a Digital Game-Enhanced Language Learning lesson using the digital game, 'Life is Strange', whose content and pedagogical approaches you are already familiar with.

The aim of the lesson will be to provide students with an alternative learning experience through the use of interactive learning environments.

Attached (or click here) you can find a lesson plan template for your use based on PCaRD model. Add your own ideas, develop an activity and then share your lesson plan in this topic.

Here, you can review LAT activity types that Diler Oner mentioned in Unit 2.

Here, you can see some activities that Seda Musaoglu prepared for her own classroom.

How to make changes on the lesson plan and submit on a mobile phone:

1- Make sure Google Drive and Google Docs are downloaded on your mobile phone.
2- Click on the link above (or here) and open the file with Google Docs.
3- Click on '...' at the top right of the screen, then 'Share&export' and 'Save as Google Docs file' (the file is 'view only' so you need to make your own copy)
4- Develop your lesson plan and share a link to your lesson plan here.

* If you aren't able to edit the document on your mobile phone, you can open the Drive link on your computer, make a copy of the file and follow step 4.

How to share the link to the lesson plan: To share your link, click on 'Submissions', then +, and finally click on 'Create Submission'. Copy and paste the link here and click on the tick on the top right of the screen to submit.

* If you are submitting on your computer, you can upload the lesson plan clicking on 'Submit Assignment' and 'Upload'.

Figure 3. 11. Unit 3 Module 3 Try-out on Schoology Mobile App.

Developing content in Unit 4. The content of Unit 4 was limited to the experiences of a practitioner who implemented DGELL method in her own classroom. Because of this fact, the content was not divided into different modules (Figure 3.22)
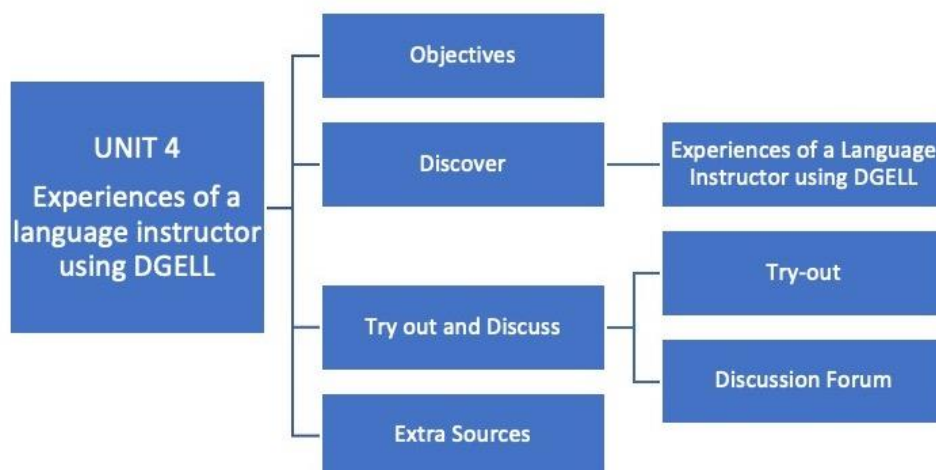
Figure 3. 12. Unit 4 Content Map.

Schwab (1969) stated that the main point that teachers care about with in-service training is whether the content of the program can be integrated to the actuality of their

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real classrooms. To provide a real-life example to the language instructors, they were introduced a practitioner researcher who implemented Digital Game-Enhanced Language Learning in her classroom. Based on the real-life experiences of the language instructor in Unit 4, the learners were aimed to see the connection between the contents of the mTPD program on DGELL and the real-life experiences they might encounter in an actual classroom. Seda Musaoglu Aydin, who is an EFL instructor in TOBB University, was interviewed by the researcher and she was asked ten questions about her experiences with Digital Game-Enhanced Language Learning. The questions are as follows:

1. Are you a tech expert? What is your game playing experience?

2. What kind of concerns did you have before implementing DGELL?

3. Did you ever worry that students might addicted to game playing?

4. What steps did you follow while choosing the right game for your students?

5. How did you integrate the digital game into your classroom learning?

6. How much time did you devote to the preparations? Was it worth it?

7. What are the limitations and problems you confronted in the whole process?

8. Do you think DGELL is applicable in your school's curriculum?

9. What would you do differently to improve the effectiveness of using this method in your classroom?

10. What advice would you give to help other language instructors improve their learning in this mTPD course on DGELL?

The interview lasted for 21 minutes 11 seconds. As well as the full-length video, the questions were also given as separate videos since the video was too long (Figure 3.23). The learners were expected to make note of their questions while listening to the interview as they would be able to discuss these questions with Seda in the discussion forum.

Experiences of a Language Instructor on DGELL – ▮▮▮▮▮▮▮▮

Q1: ARE YOU A TECH EXPERT? WHAT IS YOUR GAME PLAYING EXPERIENCE?

(1 min 17 seconds)

Click on this link to open this video on Youtube app.

Q2: WHAT KIND OF CONCERNS DID YOU HAVE BEFORE IMPLEMENTING DIGITAL GAME-ENHANCED LANGUAGE LEARNING?

(1min 19 seconds)
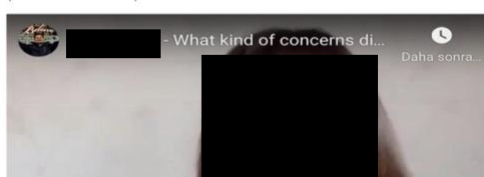
Figure 3. 13. Interview with Seda Musaoglu Aydin in Unit 4.

In the Try-out task, learners were expected to implement the lesson plan they created in the previous unit in their own classes. After the implementation, they were supposed to reflect on their experiences based on the questions given below:

1. What aspects of your lesson were implemented differently than you planned? Why did it happen?
2. If you were going to teach this lesson to the same group of students, what would you do differently? Why? What would you do the same?
3. What surprised you in your lesson?
4. Describe an instance or particular encounter that comes to mind. Why did you pick that instance?

Implementation. Implementation of the first prototype was carried out with language instructors from different universities. The researcher sent invitation emails to the language instructors from 17 Turkish universities to take part in the prototype implementations. 8 instructors from 3 universities participated in the first prototype.

The implementation took place from 20 January 2021 to 10 February 2021. The researcher had to extend the 10-day duration because the participants couldn't complete the course due to their heavy schedule and some the challenges because of the pandemic. Instructors were invited to attend the orientation before the implementation and the researcher gave necessary information about what was expected from the instructors in the implementation and how they could access the course. This orientation was also made available online so that the instructors could access it at a time that was convenient to them. During the implementation, the researcher sent regular emails to the learners about necessary information, such as the deadlines and the survey reminders.

Evaluation. Evaluation of the mTPD course was vital towards the effectiveness of the program. By the help of the data obtained from the instructors, the researcher would be able to improve the effectiveness of the course by making the necessary changes. Data were collected from the participants through course evaluation questionnaire (Appendix B), using digital games in teaching questionnaire (Appendix C), achievement test (Appendix D), lesson plan assessment with rubric (Appendix E) and interviews (Appendix F). To improve the mTPD course and ensure that all aspects of the program are likely to produce success, continuous feedback and data was provided in different prototypes and the final product with formative and summative evaluation.

The evaluation model used in this study was CIPP evaluation model (Stufflebeam, 1968). CIPP model includes four elements: C-Context, I-Input, P-Process and P-Product. Context evaluation is conducted to determine the needs of the program. Input evaluation is conducted to understand what resources are needed to create an effective program. Process evaluation is conducted to determine how well the implementation of the program is executed. And lastly, product evaluation is used to understand the impact of the program. In this study, the evaluation phase has two purposes; to understand what is working well and what is not in the mTPD course and to understand if the mTPD course is succeeding. Because of this fact, the process and product elements of the evaluation model were included in our evaluation phase. The related research questions are categorized according to the model as follows:

<u>Process</u>

1. What are the perceptions of the language instructors about the content, usability, and effectiveness of the mobile teacher professional development course on Digital Game-Enhanced Language Learning?

<u>Product</u>

2. Are there any differences between language instructors' perceptions about the affordances of DGELL and their behavioral intention to use DGELL before and after the use of mobile teacher professional development course?

3. To what extent does the mTPD course on DGELL contribute to language instructors' knowledge on DGELL?

The evaluation process included varied evaluation activities being conducted before and after the implementation of the mTPD course. Before the implementation, the language instructors were sent the using digital games in teaching questionnaire and the achievement test. They were requested to complete and submit these questionnaires before they started the course. The aim of this step was to understand their existing knowledge about the subject matter and their perceptions towards DGELL. After they finished the course, they were given the same questionnaires along with a course evaluation questionnaire. To understand how the course affected the participants' knowledge, lesson plans were analyzed using a rubric (Appendix E). After analyzing the data of these instruments, randomly selected 5 instructors were invited to have interviews to have a deeper understanding to their opinions about the course. The interviews were conducted on Zoom video call and they were recorded in both audio and video format with the instructors' consent. The quantitative and qualitative analysis and the results of these findings were explained in Chapter 4 in detail.

3.5.2 Second prototype

Analysis, Design and Development. After analyzing the data obtained from the participants, the researcher identified the parts of the course that needed to be changed or modified. He reviewed these parts of the course with an expert, and they agreed on

how they would make the modifications and additions in content and design of the mTPD course. The parts of the course that needed to be redesigned and redeveloped are summarized below.

- Lesson Plan Assignment. The lesson plan assignment in Unit 3 Try-out part was given with instructions and a lesson plan template. However, some of the participants mentioned that they needed more guidance and a sample to structure their lesson plan. Because of this fact, a sample lesson plan was created by the researcher and added to the content of this task. The main aim for doing so was to provide the participants a meaningful input so that they could prepare a lesson plan relating their teaching experience to what they had just learned in the mTPD course. Additionally, instructions were revised to make it clearer for the participants to understand what was expected in the assignment (Figure 3.24).
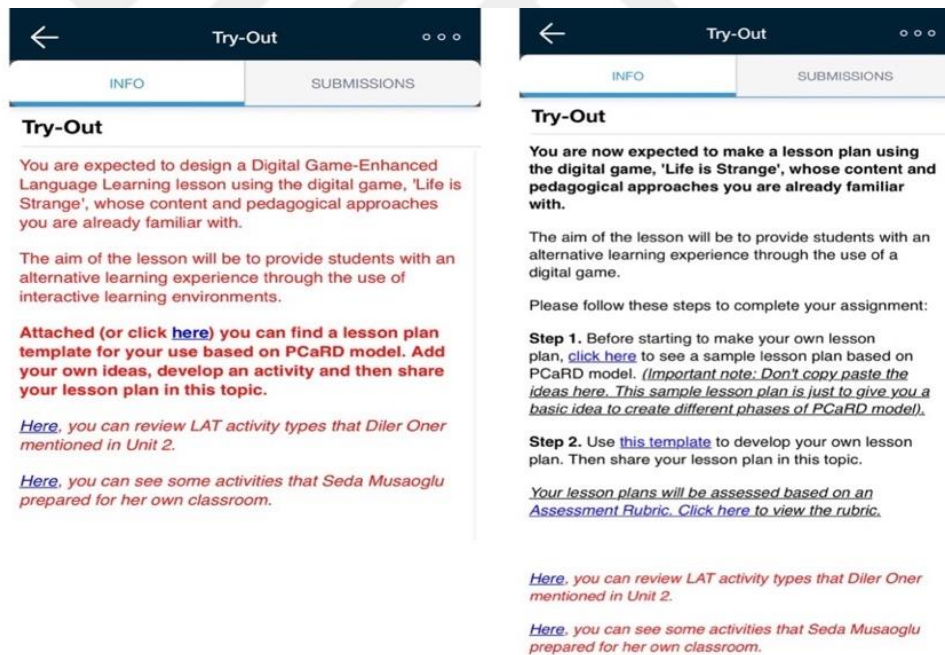
Figure 3. 14. Unit 3 Try-out Task in Prototype 1 and 2.

- <u>Discussion Forums.</u> Discussion forums weren't effectively used in the first prototype and learners stated negative opinions when they were asked what they thought about the discussion forum activities. The researcher was prepared for facilitating the discussion among learners with various methods, but participation was limited. As an alternative, the researcher decided not to use discussion forums in the second prototype implementation. As an alternative, he included 'Ask your questions here' part right after the modules in every unit (Figure 3.25). In this part, learners were supposed to ask their questions related to the content they had just learnt and interact with both the instructor and the other learners in an authentic way. This part was aimed to make learners feel that they were receiving individual attention they needed from the instructor.
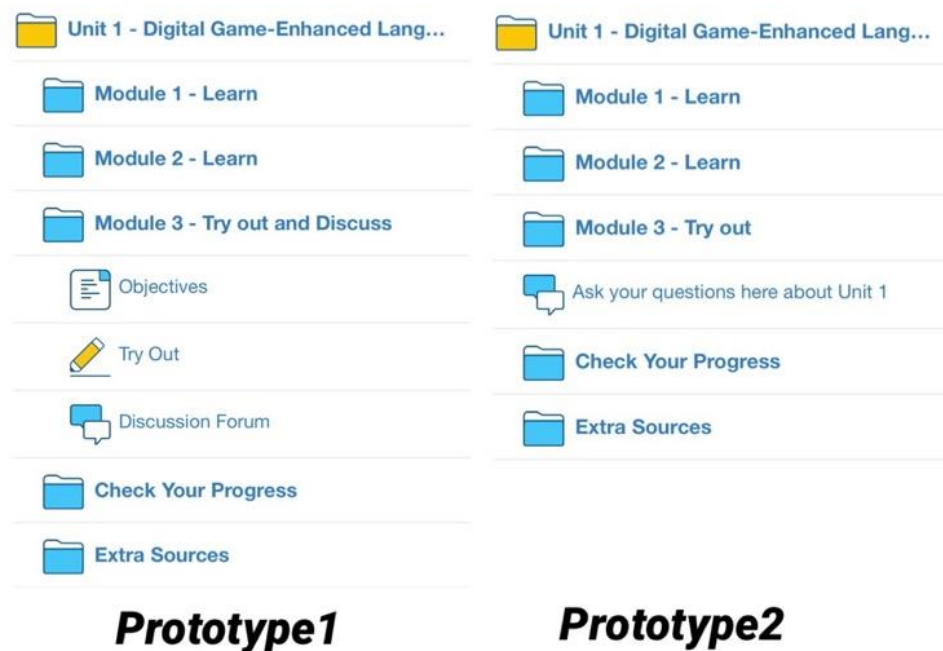
Figure 3. 15. Unit 1 in Prototype 1 and 2.

- <u>Game playing.</u> Learners were expected to play a digital game in the Try-out task in Unit 1 but some of the learners couldn't play because of various reasons. They needed alternative ways to complete the task. As an alternative to asking

the learners to play the game, the researcher added a walkthrough video so that the learners would be able to watch another person playing the game from the beginning to the end (Figure 3.26).
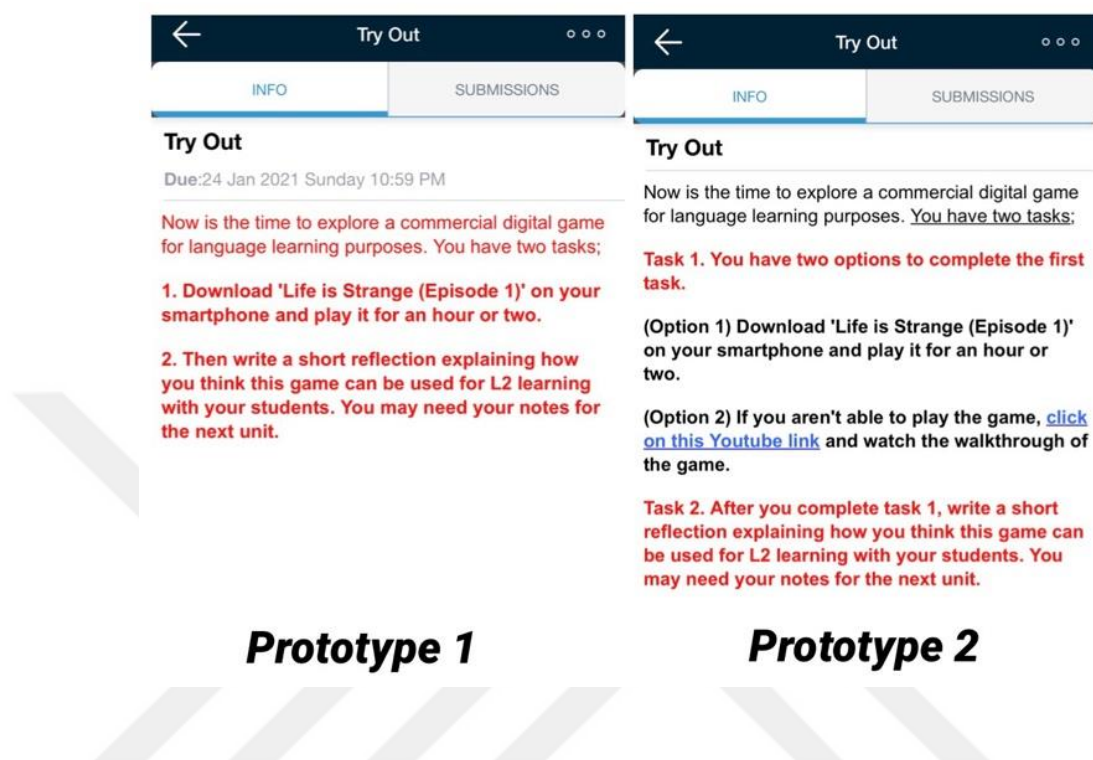
Figure 3. 16. Unit 1 Try-out Task in Prototype 1 and 2.

- <u>Navigation.</u> After taking a break and getting back to studying, learners had problems in finding their way in the menus. To help learners navigate their way through the menus easily, the researcher added a 'Course map' into the course (Figure 3.27). The course map included a visual diagram of all the content in each unit.
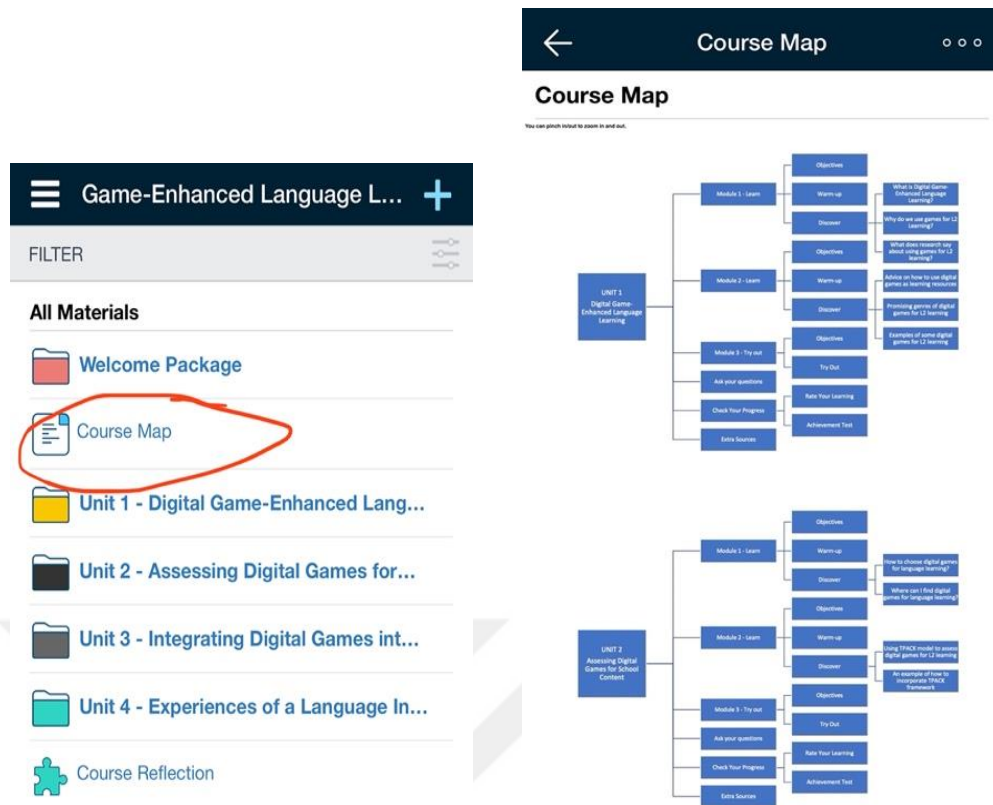
Figure 3. 17. Course Map.

- <u>Achievement test scores.</u> Learners were not able to see their scores when they submitted the tests. Step-by-step instructions were added in achievement tests to help learners see their scores once they submitted their answers. The instructions were also added to the Frequently Asked Questions (FAQ) menu.

- <u>Contacting the instructor.</u> Learners wanted to reach out to the instructor to ask a question, but they couldn't locate his contact info in the menus. The researcher added 'Ask me' menu in the Welcome Package and 'Ask your questions' menu in each unit. In the first prototype, it was observed that the instructor should be easily accessible when the learners wanted to contact to the instructor for help or guidance.

- <u>Mobile devices.</u> In the first prototype, learners were told that they were expected to study from their mobile devices in the orientation meeting but some of the learners studied only on their mobile phones, which gave them a

hard time because of the small screen size. Before starting the second prototype, the researcher held an orientation meeting and gave a clear explanation about the types of mobile devices the learners would be able to use, which included not only mobile phones but also tablets, netbooks and laptop computers.

- <u>Attempts.</u> Learners were able to make 5 attempts to complete each task. Some learners stated that they had to go back to the tasks and review several times to check their understanding, but the program didn't let them since they exceeded their attempt limits. The researcher changed the setting to maximum attempts so that the learners would be able to review and redo the tasks as many times as they could.

- <u>Length of sentences.</u> Some sentences in achievement tests were very long, which made it difficult to read on a mobile phone. All the items in the achievement tests were reviewed and long sentences were revised for practical use on mobile devices.

- <u>Course duration.</u> In prototype 1, learners were expected to complete the course in 10 days. However, because of their schoolwork and the pandemic situation, they had problems in time management and needed more time, especially for unit 3 and 4. Additionally, each unit was published every other 2 days and some learners stated that they would prefer to see the whole content and set their own pace individually. Given the circumstances, the researcher decided to extend the course duration to 15 days for prototype 2. He also published the whole content at the beginning and let learners set their own pace between the units.

- <u>Positive reinforcement.</u> Learners stated that they felt the lack of reinforcement and this problem sometimes caused lack of motivation as they were studying the content. In prototype 2, the researcher wanted to engage and motivate the learners in three different ways. Firstly, he created badges 'Bravo' for each unit and 'Star Performance'. He observed learners' progress every day and gave them badges based on how much they completed the tasks (Figure 3.28).

Figure 3. 18. Badges on Schoology.

Secondly, the researcher created a 'Course Completion Sheet' and made it accessible to the learners to let them know that their progress was being monitored (Figure 3.29). The table was being updated daily and reminders were sent to those who were left behind. They were offered assistance in case they were having a problem with the course.

Figure 3. 29. Course Completion Sheet.

Implementation. Implementation of the second prototype was carried out with 11 language instructors from different schools from 25 March 2021 to 20 April 2021. The normal deadline of the course was April 10th but some participants had the same challenges that the participants in prototype 1 experienced so the researcher had to extend the deadline for the learners who requested deadline extension. The instructors were invited to attend the orientation before the implementation and the researcher gave necessary information about what was expected from the instructors in the implementation and how they could access the course. This orientation was made available online and additionally the link to the video was added to Welcome Package on Schoology so that the instructors could access it at any time that was convenient to them. Same procedures were followed during the implementation, such as sending regular emails to the learners about necessary information, eg. the deadlines and the survey reminders and keeping them updated about their progress.

Evaluation. The researcher followed the same procedures he followed in the first prototype evaluation. He aimed to evaluate the second prototype of the course by collecting data with the interviews, course evaluation questionnaire, perception questionnaire, achievement test and lesson plan assessment. The data obtained from these instruments were analyzed and modifications to the second prototype were made which were explained in detail in the final product phase. The quantitative and qualitative analysis and the results of these findings were explained in detail in Chapter 4.

3.5.3 Final product

Analysis, Design and Development. Analyzing the data obtained from the participants in prototype 2, the researcher identified the parts of the mTPD course that needed to be changed and redeveloped.

- Difference between DGELL and DGBLL. Learners stated that the difference between Digital Game-Enhanced Language Learning and Digital Game-Based Language Learning was not given clearly in Unit 1, and they had to search for

more information online. The researcher reviewed the literature about DGELL and DGBLL and redeveloped the article with new content highlighting the difference between these two concepts.

- Sample Lesson Plan. In the implementation phase of prototype 3, the researcher added only one sample lesson plan to the Try-out task in Unit 3, but the learners stated that they needed to see more samples focusing on different language skills. This was a controversial decision because the sample lesson plans might cause too much guidance which might hinder learners' productivity. On the other hand, when an assignment is given, it is also necessary to give clear instructions and perform a sample of the work you are asking the learners to do. Because of this fact, the researcher made use of the lesson plans prepared by the participants in prototype 2. A content expert reviewed the lesson plans and three of these lesson plans were shared which focused on grammar, reading and vocabulary in the final product of the mTPD course.

- Lesson Plan Assessment Feedback. Learners in the second prototype stated that feedback to their lesson plans should be given shortly after they submit their lesson plans because it is likely that they forget most of the things if they wait for a long time to receive the feedback. This problem happened in prototype 2 because the researcher analyzed the quantitative data first to determine what aspects of the course he would focus during the interviews. Since quantitative data collection and analysis phases took longer than anticipated, he sent the feedbacks almost 20 days after the completion of the course. The researcher revised his sequence of tasks in the final product implementation and gave priority to giving feedback to the learners about their lesson plans.

- Sample Game (Life is Strange) Game Scripts. Learners stated that it would be practical if the scripts of the game were given in the Try-out task in Unit 3. In this task, they were supposed to create a lesson plan using this game and they wanted to make use of these scripts to create learning activities. The researcher

found the scripts of the game on the internet and added them to the content of the course.

- Course Duration. In prototype 2, half of the participants completed the course in the specified duration (15 days) but the other half requested deadline extension because of their personal and professional reasons. The researcher had a difficulty to keep up with the progress of latecomers in both prototypes and he decided to extend the duration of the final product implementation to one month. Learners would have 5 days to finish each unit and they would have more than a week to prepare their lesson plans. They might even practice the lesson in class if circumstances permit.

- Publishing each unit periodically. In prototype 1, each unit was published every other 2 days to prevent learners from falling behind the other learners. In prototype 2, the whole content of the course was published at the beginning to let learners move at their own pace. During the interviews after prototype implementations, some participants reported that they needed specific deadlines for each unit to help them maintain their self-discipline in asynchronous learning environments. For the final product implementation, the researcher decided to publish each unit every other 5 days.

- Discussion Forums. The researcher tried multiple techniques to facilitate interaction among the learners in prototype 1 and 2. In the first prototype, a discussion forum was included in each unit and learners were expected to discuss on a given question with their peers asynchronously. In the second prototype, discussion forum was eliminated and 'Ask your questions here' tool was included in each unit. It was observed that participation was very limited in those activities in both prototypes. Participants shared 6 posts in Prototype 1 and 13 posts in Prototype 2. The researcher reviewed the literature more thoroughly and investigated other online professional development trainings which included asynchronous discussion activities in their programs. Grade participation in online discussion forums is an effective way to promote meaningful interaction among learners (Smith, 2008; Solan & Linardopoulos,

2011). If a rubric is prepared and the participation of learners to the discussions are assessed with this rubric, the extrinsic motivation for students to participate in the discussions can be provided (Tasgin & Tunc, 2018). The researcher worked with an expert to create the discussion forum participation assessment rubric and he included the discussion forum back in the content in each unit (Figure 3.30). However, unlike the first prototype, he asked the learners to use their first language (Turkish) to participate in the discussions, supposing that they would feel more comfortable that way. He also set two requirements: (1) the learners were expected to post at least 1 question or comment, and (2) the learners were expected to respond substantively to at least one other post. Owing to the improvements made after Prototype 2, participation to the discussion forums increased in final product and participants shared 161 posts in the forums.
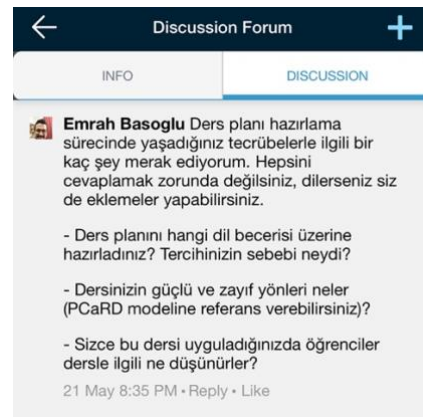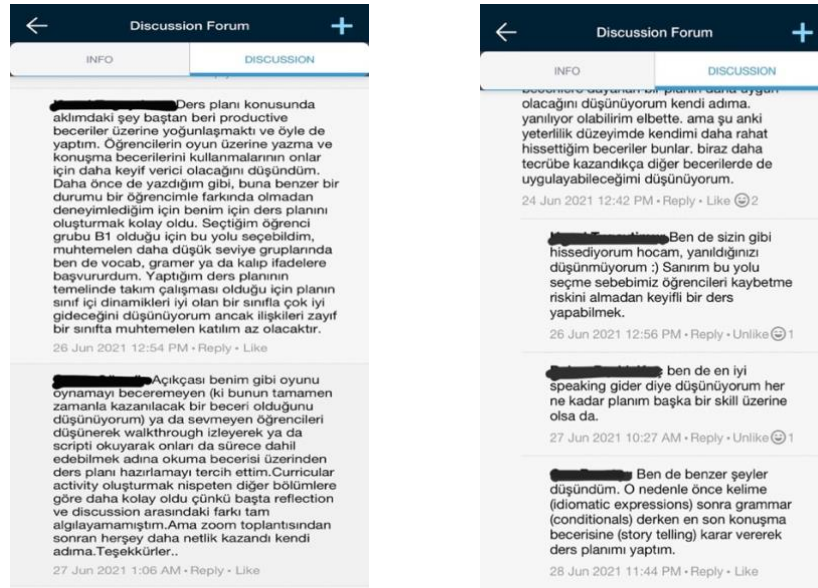
Figure 3. 19. Discussion Forum in Final Product.

- <u>Live Zoom Session.</u> Learners stated that they sometimes needed some interactive feedback on their progress and they wanted to ask some questions when they experienced some issues, especially in the lesson plan preparation phase and they didn't want to post their questions on Schoology as they needed a real-time support. Lowenthal, et.al. (2017) stated that synchronous live meetings can be useful in asynchronous online courses, and they gave some recommendations about how to support effective use of live sessions. The researcher decided to hold a 1-hour synchronous interaction online in the third week of the course and make use of these recommendations in the live session. The time for the live session was scheduled to the third week of the course as the learners would be engaged with preparing their lesson plans at that time and they would be able to ask their questions related to their assignment to the instructor. Attendance was optional and 20 instructors participated in the Zoom meeting. At the beginning of the meeting, instructors were split into small groups, and they were sent to breakout rooms to discuss their experiences and come up with some questions that they would share with other groups. When they came back to the main room, one member from each group shared their questions and the researcher facilitated a whole-group discussion based on

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these questions. The live session lasted for 48 minutes, and the recording was uploaded online for the participants who were not able to attend the meeting.

- Course Syllabus. With the recommendations obtained from the learners in prototype 2, the researcher prepared a detailed course syllabus (Appendix G) outlining what is expected to transpire during the course. The syllabus includes information about the instructor, required materials, course objectives, description and organization of the course and content. The researcher shared the syllabus with the participants before the final product implementation to introduce the course and communicate all the necessary information to the learners.

- Modification of minor mistakes. The flaws and mistakes that were experienced by the learners in the second prototype were fixed in the final product. These include typos, assignment settings, visual design, a wrong answer in a True/False activity, checking external links, etc.

Implementation. After the researcher made the changes in the second prototype, he ended the rapid prototyping procedure and implemented the final version of the mTPD course with the language instructors of a state university in Turkey. He invited all the participants to participate in the professional development course and 25 of them agreed to participate voluntarily. The researcher distributed the course syllabus 10 days before the starting date and gave them the perception questionnaire and the achievement test to complete before they started the course. On May 31st, he held a live Zoom orientation meeting with the participants and gave them the necessary information about how to access the course. The following day, they started the course and the implementation finished on the last day of June. The researcher held a live session in the third week of the program to answer participants' questions and have an exchange of ideas and reflections. Participants stated that the session was very fruitful, and it helped them shape their ideas about the lesson planning assignment. After the course ended, the course instructor sent his feedback on the lesson plans that the participants submitted. He then collected the quantitative and qualitative data as he did in the first and second prototype.

3.6 Data Collection

This study was conducted using design and development research methodology and it includes both quantitative and qualitative data collection methods. Data was gathered from different resources to triangulate the findings (Creswell, 2014). Course evaluation questionnaire (Appendix B), using digital games in teaching questionnaire (Appendix C), achievement test (Appendix D), lesson plan assessment with rubrics (Appendix E) and interviews (Appendix F) were used as data collection instruments. Table 3.6 shows the summary of research questions and data collection process. Detailed information about the data collection tools is explained in the following parts.

Table 3. 6 (continued)

Summary of Research Questions and Data Collection Instruments

Research Questions	Data Source		
	Prototype 1	Prototype 2	Final Product
1.1. What are the perceptions of the language instructors about the content of the mTPD course on DGELL?	Course Evaluation Questionnaire, Post Interviews	Course Evaluation Questionnaire, Post Interviews	Course Evaluation Questionnaire, Post Interviews
1.2. What are the perceptions of the language instructors about the usability of the mTPD on DGELL?	Course Evaluation Questionnaire, Post Interviews	Course Evaluation Questionnaire, Post Interviews	Course Evaluation Questionnaire, Post Interviews
1.3. What are the perceptions of the language instructors about the effectiveness of the mTPD course on DGELL?	Course Evaluation Questionnaire, Post Interviews	Course Evaluation Questionnaire, Post Interviews	Course Evaluation Questionnaire, Post Interviews

(continued)

Table 3. 6 (continued)

Summary of Research Questions and Data Collection Instruments

	Research Questions	Data Source		
		Prototype 1	Prototype 2	Final Product
2.	To what extent do the language instructors' perceptions about using digital games in teaching change after the implementation of mTPD course?	Using Digital Games in Teaching Questionnaire (Pre-post)	Using Digital Games in Teaching Questionnaire (Pre-post)	Using Digital Games in Teaching Questionnaire (Pre-post)
3.	To what extent does the mTPD course on DGELL contribute to language instructors' knowledge on DGELL?	Achievement Test (Pre-post), Lesson Plan (Rubric)	Achievement Test (Pre-post), Lesson Plan (Rubric)	Achievement Test (Pre-post), Lesson Plan (Rubric)

3.6.1 Course Evaluation Questionnaire

The course evaluation questionnaire (Appendix B) was developed by the researcher and the questions were prepared according to the previous research focusing on the design, development, and evaluation of a specific product. The questionnaire contains different parts. The first part includes 4 questions asking the participants to provide their feedback about their overall experience with the course. The second part is about the content of the mTPD course, and it includes items investigating participants' opinions about how useful different types of content (warm-ups, video lectures, etc.) are in general and how effectively these types were integrated into the course. The third part of the questionnaire includes items related to the design and usability of the mTPD course. The last 4 items in the questionnaire investigate the participants' opinions about the mTPD course's ability to meet the needs of the participants and its capacity to endure in a relatively ongoing way across further practices. The questionnaire was developed in collaboration with an expert and was sent to 2 other

experts for review. The questionnaire was used in all cycles (prototype 1, prototype 2 and final product) after the course was completed by the participants.

3.6.2 Using Digital Games in Teaching Questionnaire

Using Digital Games in Teaching Questionnaire used in this study was developed by De Grove et al. (2012). The questionnaire includes five-point Likert scales ranging from totally agree to totally disagree. In the questionnaire, digital games were defined as any digital games that can be used in a learning context. The questionnaire investigates teachers' perceptions on using digital games in teaching and has five measures, which are ease of use, usefulness, experience, behavioral intention, and learning opportunities. Reliability and construct validity of the scale were explained by the developers by testing the factor structure of different scales and by using measures accounting for convergent and discriminant validity (De Grove et al., 2012). In their study, confirmatory factor analysis in AMOS was used to test the factor structure of ease of use, usefulness, learning opportunities, experience, curriculum relatedness and behavioral intention and the results indicated a satisfactory factor structure. Convergent validity was checked with coefficient alpha and average percentage of variance extracted (AVE). The results had an AVE higher than .05 and a Cronbach from .69 to .93, which indicated an adequate convergent validity. The AVE of 2 constructs were compared with the squared correlation of the same constructs to examine discriminant validity and the results indicated adequate discriminant validity. To understand the difference between participants' perceptions before and after the implementation of the mTPD course, the questionnaire was given before and after the implementation in all cycles (prototype 1, prototype 2 and final product).

3.6.3 Achievement Test

To understand the impact of the mTPD course implementation on participants' knowledge on DGELL, a standardized achievement test was developed and used before and after the implementation of the prototypes and the final product. The test

items were developed according to the guidelines mentioned by Simonson, et.al., (1987):

1. Stating the purpose of the test,
2. Describing characteristics of a good test,
3. Making a list of competencies and definitions,
4. Preparing guidelines for multiple-choice questions,
5. Stating the format of the initial draft,
6. Preparing several samples of items.

It was important to measure participants' progress in the objectives as intended by the researcher, so all questions were created in accordance with the curricular validity of the outcome measure (Confrey, 2006). The researcher created different sets of questions and he collaborated with an expert to assess the validity of the questions. The questions which were misaligned with the mTPD course objectives were excluded and the achievement test was sent to another content expert for further review. The content expert didn't recommend any changes in that draft and the finalized version of the achievement test was used in all cycles without making any further modifications.

3.6.4 Lesson Plan Assessment with Rubric

It was decided to use lesson plan assessment with rubric with an expert because standardized achievement tests basically measure the knowledge that the participants are expected to learn but they are not effective as standalone outcome measures for the evaluation of skills that the intervention teaches (Sussman & Wilson, 2019). In this study, one of the goals of the mTPD course was to teach language instructors how to use digital games as language learning resources. To achieve this goal, participants were expected to develop a lesson plan using DGELL method. The researcher developed a Lesson Plan Assessment Rubric (Appendix E) in collaboration with an expert to assess the lesson plans based on some guidelines. According to Timmerman, et.al. (2011), rubric content validity can be improved by;

1. Reviewing the related literature and checking the rubrics developed in the previous research,

2. Analyzing the criteria that the domain experts use while evaluating the intended product,

3. Revision of the rubric by the designers,

4. Receiving feedback from multiple content experts.

After the rubric was developed, it was sent to two different experts for review. The first draft of the rubric was prepared with an analytic approach with several assessment criteria, but one expert recommended to use a holistic rubric since the purpose of the assessment was to assess learners' overall achievement on the lesson plan activity. The rubric was created with a holistic approach and basically evaluates how effectively PCaRD model is used to integrate digital games into language instructors' classroom teaching. Relying on data both from achievement test and the lesson plans, the researcher was able to assess the knowledge and skills emphasized by the instructional interventions.

3.6.5 Interviews

Interviews are very important data collection techniques involving verbal communication between the researcher and the participants. According to Cohen, et.al., (2007), there are different purposes of conducting interviews as a research technique, such as:

1. Collecting information related to the research objectives,
2. Testing / suggesting hypothesis or helping identify variables and relationships,
3. Validating other data or going deeper into the data gathered from respondents through different data collection tools (p. 351).

In this study, interviews were conducted to gain deeper understanding of the perceptions of the participants about the mTPD course. Standardized open-ended interview approach was used because of its systematic, structured, and efficient nature

which prevents bias when several interviews are conducted and when the interviewers are less experienced. It is also important to provide a basic structure while developing an interview protocol. Kvale (1996) identified seven stages in designing and implementing an interview study. These are thematizing, designing, interviewing, transcribing, analyzing, verifying, and reporting. The researcher prepared an interview protocol (Appendix F) and followed these stages in the whole interview process. The interview questions were reviewed by two experts. The experts recommended to add questions regarding participants' previous experiences with digital games in learning. They also recommended to exclude the questions regarding their use of mobile learning in the classroom since these questions were not relevant to the main theme of the interview. Another recommendation was to switch the Yes/No questions with open-ended questions. For example, one question was 'Did you like taking the course on a mobile platform'. After the expert opinions, it was revised as 'What do you think about delivering content through a mobile platform rather than face to face?'. The questions were revised by the researcher. Interviews were conducted in all cycles after the mTPD course was completed.

3.7 Researcher's Role

The researcher took on many responsibilities in the study, such as researcher, course designer and course facilitator. He has been trained and competent over a wide variety of professional areas as well as the non-professional areas that require skills to design the interface of the course and edit videos. His professional interests include foreign language teaching, design, development and evaluation of curriculum and mobile learning. He has been teaching English as a second language for more than 18 years in a state university in Turkey. Besides, he has taught Turkish as a second language in 3 different universities in the USA for the last 10 years. His experience in teaching different languages to second language learners increased his understanding of the challenges both language instructors and language learners experience. He is also an experienced language instructor in remote learning. In 2020, he received an 'Excellence in Instruction' award from Indiana University Hamilton Lugar School of Global and International Studies. In his award letter, it was noted that "he was adept at identifying useful technologies and integrating them seamlessly in his classroom.

He consistently employed technology in ways that enhanced student engagement and learning and avoided deploying technologies where use would distract from the goals of the lesson".

In addition to his teaching experience, he also has a master's degree in Curriculum & Instruction, and he completed all his PhD coursework in the same discipline. His coursework included a variety of experiences including designing, developing, and evaluating educational programs in foreign language education. His interest to mobile learning began while he was working on his master's thesis. In his thesis, he investigated whether mobile phones as a language learning tool were effective on language learners' vocabulary. This study allowed the researcher to understand the potential of mobile learning in educational contexts where alternative methods are needed to access learning content.

It is also important to discuss the non-professional skills of the researcher since the development of the mTPD course required skills of video editing, organization of course interface and digital game playing experience. In addition to his professional skills, the researcher is competent in employing technological tools to edit videos and organize course interface. In his Fulbright FLTA grant period, he took Advanced Digital Photography class at University of Utah, which helped him develop his skills in using video and photography editing tools such as Adobe Photoshop, Adobe Premier, Camtasia Studio and iMovie. Using this experience, he was able to edit the videos that were used in the course and organize a user-friendly interface in the mobile application. Additionally, the researcher is experienced in playing digital games. He is familiar with different game genres and has played various digital games in different genres such as sports games and first-person shooter games since his adolescence. The fact that he is familiar with different games is considered to have contributed to the design and development of the mTPD course.

The researcher used both quantitative and qualitative data collection tools in the study. Since he was the primary tool for data collection, his role in the research was critical as he collected, coded and analyzed the data from all data collection tools (Creswell, 2014). The fact that he wore all the hats in the whole process, and he was a language

instructor at a university helped him in his data collection, analysis and understanding of the phenomena being studied since he truly experienced all steps in the process before writing them in detail. To eliminate any bias from his study, he paid extra attention to the validity and reliability tools which were necessary to report and analyze the data. These tools will be explained in detail in 'Validity and Reliability' section.

3.8 Ethics

Researchers need to be able to identify the ethical issues that they might confront while conducting their studies. In all phases of this research study, the researcher followed Cohen et al. (2007)'s principles that they suggested for educational research studies. First the research was conducted meticulously by applying appropriate procedures at all stages. The researcher reported all the procedures of the study accurately and candidly. He also made all the data available for rechecking. He provided objectivity of the research and prevented partial involvement of the research by any parties who are related. The researcher also told the research participants about the key elements of the study and what their participation would involve. A written consent form was provided to the participants containing the required information about all aspects of the intervention. He guaranteed that the participants would make use of the research and they wouldn't complete the research worse than they started.

The researcher respected participants' rights and provided them all the information about their rights to privacy. He made it clear that participants were free to withdraw from the study at any time they like. The researcher also informed the participants about the anonymity of the data collected. Participants were told how data would be collected, stored anonymously and then deleted after the research. They were informed about who would access, modify, and derive benefit from the data. The researcher also ensured member checking and negotiated ownership of data. The data collected from the participants were returned to the participants to check for accuracy (Cohen et al., 2007).

3.9 Validity and Reliability

Discussing validity and reliability concerns in research studies implementing both quantitative and qualitative data collection tools always needs thorough and careful explanations. To assess the validity and reliability of each measure used in the study, researchers need to consider a number of areas mentioned below.

3.9.1 Internal Validity

Internal validity can be defined as the explanation of a set of data collected from a research study can actually be provided by the data itself (Cohen et al., 2007). Guba and Lincoln (1981) argued that internal validity is used in quantitative studies which is concerned with the truth of an observation, and they proposed an alternative term, credibility, stating that the results of qualitative research are credible from the perspective of the research participants. This study adopted the credibility techniques suggested by Guba and Lincoln (1981), which are prolonged engagement in the field, triangulation, peer debriefing and member checking.

Prolonged engagement. Researcher worked with a total of 44 participants, and he spent a great deal of time interacting with the participants to avoid the disadvantage of connectedness in mobile learning context. He sent continuous emails to the participants asking if they needed any support and shared his mobile phone number with them in case they needed to reach out to him immediately. From the first moment of his communication with the instructors, he built trust with the instructors to overcome distortions, and this helped him get more credible data in the interviews since the participants saw the researcher as a colleague rather than an inquirer.

Triangulation. The researcher verified the findings through referring to multiple types of triangulations, such as source triangulation, investigator triangulation and data triangulation. In this study, the researcher used source triangulation by including several participants in different implementations (prototype 1-2 and the final product) to understand the effectiveness of the course (Denzin, 2017). Investigator triangulation

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was also used by involving multiple researchers for analyzing the data and the consistency of the results were provided across multiple people. After interview transcripts were coded by the researcher, 20% of the dataset (6 interview transcripts) were sent to an independent researcher with a codebook, and they studied 6 interview transcripts with the same codes to check for reliability (Lilgendahl & Mcadams, 2011). The codes were compared to see the degree of consistency and 90% of agreement was found between two coders, which is considered to be an acceptable level of consistency (Syed & Nelson, 2015). Lesson plans were also sent to another content expert in DGELL, and they were invited to assess the lesson plans using the rubric. The agreement between two coders was %95. In addition to those, the analysis of the quantitative data was checked with 2 other statistics experts for validation. The last type of triangulation used in this study was data triangulation. It was used by employing both qualitative and quantitative methods of data collection to explain the phenomenon fully and in rich detail.

Peer debriefing. The researcher worked together with other researchers who hold impartial views of the study throughout the whole research process. The impartial researchers examined the researcher's general methodology, analysis, and the reporting of all findings. This helped the researcher become more aware of his own views towards the whole design and analysis process. For instance, the researcher held a Zoom meeting with a professor teaching at Iowa State University who had a recognized experience in mobile learning, and they discussed the mobile learning aspect of the research. The professor helped the researcher choose an appropriate mobile learning framework (iPAC Framework) and shaped the researcher's choice of pedagogy in developing the instructional materials. Additionally, another expert in educational technologies guided the researcher to employ design and development research and offered competent advice to develop the methodology of the research. The researcher also decided to involve lesson plan assessment scores as a data collection instrument after another expert shared her feedback about the data collection methods used in the study. Lastly, the researcher received continuous feedback and support from his dissertation supervisor on an ad hoc basis. All the chapter drafts, data reporting and other work along the way were strictly reviewed by the supervisor formatively and detailed feedback was provided about the work without any delay.

Member checking. The researcher asked three participants to review and respond to data. Firstly, they were given their own copies of transcripts to correct mistakes and provide additional information to improve data accuracy. Then interpreted drafts were given to the respondent to see their reactions. Participants agreed on the potential representation of the data. Both steps were conducted to increase the descriptive and interpretive validity of the results.

3.9.2 External Validity

External validity is the extent to which the results of a study can be generalized to other settings or people (Cohen et al., 2007). The current study doesn't intend to generalize its findings to a wider population. However, the researcher provides an in-depth, detailed, and clear description of the whole research process so that other researchers who conduct similar design and development studies can decide which part of the project they can benefit from. As Lincoln and Guba (1986) proposed, the current study includes rich and thick description of all the phases of the study for the researchers of prospective design/development projects and it is at other researchers' discretion to decide which piece of this study is transferable or whether transferability is possible.

3.9.3 Validity and Reliability of the Data Collection Tools

To provide the face validity, the researcher prepared an interview protocol according to the stages developed by (Kvale, 1996) and the interview protocol was sent to two researchers for their expert opinion. Patton (2002)'s standardized open-ended interview approach was employed because of its systematic, structured, and efficient nature, so each respondent was able to understand the questions in the same way. The interviews were also recorded with the respondents' consent. One master coder and a reliability coder were used while coding the responses so that inter-rater reliability was enhanced. Leading questions were avoided during the interviews. The researcher knew the subject matter well. He conducted the interviews in an organized structure and

allowed the interviewees to take their time and answer without any interference (Leech, 2002).

To increase the response rate of the questionnaires, the researcher conducted multiple ways of follow-ups to request the completion of all questionnaires before and after the implementations. He did so by stressing on the importance of the data gathered and their contribution to the importance of the study with their feedbacks. The researcher also provided the necessary information to the participants, such as length of the questionnaire, time expected to be spent and their rights to withdraw (Fan & Yan, 2010).

Achievement test was developed according to the guidelines proposed by Simonson, et.al., (1987). At the initial stage, the purpose of the test was determined and then the content to be asked in the test was identified. Questions were prepared in accordance with the curricular validity of the outcome measure. The researcher created different sets of questions and the achievement test was sent to three researchers for expert opinion. The questions which were misaligned with the mTPD course objectives were excluded and the achievement test was sent to another content expert for further review. Inter-rater reliability of the tool was provided by using two markers in the assessment phase. There was 100% agreement between the assessment scores of both markers.

The researcher conducted a comprehensive literature review and determined some criteria to assess participants' lesson plans. Then, he developed the first draft of the lesson plan assessment rubric and revised it with his supervisor. Afterwards, the rubric was sent to two different experts for expert opinion. Inter-rater reliability of the tool was provided by using two markers in the assessment phase. All 34 lesson plans in all cycles were graded by two markers and the agreement rate between two markers was 95%.

3.10 Data Analysis

The researcher collected data through quantitative and qualitative techniques using different data collection instruments.

3.10.1 Quantitative Analysis

Researcher used multiple qualitative analysis methods in different phases of the quantitative analysis phase of the study, including descriptive statistics, a Wilcoxon-signed rank test, a paired samples t-test and a dependent samples T-test.

In research question 1, the perceptions of the participants regarding the mTPD course were investigated through questionnaire data and these data were analyzed descriptively by calculating the frequencies, percentages, mean and standard deviation scores.

In research question 2, a Wilcoxon-signed rank test was conducted to determine whether there was a significant change in the perceptions of the participants before and after the mTPD course in Prototype 1. Wilcoxon-signed rank test is a non-parametric test designed to evaluate the difference between two related samples when the prerequisites for a dependent samples t-test are not met (Cohen et al., 2007). Due to the very small sample size of the data set, Wilcoxon signed-ranked test was preferred to paired t-test in prototype 1. However, in prototype 2 and final product implementation, Shapiro-wilk test was performed to check for normal distribution and did not show any evidence of non-normality. Based on this outcome, a paired samples t-test was conducted to determine whether there was a significant change in the perceptions of the participants before and after the mTPD course in prototype 2 and final product. Since there were multiple dependent variables in the test (usefulness, ease of use, experience, learning opportunities, curriculum relatedness and behavioral intention), Bonferroni correction was conducted to avoid inflated Type 1 error. The adjusted p value for the analysis is $p < .008$.

In research question 3, a Wilcoxon-signed ranks test was conducted to evaluate whether participants' achievement test scores changed significantly after the mTPD course in Prototype 1. Shapiro-wilk test showed a normal distribution in prototype 2 and final product, so a dependent samples T-test was conducted to evaluate whether participants' achievement test scores changed significantly after the mTPD course in prototype 2 and final product.

In addition to the achievement test scores, participants' knowledge about the mTPD course was investigated by assessing their lesson plans. A holistic rubric was used to assess the lesson plans and participants' achievement in the lesson plan task was assessed by giving an overall score out of 4. Descriptive analysis was used to interpret the data and provide information about participants' achievement in the lesson plan task.

To compare all three cycles (prototype 1, prototype 2 and final product) and to determine if there were statistically significant differences between the groups, a Kruskal-Wallis test and Dunn's test were performed. Kruskal-Wallis test is a rank-based nonparametric test that is used to determine if there is or is not a statistically significant difference between 3 or more independent groups (Cohen et al., 2007). However, Kruskal-Wallis test doesn't tell where the difference lies between these groups. Once this test found a significant difference in 3 different cycles, Dunn's test was used to pinpoint exactly which groups were significantly different.

3.10.2 Qualitative Analysis

Qualitative data analysis involved the analysis of the interviews that were conducted to have a deeper understanding of participants' perceptions about the mTPD course.

Each participant was assigned a pseudonym and their real identity wasn't indicated in the study. The format used for identities included 'P' for participant and their order of their involvement into the study (eg. P1, P2, P3, etc.). Participants in prototype 1

ranged from P1 to P8. Participants in prototype 2 ranged from P9 to P19. Participants in final product ranged from P20 to P44.

After each implementation, data sources were reviewed and transcribed by the researcher. For the interview analysis, thematic analysis was conducted to identify and report themes within data that provided in-depth explanation to the research question. Braun and Clarke (2006) defined thematic analysis as the process of identifying patterns or themes in a qualitative data by providing rich and detailed account of data. This study employed thematic analysis to interpret the qualitative data because it is a useful method for investigating the perspectives of different research participants, summarizing the key features of a large data set and producing a well-organized final report (Nowell et al., 2017). Thematic analysis of the data was conducted using the six-phase guide provided by Braun and Clarke (2006):

Step 1: Become familiar with the data

Step 2: Generate initial codes

Step 3: Search for themes

Step 4: Review themes

Step 5: Define themes

Step 6: Write-up

In the first step, transcripts in prototype 1 were re-read several times to be familiar with the entire body of data. Then, initial codes were generated by addressing the specific research question. The research question sought for information related the content, usability, and effectiveness of the mTPD course so only the data that was relevant to the research question were coded. After generating the initial codes, these codes were discussed and developed with the supervisor. Then the researcher generated a codebook and sent the transcripts to an independent researcher for inter-rater reliability. In the latter phase of coding, the codes were compared, discussed, and modified before moving on to the transcripts in prototype 2 and final product. Working

through the transcripts in prototype 2 and final product, new codes were generated, and the existing ones were modified.

After the coding phase, the codes were examined, and collocated into separate themes. Then, themes were reviewed to see if they were able to describe patterns in the data relevant to the research question. There were some questions that were considered in this phase (Maguire & Delahunt, 2017):

- Do the themes make sense?

- Are the themes relevant to the research questions?

- Do the codes and quotes support the themes?

- Do the themes overlap?

- Are there other themes related to the research question in the data?

After reviewing the themes in consideration with these questions, final version of the themes was determined. The last step of thematic analysis was to report the findings.

3.11 Limitations of the Study

There were some limitations to this study. First limitation was related to the researcher himself. He played multiple roles in the study, designing, and developing the mTPD course, taking an active role in the implementation phases as the course facilitator and conducting the whole research process. Therefore, member checking, triangulation, and inter-rater reliability assessment were utilized to diminish researcher effect.

The mobile platform, Schoology, was also a limitation of this study. Despite its advantages to other mobile platforms, there is lack of customization across some aspects of the application, such as lack of option to make all units visible but make them available in different times, lack of third-part application integrations, keeping track of one's own progress and too much clicking to reach a content.

Sampling is another limitation of this study. By designing, developing, and evaluating an mTPD course on DGELL, the researcher aimed to obtain insights about the mTPD course, and he used convenience and criterion sampling strategies to choose available language instructors and teachers willing to participate the study. The sample was limited to 42 language instructors teaching at English language teaching schools of universities and 2 language teachers teaching at MoNE schools. These 2 language teachers took part in the second prototype. The prototype implementations of the mTPD course were conducted during the school semester and the participants were busy with teaching and other responsibilities. This situation might have limited the commitment of participants to the expectations of the course.

The data related to the participants' in-class experiences could not be obtained at the final phase of the study because of the time constraint. The program evaluation data gathered through study relied on the perceptions of participants, achievement test scores and lesson plan assessment scores of participants.

CHAPTER 4

RESULTS

The preceding chapter has shown the process of design and development research by discussing the design, development, and implementation phases of the mTPD course. This chapter addresses the evaluation of each implementation of the mTPD course (prototype 1, prototype 2, and final product). Each implementation starts with a description of participants with demographics and their experience with technology and digital games. The findings of each implementation are given according to the research questions.

4.1 Prototype 1

4.1.1 Description of the Participants in Prototype 1

Participants were eight language instructors who were working at foreign language schools of three Turkish universities. The gender composition of the participants was 75% female (n=6) and 25% male (n=2). Regarding the experience of language instructors, 75% of the participants (n=6) had 16 years and more teaching experience while 12.5% of the instructors (n=1) had 11-15 years of experience and 12.5% of them (n=1) had 4-10 years of teaching experience. 87% of the participants had graduate degrees (n=7), while 13% of the instructors (n=1) had an undergraduate degree.

Participants were asked to select their ability to use technological devices. The options included basic, moderate, advanced, and expert. As can be seen in Figure 4.1, 50% of the participants indicated they were expert (n=2) and advanced (n=2) in using technological devices, while the remaining participants indicated they were moderate (n=3) and basic (n=1) users.
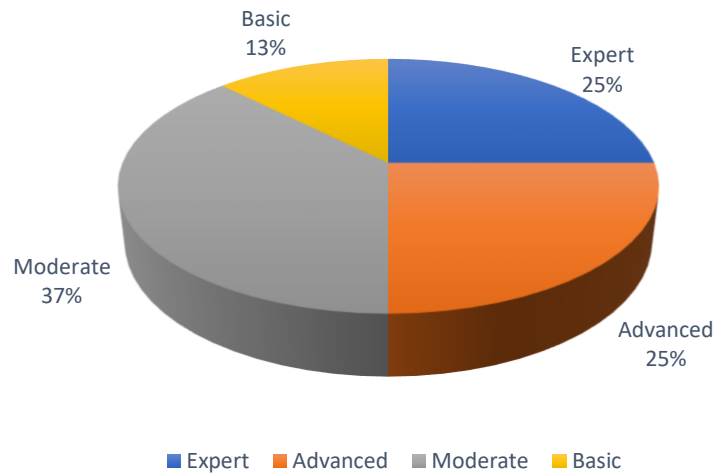
Figure 4. 1. Participants' Level of Ability to Use Technological Devices in Prototype 1.

Participants were also asked how often they were using technology in teaching activities (Figure 4.2). 27.5% of the instructors (n=2) indicated they always integrated technology in their classrooms and 37.5% of the instructors (n=3) said that they often used technology in their teaching activities. 37.5% of the instructors (n=3) indicated that they sometimes used technology in their teaching. Within this context, the participants were also asked how often they were using digital games for teaching in class. 62% of the instructors (n=5) indicated that they were using digital games 1-2 times a week in their classes, while 38% of the instructors (n=3) indicated they never used digital games in their teaching.
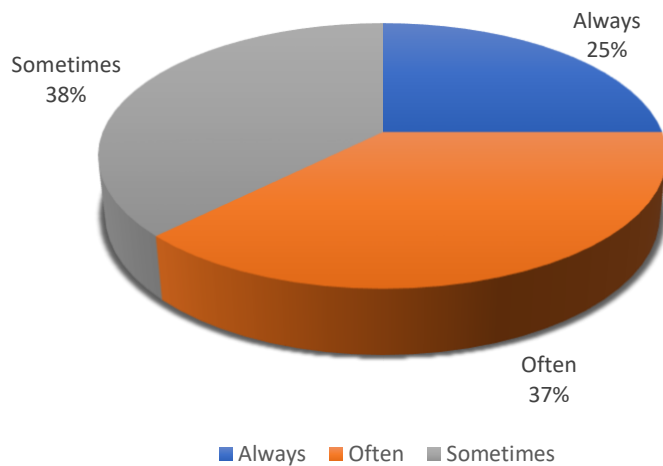
Figure 4. 2. Distribution of Participants Using Technology in Their Teaching in Prototype 1.

Lastly, participants were asked if they had ever participated in any kind of professional development activities about using digital games in language learning. 25% of the instructors (n=2) indicated that they participated a professional development activity about using a digital game in language learning before, while 75% of the participants (n=6) indicated they had never participated in any kind of a professional development activity about digital games in language learning.

4.1.2 Research Question 1

To understand if the program inputs were operating well together, identify the problems to be solved and develop the program, the quantitative data to the first research question was collected with course evaluation questionnaire and qualitative data with interviews. The first research question aimed to explore the perceptions of the language instructors towards the mTPD course on DGELL in three different aspects: content, usability, and effectiveness of the mTPD course. The following sections will explain the results of these aspects.

4.1.2.1 Perceptions About the Content of the mTPD Course

4.1.2.1.1 Quantitative Findings

First, participants were asked how much of the content they completed in the mTPD course. 37.5% of the participants (n=3) stated that they completed all the content in the mTPD course, while 62.5% of the participants (n=5) stated that they skipped some content. It was found out that only 50% of the participants (n=4) participated in the discussion forum activities. Lecture tasks in each module and achievement tests were completed by 75% of the participants (n=6) while written lectures, try-out tasks and warm-up tasks were completed by 87.5% of the participants (n=7). Video lecture is the only content that was completed by all the participants. (Figure 4.3).
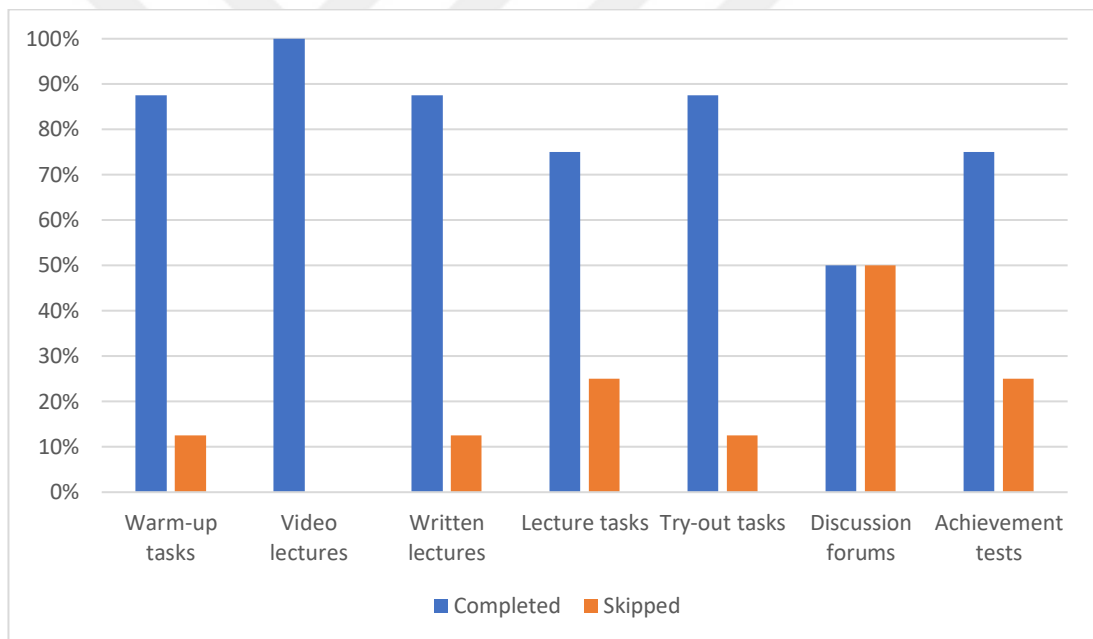
Figure 4. 3. Distribution of Course Content Completed by the Participants in Prototype 1.

Participants (n=8) were asked to decide how important each content of the mTPD course was by using 5-point scale from 'very important' to 'not at all important'. Results of this question can be seen in Table 4.1. All the participants (n=8) agreed on the importance of video lectures of the experts teaching new information. Warm-up tasks were indicated as important by 87.5% of the participants (n=7). Written lectures,

lecture tasks, try-out tasks and achievement tests were also found to be important by 87.5% of the participants (n=7); however, there was only one participant (n=1) who was indecisive about the importance about these contents in the mTPD course. 37.5% of the participants (n=3) pointed out that they were not sure about the importance of discussion forums at the end of each unit while 62.5% of the participants (n=5) found them important.

Table 4. 1

Results of the Course Evaluation Questionnaire About the Importance of Content in Prototype 1

	Very important		Important		Not sure		Slightly important		Not important	
	n	%	n	%	n	%	n	%	n	%
Warm-up tasks	2	25	5	62.5	-	-	-	-	1	12.5
Video lectures	5	62.5	3	37.5	-	-	-	-	-	-
Written lectures	4	50	3	37.5	1	12.5	-	-	-	-
Lecture tasks	2	25	5	62.5	1	12.5	-	-	-	-
Try-out task	4	50	3	37.5	1	12.5	-	-	-	-
Discussion forums	2	25	3	37.5	3	37.5	-	-	-	-
Achievement tests	2	25	5	62.5	1	12.5	-	-	-	-

Participants also expressed their opinions about the quality of the content of the mTPD course on a five-point scale, 'strongly agree to strongly disagree'. Results of this part of the questionnaire can be seen in Table 4.2. All participants stated that the content was clear, and topics of the content followed a logical order. 87.5% of the participants (n=7) stated that the content of the course helped them learn how to use digital games in their teaching using Digital Game-Enhanced Language. 75% of the participants (n=6) thought that the content of the warm-up tasks was in congruent with the content taught; however, there was one participant who was indecisive and one participant

who didn't agree with this statement. All participants were satisfied with the content of the video lectures, and they agreed with the statement that video lectures helped them learn the subjects. Unlike the agreement on the video lectures, 25% of the participants (n=2) were indecisive about the effect of written lectures on their learning. 75% of the participants (n=6) stated that rubrics in each activity were sufficient, but 25% of the participants (n=2) approached this statement cautiously. 75% of the participants (n=6) stated that try-out tasks reinforced their learning and 25% of the participants (n=2) indicated that they were not sure whether try-out tasks reinforced their learning or not. One of the most significant findings of the course evaluation questionnaire was the participants' opinions about the discussion forums. According to the teachers' perceptions, it is the only content area that doesn't have a strong positive influence on the participants. While 50% of the instructors (n=4) stated that discussion forums helped them learn other people's opinions about the subject matter, 37.5% of the participants (n=3) approached this statement cautiously by choosing the 'not sure' option and one participant indicated that s/he doesn't agree with this statement. Lastly, 75% of the participants (n=6) stated that achievement tests were good enough to assess their learning while 25% of the participants (n=2) stated that they were not sure about this statement.

Table 4. 2

Results of the Course Evaluation Questionnaire About the Quality of Content in Prototype 1

	Completely agree		Agree		Not sure		Disagree		Completely disagree	
	n	%	n	%	n	%	n	%	n	%
Content was clear.	5	62.5	3	37.5	-	-	-	-	-	-
Content followed a logical order.	6	75	2	25	-	-	-	-	-	-
Content of the course helped me learn DGELL.	4	50	3	37.5	1	12.5	-	-	-	-
Content of warm-up tasks were in congruent with the content taught.	4	50	2	25	1	12.5	-	-	1	12.5
Video lectures helped me learn the subjects.	4	50	4	50	-	-	-	-	-	-
Written lectures helped me learn the subjects.	4	50	2	25	2	25	-	-	-	-
Rubrics were sufficient.	4	50	2	25	2	25	-	-	-	-
Try-out tasks reinforced my learning.	4	40	2	25	2	25	-	-	-	-
Discussion forums helped me learn other people's opinions about the subject.	1	12.5	3	37.5	3	37.5	1	12.5	-	-
Achievement tests were good enough to assess my learning.	4	50	2	25	2	25	-	-	-	-

4.1.2.1.2 Qualitative Findings

Interviews were conducted with five participants to gain a deeper understanding of the findings obtained through the course evaluation questionnaire. Thematic analysis was used to analyze the transcripts of the interviews. Two main themes were found from the analysis of the data related to the content of the mTPD course: satisfaction and suggestions. The main themes and subthemes are presented in Table 4.3. Each theme will be explained further using quotations from transcripts to provide a better understanding.

Table 4. 3

Themes and Subthemes About Content in Prototype 1

Themes	Subthemes
Satisfaction	• Course content fulfilled my expectations
	• Satisfaction with the depth of content
	• Satisfaction with multiple content types and formats
	• Satisfaction with clear and effective instructions
	• Satisfaction with warm-up tasks
	• Satisfaction with the videos
	• Satisfaction with extra materials
Suggestions	• Need for support in creating a new lesson plan
	• A different type of game may be added

4.1.2.1.2.1 Theme 1: Satisfaction about the content in prototype 1

This theme represents the findings about how satisfied language teachers were regarding the content of the mTPD course. There are seven subthemes: course content fulfilled my expectations, satisfaction with the depth of content, satisfaction with multiple content types and formats, satisfaction with clear and effective instructions, satisfaction with warm-up tasks, satisfaction with the videos and satisfaction with extra materials. These subthemes are explained further below using examples from the interviews.

All five interviewees stated that they liked the course and their expectations about the course were mostly met. One interviewee stated that he was expecting to learn new

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things that might bring an innovative approach to foreign language teaching and after the training, he thought that this mTPD course could help this purpose.

We need this kind of a training because this is a neglected area. I mean, I definitely think that this kind of thing could be very useful in language teaching, but first people need to know this. (P5)

Böyle bir eğitime ihtiyacımız var çünkü this is a neglected area. Yani kesinlikle bu tarz bir şeyin dil öğretiminde çok işe yarayabileceğini düşünüyorum onun için ama önce insanların bunu bilmesi lazım. (P5)

Another interviewee noted that the components of the course content helped her demonstrate understanding of the subject.

Even if I was a person who doesn't do things like I do now personally or professionally, I would definitely benefit from this course. As I said before, it served the purpose very well, and there was nothing in the course that could distract me from its focus. (P4)

Hiç yolunu profesyonel olarak ya da kişisel olarak benim yaptığım gibi şeyleri yapmayan bir insan olsaydım bile bu kurstan kesinlikle verim alırdım. Dediğim gibi çünkü amaca çok iyi hizmet ediyor. Yani beni odağından çıkarabilecek rahatsız edebilecek hiçbir içerik yoktu. (P4)

Participants also expressed their opinions about how focused and comprehensive the content of the course was. They stated that they were satisfied with the fact that only the information they needed was given in an adequate and understandable way without any confusion. 'To the point' and 'compact' were the two words that the interviewees used most to express their opinions about the content.

I think it's compact and to the point. I do not know if it is missing something because I don't have experience in this field, but I can say that it was not beyond what I needed. I didn't see anything that would irritate and make people say, let's skip this and come to the main topic. (P1)

Compact ve to the point olmuş bence şey yok eksiği var mı bilmiyorum çünkü bu konuda tecrübem yok ama ihtiyacımdan fazlası yok diyebilirim. İnsanı sinir eden yoran ay bunu geçelim esas konuya gelelim dedirtecek bir şey göremedim. (P1)

One participant highlighted the importance of providing multiple content types in the course, which could help them learn the subject in various ways.

It was also good that you had different media. There was not only video, but also different input. I especially liked that the input was varied. Reading a short article in one, watching a video in other, doing something else in another, these are good things. (P5)

Farklı medya bulundurmanız da iyiydi. Yani sadece video yoktu farklı input da vardı, inputun farklılaşmış olması özellikle çok hoşuma gitti. Birinde küçük bir makale okumak, birinde video izlemek, birinde başka bir şey yapmak, bunlar güzel şeyler. (P5)

Another component of the mTPD course that the participants liked about the content was the instructions given inside the modules.

The instructions were given very explicitly, that is, the instructions were very clear about the purpose of any activity and how to evaluate it. (P2)

Instruction'lar çok açık çok net verilmişti, yani yönergeler herhangi bir aktivitenin amacı ve nasıl değerlendirme olacağıyla ilgili gayet netti. (P2)

Interviewees also expressed their satisfaction about some specific components of the mTPD course, such as warm-up activities, videos and extra materials. One participant stated that she liked the fact that warm-up activities in each module were brief and clear, and they enabled her to make links between what she already knew and what she would learn in the upcoming module.

Warm up activities were very good; wait a minute let me remember, the activities were directly related to the module topics. There are mostly hands-on activities, I found them quite good. We were given the explanations and instruction and we

warmed up doing it with an activity. I liked them very much. It is short and concise, it does not tire me much, but it also introduces me to the subject. (P3)

Warm up aktiviteleri çok iyiydi bir dakika hemen hatırlayacağım, aktiviteler modül konularıyla direkt ilişkili idi. Etkinlik oluyor genelde, ben onları gayet iyi bulmuştum. Tanımları ya da kriterler verilmişti ve onu etkinlikle yaptırarak bir ısınma yapıyoruz onları çok beğenmiştim ben yani kısa ve öz beni çok yormuyor ama konuya da girişimiz sağlıyor. (P3)

Another participant reported that the short duration of videos allowed her to process information better since she had a short attention span.

I mostly studied the course when I was available. If the video was about half an hour, something would interrupt me continuously. For example, we have a teacher, X at the end, and you have put her video both as a whole and by dividing it in short parts. I watched her videos and it really worked for me, it was easy to both download and watch. I watched one part or two parts, then I was interrupted, I needed to do something else, then I came back, for example, and I said I'd continue from there. (P4)

Ben daha çok mümkün olan zamanlarda çalıştım derse. Yani yarım saatlik bir video olursa bir şeyler beni devamlı bölecek. Mesela hocamız var en sondaki X onu da hem bütün olarak hem de kısa kısa bölerek koymuşsunuz. Ben onun bölümlerini izledim ve benim çok işime geldi, hem inmesi izlemesi kolay oldu. Bir bölüm iki bölüm izledim bölündüm, başka bir işime bakmam gerekiyordu. Geri geldim ve ben oradan devam ederim dedim mesela. (P4)

Four interviewees shared the same positive perception about the extra materials given at the end of each unit. One participant stated that she made use of the extra materials while she was preparing her lesson plan.

There were extra materials in the course, I benefited from them, and I learned a lot. I don't know if I could reflect them on the lesson plan, but they made me realize a lot of things. (P2)

Ekstra materyaller vardı derste, ben onlardan faydalandım, yani ben onlardan çok şey öğrendim hemen yansıtabildim mi ders planına bilmiyorum ama çok şeye uyanmama sebep oldu. (P2)

4.1.2.1.2.2 Theme 2: Suggestions about the content in prototype 1

This theme highlights language teachers' suggestions about the content of the mTPD course. There are two subthemes: need for support in creating a new lesson plan and different type of game may be added. These subthemes are explained below using quotations from the interviews.

The most obvious challenge that the participants had during the training was the need for support in creating a new lesson plan. One participant reported that there was only one sample lesson plan which focused on vocabulary, and he needed to see more lesson plan examples as a guide since he had no prior experience in preparing a digital game lesson including different language skills other than the one that was given in the task.

> *It was not easy for me to adapt it because I have never used the games practically in my own classes and I have a sample lesson plan focused on only one skill. It focused on a very different skill, and I was not very clear about how the skill I wanted to focus on should be taught with the games. There was no textbook example in front of me or a concrete example of best practice. That's why it was a little difficult for me to adapt the sample lesson plan I have. (P1)*

> *Oyunları uygulamalı olarak kendi sınıflarımda hiç kullanmadığım için ve elimde sadece tek bir beceriye odaklı olarak hazırlanmış bir ders planı olduğu için onu adapte etmem çok kolay olmadı. O çok farklı bir beceriye odaklanıyordu ve benim odaklanmak istediğim becerinin oyunlarla nasıl öğretilmesi gerektiği konusunda çok net değildim çünkü önümde birebir örtüşen bir örnek yoktu ya da en iyi uygulamaya dair somut bir örnek yoktu. O yüzden elimdeki örnek ders planını uyarlamak beni biraz zorladı. (P1)*

Another participant stated that she needed to receive some feedback about her lesson plan to understand if any adjustment was needed in her work.

> *It was a bit intense for me, how I coped, by listening again, taking notes while planning the lesson. Sometimes it didn't make sense to me, I couldn't understand it, it would be nice if there was feedback from a teacher there. Because it would be great if the teacher gave feedback; you do something like this, but look, it could be something like this, the reflection mentioned here is something like this. (P3)*

Bana biraz yoğun geldi, nasıl başa çıktım, tekrar dinleyerek, ders planı yaparken not alarak. Bazen benim mantığıma gitmedi ama oturtamadım anlamadım, işte orada bir hocadan feedback gelse iyi olurdu. Hoca dönüt verse süper olur; mesela şunu şöyle yapıyorsun, ama bak şöyle bir şey olabilir, burada bahsedilen reflection şöyle bir şey gibi. (P3)

Two participants also highlighted the importance of including different types of games to the mTPD course. One participant stated that she couldn't engage with the game recommended in the course and she had to find her own solution to proceed in the course.

I tried to play this game to be able to do it, but I couldn't because I was bored. So, you turn somewhere, then you turn another direction, it was not a game for me at all. So, I went back and watched the walk-through video of the guy on YouTube. I watched him for 10-15 minutes, then I stopped because it takes an hour for the man to tell about it while playing there. Well, I don't have that much time, so I didn't want to do that either. So I wish I had alternatives. (P5)

Bu oyunu ben oynamaya çalıştım yapabilmek için ama yapamadım çünkü çok sıkıldım. Yani oraya dönüyorsun bir şey, buraya dönüyorsun bir şey, hiç bana bir göre bir oyun değilmiş. Bunun üzerine döndüm YouTube'dan bunu oynayan adamın videosunu izledim. Onu da bir 10-15 dakika izledim sonra atladım çünkü 1 saat sürüyor adamın orada oynarken bunu anlatması. E benim o kadar vaktim yok yani onu da yapmak istemedim. Dolayısıyla alternatiflerimin olmasını isterdim. (P5)

4.1.2.2 Perceptions About the Usability of the mTPD Course

4.1.2.2.1 Quantitative Findings

To start with, participants were asked how much time in average they spent for each unit in the mTPD course. 62% of the participants stated that they spent between 30 minutes and 1 hour in each unit (n=5). There was only one participant who spent less than 30 minutes for each unit (Figure 4.4).
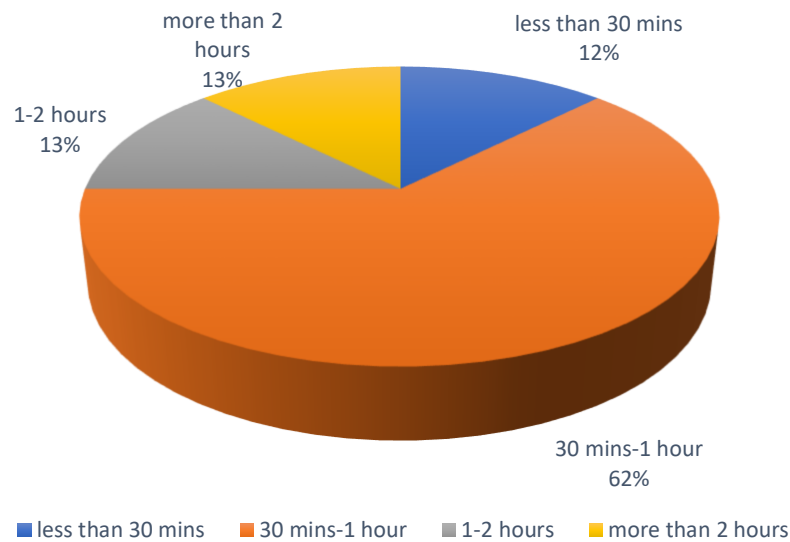
Figure 4. 4. Time Spent on Each Unit in the mTPD course in Prototype 1.

Lastly, participants were asked in which locations they reached the mTPD course more often; their home, workplace or mobile. All instructors stated that they were mostly at home while they were studying the course and two instructors added that in addition to studying home, they also studied the course at their office or when they were mobile.

Participants (n=8) were asked six questions to assess how well they were able to use different functions of the mTPD course. As can be seen in Table 4.4, 50% of the participants (n=4) expressed positive opinions about the easiness of the course interface, while 37.5% of the participants (n=3) were hesitant and one participant thought the course interface wasn't easy to use. 87.5% of the participants (n=7) stated that they were able to open and watch the videos, do and share their assignments on Schoology app without any problem. All participants stated that they were able to log in the course easily and all links were working well in the modules. As was the case in the previous question, 62.5% of the participants (n=5) expressed negative opinions when they were asked if they were able to communicate with their peers in the discussion forums easily.

Table 4. 4

Results of the Course Evaluation Questionnaire About Usability in Prototype 1

	Completely agree		Agree		Not sure		Disagree		Completely disagree	
	n	%	n	%	n	%	n	%	n	%
Course interface was easy to use.	2	25	2	25	3	37.5	1	12.5	-	-
I was able to open and watch the videos easily.	6	75	1	12.5	1	12.5	-	-	-	-
I was able to log in the Schoology course easily.	6	75	2	25	-	-	-	-	-	-
All links were working well.	5	62.5	3	37.5	-	-	-	-	-	-
I was able to do and share my assignments on Schoology app without any problem.	5	62.5	2	25	1	12.5	-	-	-	-
I was able to communicate with other learners in discussion forums easily.	2	25	1	12.5	4	50	1	12.5	-	-

4.1.2.2.2 Qualitative Findings

Two main themes emerged from the analysis of the data related to the usability of the mTPD course: challenges and suggestions. The main themes and subthemes are presented in Table 4.5. Each theme will be explained further using quotations from transcripts to illuminate participants experience about the usability of the mTPD course.

Table 4. 5

Themes and Subthemes About Usability in Prototype 1

Themes	Subthemes
Challenges	• Screen size could be limiting
	• Concentration is difficult due to mobility
	• Difficulty to correct typos on mobile devices
	• Sharing homework on mobile devices was not easy
Suggestions	• Course navigation could be improved
	• Sentences in some questions could be shortened

4.1.2.2.2.1 Theme 1: Challenges about usability in prototype 1

This theme identified the challenges of the mTPD course perceived by the participants in terms of usability. There are four subthemes in this theme: screen size could be limiting, concentration is difficult due to mobility, difficulty to correct typos on mobile devices and sharing homework on mobile devices was not easy. Each subtheme is explained below using quotations.

Four interviewees stated that the small screen size of smartphones challenged them to read and process the information presented and it caused a lesser understanding of the material.

> *I don't like to do things on the phone, I like to use the computer. It will be the big screen; I will have full control on it. It is easier to drag and drop, where I can see and place everything well. At first, I tried the mobile phone, I couldn't do it because the sentences are so long, for example, you will have to make matching or drag-and-drop, the sentences are too long, it was physically very tiring for me to move them from one place to another on the screen. Right after my first try, I said I loved computers. I immediately went to the computer and turned it on. Oh, I see everything. (P2)*

> *Telefondan bir şeyler yapmayı hiç sevmem bilgisayar kullanmayı seviyorum. Büyük ekran olacak hâkim olacağım ben ona. Her şeyi güzel şekilde görebileceğim, yerleştirebileceğim sürükle-bıraklar daha kolay oluyor. İlk başta cep telefonunu denedim, mümkün değil yapamadım çünkü cümleler o kadar uzun ki, mesela eşleme yaptıracaksınız veya sürükle-bırak yapacaksınız, cümleler aşırı uzun, onları ekranda oradan oraya taşımak fiziksel olarak benim için çok yorucu oldu. İlk*

denememden hemen sonra bilgisayarın gözünü seveyim dedim. Hemen bilgisayara geçtim oradan açtım. Oh mis gibi her şeyi görüyorum. (P2)

Participants also expressed verbally that their concentration was distracted when they wanted to study in different places rather than their workplace.

I'm not so sure, while people are on the road, commuting by bus or the subway, I wonder if they will open it. I think they can't. For example, vocabulary is a slightly easier subject, but would I learn the game, and something related to it? Even if I was young, I would not prefer mobile learning since it requires concentration because I would prefer to do it calmly sitting in a quiet environment, but this of course might be related to my age, or it might be because I am not used to. But I thought I wouldn't want to do something like this on a mobile phone. (P4)

Şeyden çok emin değilim, insanlar yolda giderken otobüsle giderken metroda giderken acaba açar bunu yapar mı? Yapamaz diye düşünüyorum. Mesela kelime bilgisi biraz daha kolay bir konu ama oyun ve bununla ilgili şey ben öğrenir miydim? Genç bile olsam konsantrasyon gerektirdiği için tercih etmem mobil öğrenmeyi çünkü oturup sakin bir şekilde dingin bir ortamda yapmayı tercih ederim ama bu tabi yaşımla da ilgili olabilir, alışkanlıklarım olmadığı için de olabilir. Ama bu tarz bir şeyde cep telefonu ortamında yapmak istemezdim diye düşündüm. (P4)

One participant explained her challenge to type long sentences on mobile device. She stated that she had to spend a lot of time using the backspace key and type all over since she had trouble typing on small screen.

You'll see a lot of typos I made while writing the lesson plan. I did all of this on my mobile phone. I tried to type everything completely from the phone. There is a typo there. I fixed it at the first time, I fixed it at the second time, then I let myself go with the flow in the others. (P3)

Ders planını yazarken yaptığım bir sürü yazım hatası göreceksiniz. Bunların hepsini cep telefonu üzerinden yaptım. Tamamıyla her şeyi telefondan yazmaya çalıştım. Orada yazım hatası çıkıyor. Bir düzelttim, iki düzelttim, diğerlerinde artık akışına bıraktım kendimi. (P3)

Another hurdle that some participants had was sharing their homework on the mobile devices. They were expected to upload their homework to Drive and create a shareable

link on Schoology. One participant highlighted the importance of aiding learners who have a problem with this situation.

It was a little difficult for me to share homework on the phone. It may be difficult for a teacher with no technology knowledge. So is he using Gmail or using Drive? Fortunately, I was using it, we did not know how to share it, but a friend at school taught it, but this was the first time I shared a link from a mobile phone in this way. Yes, it can be difficult for someone doing it for the first time. That's why it might be good to give something like how to contact and who to contact in the program, and when you can't, you can send an e-mail and put something like this here. (P1)

Telefondan ödev paylaşımı yapmak biraz zor oldu benim için. Hiç teknoloji bilgisi olmayan bir hoca için zor olabilir herhalde. Yani Gmail kullanıyor mu Drive kullanıyor mu. Neyse ki ben kullanıyordum, onun paylaşımını bilmiyorduk da okuldaki bir arkadaş öğretmişti ama cep telefonundan mobilden bu şekilde ilk kez link paylaştım ben. Evet ilk defa yapacak birisi için zor gelebilir. Bu yüzden program içerisinde how to contact ve who to contact diye bir şey vermek, yapamadığınızda bir mail atabilirsiniz şuraya gibi bir şey koymak bu yüzden iyi olabilir. (P1)

On the other hand, another participant stated that she was confused about how to upload her homework first but then, she was able to explore what to do after reading the clear instructions given in the task.

In the how to submit assignments section, you have explained very well what to do according to your system or what to do in which steps. Because sometimes I lost what to do there, so I couldn't find how to send it. That's why it was so good to have them. I got back to uploading that lesson plan in the end. First I prepared it, then I didn't quite understand how to do it. Although I used the drive folder before, but for some reason I couldn't do it at that moment. I was able to do it later when I went back and read the steps. (P5)

How to submit assignments kısmında sisteminize göre ne yapacağınızı gayet güzel şekilde anlatmışsınız ya da hangi adımlarda ne yapılacağını. Çünkü bazen burada ne yapacağımı kaybettim, yani nasıl yollayacağız diye bulamadığım oldu. Onun için bunların olması çok iyi oldu özellikle. En son o ders planını yüklemekle ilgili çok ona geri döndüm. Önce hazırladım, sonra nasıl yapacağımı tam da anlamadım. Gerçi daha önce drive klasörünü kullanmıştım ama o an nedense yapamadım. Geriye dönüp adımları okuyunca daha sonra yapabildim. (P5)

4.1.2.2.2.2 Theme 2: Suggestions about usability in prototype 1

This theme represents the suggestions towards the improvement of the mTPD course in terms of its usability. There are two subthemes: course navigation could be improved and sentences in some questions could be shortened. These two subthemes are explained with quotations below.

Four participants shared their opinions regarding the difficulty to go to the desired link in the course. One participant suggested to include a course index to be able to view all content in one page so that they would be able to look up the necessary content practically when necessary.

I like being able to see everything, but to see everything, I have to go inside and search one by one, I mean there was no navigation tool. In other words, if there had been, I could have gone straight to the module, but I searched inside the modules to see where I saw that. There is no index so I think there should be an index. (P2)

Her şeyi görebiliyor olmak hoşuma gidiyor ama her şeyi görebilmek için içine tek tek girip aramam gerek, yani bir navigation tool yoktu. Yani bu olsaydı, hangi modülde ne anlatılıyor hemen gidebilirdim ama şunu nerede görmüştüm acaba diye aradım modüllerin içinde. Bir indeks yok yani bir indeksin olması gerektiğini düşünüyorum. (P2)

Another suggestion regarding the usability of the mTPD course was the need for shorter sentences in the achievement tests. One participant stated that he struggled to read long sentences on his mobile device. Simplifying these sentences might help the learners comprehend the questions more easily when they are on their mobile devices.

Some articles were unfortunately too long, I mean, due to mobile device compatibility. I remember there were a few lines of items. You know, this is not what we prefer in testing, I mean, because of face validity. I mean, I don't know how much you can control this but, it is also related to the screen size of my mobile device, but I just wanted to mention this. I mean, there were some long items, but maybe simplifying, I don't know, could be a little better. (P3)

Bazı maddeler maalesef çok uzundu, yani mobil cihaz uyumluluğundan dolayı. Birkaç satır madde olduğunu hatırlıyorum. Hani bu testingde çok tercih edilen bir şey değil, yani yüz geçerliliği sebebiyle. Hani ona ne kadar müdahale edilebilir bilmiyorum ama, yani mobil cihazımın ekran boyutu ile de alakalı ama bunu da belirtmiş olayım. Yani biraz uzun maddeler vardı ama belki basitleştirilmesi, bilmiyorum, biraz daha iyi olabilir. (P3)

4.1.2.3 Perceptions About the Effectiveness of the mTPD Course

4.1.2.3.1 Quantitative Findings

Participants (n=8) were asked questions investigating their perceptions regarding the effectiveness of the mTPD course (Table 4.6). 50% of the participants (n=4) stated that they were thinking about taking another mTPD course in the future, while 25% of the participants (n=2) were indecisive, and one participant had a strong disagreement towards this statement. They were also asked if they learned as much information as they would in an in-person TPD course. 75% of the participants (n=6) agreed with this statement while 25% of the participants (n=2) were not sure. 62.5% of the participants (n=5) stated that they preferred mTPD courses to in-person courses while 25% of the participants (n=2) were indecisive and one participant would prefer in-person TPD courses to mTPD courses. Lastly, 75% of the participants (n=6) agreed that mobile learning is a productive and convenient approach for TPD programs while 25% of the participants (n=2) were indecisive about this statement.

Table 4. 6

Results of the Course Evaluation Questionnaire About Effectiveness in Prototype 1

	Completely agree		Agree		Not sure		Disagree		Completely disagree	
	n	%	n	%	n	%	n	%	n	%
I am thinking about taking another mTPD course in the future.	1	12.5	4	50	2	25	-	-	1	12.5
In this mTPD course, I learned as much as I would in an in-person TPD course.	4	50	2	25	2	25	-	-	-	-
I prefer mTPD courses to in-person TPD courses.	3	37.5	2	25	2	25	1	12.5	-	-
Mobile learning is a productive and convenient approach for TPD programs.	3	37.5	3	37.5	2	25	-	-	-	-

4.1.2.3.2 Qualitative Findings

The themes related to the effectiveness of the mTPD course are benefits and suggestions. The main themes and subthemes are presented in Table 4.7. Each theme will be explained further using quotations from transcripts to illuminate participants' experience about the effectiveness of the mTPD course.

Table 4. 7

Themes and Subthemes About Effectiveness in Prototype 1

Themes	Subthemes
Benefits	• Learning anytime and anywhere is possible due to mobility • Enabled autonomous learning • Enabled realization of using digital games as authentic learning sources • Prompted a way to reach students • Enabled the application of theory into practice • Provided an effective guideline • Provided information and know-how from the experts in their fields
Suggestions	• Need for feedback about course progress • Target group of the mTPD course • The need for more time • Need for providing cooperation

4.1.2.3.2.1 Theme 1: Benefits of the mTPD course in prototype 1

This theme identifies the perceptions of participants about the benefits they gained through the mTPD course. There are seven subthemes under this theme: learning anytime and anywhere is possible due to mobility, enabled autonomous learning, enabled realization of using digital games as authentic learning sources, prompted a way to reach students, enabled the application of theory into practice, provided an effective guideline and provided information and know-how from the experts in their fields. Each subtheme is explained below using examples from the interviews.

All five interviewees stated that the mTPD course gave them opportunities to learn anytime and anywhere at their own convenience due to using a portable device. They also stated that it wouldn't have been possible for them to attend the program if it had been an in-person course. One participant said that the possibility of using the program in different places let her learn despite time and place restrictions.

Even while I was cooking, I could listen to a video putting on my headphones, which is a huge advantage for me because sometimes it's just a waste of time. I was able to continue learning wearing my headphones while standing, downstairs, upstairs, on the move, or taking a taxi and going somewhere for some hours that killed my

routine day. So I have time to learn a lot in a day, without causing too much fatigue. The second is that I can go back and look, I mean I can do that on the computer, but the computer is something that is fixed here, I don't need to sit in front of it. As I said, when I was busy, while I was waiting in line, I looked again and thought, I wonder how I should do it on the lesson plan, or if I could play the game a little more, let's see what else I can do. I can say that it gave me a freedom, I mean, it provided me with ease of time and place. (P3)

Yemek pişirirken bile kulağıma takıp bir videoyu dinleyebiliyordum, bu bana çok büyük bir avantaj çünkü bazı zamanlar bana vakit kaybı. Rutin günümü öldüren bazı saatleri ayakta, alt katta, üst katta, hareketliyken ya da taksiye binip bir yere giderken kulaklığımı takıp devam edebiliyordum. Demek ki bir günde çok şey öğrenebilecek vaktim var, hem de çok aşırı yorgunluğa yol açmadan. İkincisi geri dönüp bakabilmem, yani bu bilgisayarda da olabiliyor ama bilgisayar buraya sabit duran bir şey, buraya yapışmama gerek kalmıyor. Dediğim gibi hareketliyken, başka bir yerdeyken sırada beklerken tekrar bakıp, acaba ders planı vardı orada nasıl yapsam acaba diye düşündüm veya şu oyunu biraz daha oynasam, bakalım neler varmış ne yapabilirim acaba diye. Bana bir freedom verdi yani zaman ve mekân kolaylığı sağladı diyebilirim. (P3)

Another interviewee highlighted the advantage of mobile learning saying that she wouldn't be able to participate in the course if it hadn't been mobile since she had a hectic schedule at school. She also added that teachers feel safer in a mobile learning setting as a learner than they are in an in-person learning setting.

I think it's advantageous because if you had come to me and told me to do it, I wouldn't have even if there had been no pandemic because it is important that it's free from place and time. It is an advantageous situation for people who teach because the time spent at school is normally very long and it is tiring. Teachers would not want to learn in the setting where they teach. That's why it's very advantageous to be online or remote, or even something mobile like this. I mean, they can put their child on the bed and study. (P5)

Bence avantajlı çünkü bunu bana gelip yap deseydiniz pandemi olmasaydı da ben gelmezdim çünkü şey önemli hakikaten yer ve zamandan bağımsız olması. Öğretmenlik yapan insanlar açısından avantajlı bir durum çünkü okulda geçirilen zaman çok uzun normalde ve yorucu bir ortam. Öğretmen kendisinin öğretmenlik yaptığı ortamda öğrenmeye gitmeyecektir diye düşünüyorum o yüzden çevrimiçi

yani uzak olması ya da bu tarz mobil bir şey olması bile çok avantajlı yapar yani çocuğunu yatağa yatırır oturur yapar. (P5)

Three interviewees reported that the mTPD course enabled autonomous learning. In other words, they were able to control their own learning by taking decisions according to their situations. For example, one participant said that she was able to participate in the course by creating her own learning schedule despite her busy schedule.

I spent several hours in a row on the weekend, for example, completing two units in a row. In other words, there was a flexibility brought about by the fact that the program was mobile. Maybe if I didn't have such an option, I would have been excluded from this study because I wouldn't be able to attend a face-to-face session that day at that time. (P1)

Hafta sonu arka arkaya birkaç saat geçirip mesela iki üniteyi arka arkaya tamamladım. Yani programın hani mobil olmasının da getirdiği bir esneklik vardı. Belki de böyle bir seçeneğim olmasaydı ben o gün o saatte yüz yüze oturuma katılamadığım için bu çalışma dışında kalacaktım. (P1)

Another interviewee highlighted the importance of autonomous learning from a different viewpoint. She stated that the nature of mobile learning let her create her own safe learning space without having learning anxiety.

I liked this course because it offers the opportunity to learn independently. For example, I answered a question incorrectly in a way that I never expected, I went back and looked at the content again. If we were in-person somehow, maybe I would feel bad about my identity as a teacher in front of other teachers. I mean, maybe I would be with much younger teachers and inexperienced teachers, and I could also have such a thought because of my teacher identity. It totally saved me from that. (P5)

Bağımsız öğrenme imkanı sunduğu için sevdim bu dersi. Dedim ya, mesela bir soruyu hiç beklemediğim bir şekilde yanlış cevaplamışım, geri dönüp tekrar içeriğe baktım. Bir şekilde işte yüzyüze olsaydık belki de başka öğretmenlerin yanında öğretmen kimliğimle kötü hissedecektim. Yani belki de çok daha genç hocalarla tecrübesiz hocalarla bir arada olacaktım ve de onların yanında öğretmen

kimliğinden dolayı böyle gibi bir düşünce içerisine de girebilirdim. Bundan tamamen kurtardı yani beni. (P5)

All five interviewees stated that the mTPD course enabled realization of using digital games as authentic learning sources. Participants reported that using digital games in language learning carries a great potential, but they had never thought that they could integrate them in class as a learning source. One participant said that she would use digital games as a classroom activity as an alternative to other conventional classroom activities.

The training I received from you made me think of something I had never thought of, I mean, that I could also use games as an original material. So you gave me such an idea. I mean, I've never thought of anything like this before. I was using many things but never thought of using games. In everything else I normally make an introduction in a reading lesson, I make a listening activity, I do an activity as a post-reading activity, I asked myself why not do these in a game, and I had all my buttons. (P4)

Sizden aldığım eğitim bende şöyle bir şey uyandırdı, hiç düşünmediğim bir şeyi düşündürdü, yani orijinal bir malzeme olarak oyunları da kullanabileceğim fikrini bende uyandırdı. Yani siz bana böyle bir fikir verdiniz. Ben daha önce hiç böyle bir şey düşünmemiştim yani. Ben birçok şey kullanıyordum ama oyunları kullanmayı hiç düşünmemiştim. Neden olmasın, diğer her şeyde bir readingde giriş yaparken ne yapıyorsam bir dinlemeyi nasıl yapıyorsam, bir okuma sonrası aktivite olarak ne yapıyorsam neden bunları bir oyun içinde yaptırmayım dedim ve dimağım açıldı genişledi. (P4)

Three interviewees reported that the mTPD course prompted a new way to reach their students. They said that one of the challenges that they faced at one point or another was to reach students who had different interests outside the classroom. For example, one interviewee said:

It is necessary for the teachers to learn this because game is something that covers a significant part of the lives of our students. Therefore, it does not necessarily have to be a game that they play, for example, Minecraft or Simsity, but I think it will

definitely be productive to try to teach them something with a different approach with computers. (P2)

Mutlaka hocaların bunu öğrenmesi gerekiyor çünkü oyun bizim hitap ettiğimiz öğrenci kitlesinin hayatlarının önemli bir kısmını kapsayan bir şey. Dolayısıyla illa onların oynadığı bir oyun olması gerekmiyor yani mesela Minecraft veya Simsity olması gerekmiyor ama onlara bilgisayar ortamında farklı bir yaklaşımla bir şeyler öğretmeye çalışmanın mutlaka verimli olacağını düşünüyorum. (P2)

All five interviewees also reported that the mTPD course enabled the application of theory into practice. Teachers stated that there was a bridge between theory and practice in the mTPD course and that they were able to do activities to apply in practice after learning the theory. One participant explained the relationship between theory and practice in the mTPD course with these words:

If you are using games as a teaching tool theoretically, if you want to understand the theory and wonder what principles it is based on, I would say it is a program that you will find what you are looking for. Or if you are already using games, I would say that they would find it useful in terms of making a difference or improving your skills as to what details might be important in the implementation process. Or, after learning something theoretically, I would say to the interested parties that you can find what you are looking for in this program to find out which rules may be binding, and which details may be important. (P2)

Teorik anlamda halihazırda oyunları bir öğretim aracı olarak kullanıyorsanız teorisini anlamak ve hangi ilkelere dayandığını merak ediyorsanız aradığınızı bulacağınız bir program derdim. Ya da halihazırda oyunları kullanıyorsanız hangi detayların uygulama sürecinde önemli olabileceği konusunda farklılık kazanmak ya da becerilerinizi geliştirmek anlamında faydalı bulacaklarını söylerdim. Ya da bir şekilde teorik olarak bir şeyler öğrendikten sonra öğrendiklerini pratiğe dökmek için, hangi kuralların bağlayıcı olabileceğini hangi detayların önemli olabileceğini bulmak için yine bu programda aradığınızı bulabilirsiniz derdim ilgililere. (P2)

Three interviewees reported that the mTPD course provided them an effective guideline to prepare a lesson using digital games in their classrooms. One participant said that this course gave him an awareness about how to effectively use digital games with proper language teaching methodology.

As a teach with 10 years of experience, I probably could not have created a 5-step or 4-step lesson plan in a similar way, or I could not have followed the PCaRD model accurately. If I had not participated in this course, I would have designed a game lesson without knowing what I am doing, without knowing what I am going to change, without knowing which variables will change and what will change what and how. If I had not participated in this training, I would have designed a lesson that would not even come close to the lesson I have already prepared, but I would have done something without such a pedagogical and sound approach and informed decisions, so I would have only used games. (P5)

10 yıllık hocalık kimliğimde benzer bir şekilde 5 adımlı ya da 4 adımlı bir ders planı oluşturamazdım herhalde ya da PCaRD modelini harfi harfine takip edemezdim. Eğer bu eğitime katılmamış olsaydım ve yaptığımın neye hizmet ettiğini bilmeden, neyi nasıl değiştirirsem hangi değişkenleri değiştirip nelerin neleri nasıl değiştireceğini bilemeden öngöremeden bir oyun dersi tasarımı yapmış olurdum. Bu eğitime katılmasaydım bu halihazırda hazırlamış olduğum dersin yanına bile yaklaşamayacak bir ders tasarlamış olurdum ama böyle pedagojik ve sound yaklaşımım ve informed kararlarım olmadan bir şey yapmış olurdum yani sadece oyun kullanmış olurdum. (P5)

Three interviewees were content with the fact that mTPD course provided information and know-how from the experts in their fields. One participant stated that he put his trust in the information he got from the expert.

I thought that the first-hand accounts and what was told there were reliable information. That's the first thing that comes to my mind, so I liked the fact that those YouTube videos and so on were explained by experts and that I could reach them at first hand, and I thought that this information could be trusted. (P4)

Birinci elden konuşmaların ve oradan anlatılan şeylerin güvenilir bilgiler olduğunu düşündüm. Aklıma ilk o geliyor, yani oradaki o YouTube videolarının vesairelerin uzmanlar tarafından anlatılması ve ilk elden ona ulaşmam hoşuma gitti ve bu bilgilere güvenilebilir diye düşündüm. (P4)

4.1.2.3.2.2. Theme 2: Suggestions for effectiveness in prototype 1

This theme identifies the suggestions that the participants shared with the researcher to contribute to the effectiveness of the mTPD course. There are four subthemes: need

for feedback about course progress, target group of the mTPD course, need for more time and need for providing cooperation. Each subtheme is explained below using quotations from the interviews.

The first finding was the need for feedback about course progress. One interviewee reported that she sometimes expected an explanation from the course trainer as to how she was doing in the course and what was accurate or inaccurate about her work.

> *Writing to someone and a feeling of interaction, I mean, the feeling of getting feedback from the teacher. So I wonder how I'm going, what do they think, if I'm going well, these are the things you want to know. Am I thinking on the right track, I wonder how the other friends are doing. I am like this, but how are they doing? I would like to see how I am making out, I mean, to get a tip from someone who does it better than me. Are they disadvantages, I mean, it seems like a disadvantage since we cannot experience here fully. Maybe if it occurs more vividly in the other implementation, I think the disadvantage will disappear. (P4)*

> *Birilerine yazmak ve bir etkileşim hissiyatı yani hocadan bir dönüt alma hissi. Yani ben nasıl gidiyorum acaba, ne düşünüyorlar acaba, gidişim iyi mi, yani bunu bilmek istiyorsunuz. Doğru yolda düşünüyor muyum yani, bir de diğer arkadaşlar nasıl gidiyor acaba. Ben böyleyim ama onlar nasıldı acaba. Bir boyumun ölçüsünü görmek yani benden daha iyi yapan birinden bir tüyo almak isteği oluyor. Onlar dezavantaj mı, yani burada tam olarak yaşayamadığımız için bir dezavantaj olarak görünüyor. Belki öbür uygulamada daha canlı olarak oluşursa dezavantajı kaybolur diye düşünüyorum. (P4)*

The interviewees also shared their opinions about who this mTPD course was appropriate for. One participant said:

> *I would say that since the program is basically designed to address people who have never used games before, people who are at the very beginning of the road, the course appeals to practitioners with a wide profile and they can actually find what they are looking for. (P2)*

> *Program temelden aslında daha önce herhangi bir şekilde oyunları kullanmamış kişilere, yolun en başında olan kişilere cevap verecek şekilde tasarlandığı için aslında geniş profildeki uygulayıcılara hitap edip herkesin aradığı şeyleri bulma imkanın olduğunu ifade ederdim. (P2)*

Another participant (P1) stressed on the importance of the self-motivation that triggers teachers' desire to continue their professional development with the following: "I think it would be suitable for a self-directed and highly motivated teacher." "Self directed olan ve gayet motiveli bir hocaya uygun olur diye düşünüyorum."

Three interviewees stated that they struggled to keep up with the course and they needed more time to complete the course. One participant said that she stressed over the lesson planning task because of her heavy schedule, and she would have prepared a better lesson plan if she had been given more time. Another interviewee gave a suggestion for this situation:

You can give more time, especially for lesson planning in try-out part, because when planning a sample lesson, one may need to go back and read it or look at the video and do it again. (P5)

Daha çok zaman verebilirsiniz, özellikle uygulamada ders planlamasında mesela, çünkü örnek bir ders planlarken geri dönüp okuyup ya da işte videosuna bakıp tekrar yapması gerekebilir kişinin. (P5)

Lastly, one interviewee highlighted the importance of providing cooperation in the course. She suggested that using discussion forums might be an effective way to engage cooperation among the learners.

A little help may be good, it may not be the same for everyone, of course, but one wonders how the person next to him is doing. You know, in the classroom there comes a moment when you say, I didn't study, how about you, oh well, I studied, or I did not understand. It would be good if there is someone with whom we can share our feelings or someone helping us by telling us to write there by clicking here. Although there is a discussion section there, it might be good to encourage teachers to use it effectively. There may be a feeling that I want to hold hands with someone. (P5)

Ufak bir yardımlaşma iyi olabilir, herkese öyle olmamış da olabilir tabii ama insan yanındakinin nasıl yaptığını merak ediyor. Hani sınıfta olur, ben çalışmadım ya sen, ben de, oh neyse, ben çalıştım ya da anlamadım hislerini paylaşabileceğimiz ya da ya orada şuraya tıklayarak yazacaksın diyerek birisinin yardım ediyor olması

*iyi olur. Gerçi orada tartışma bölümü var, hocaların bunu etkin olarak
kullanmasına yöneltmek belki iyi olabilir. Bir o his gelebiliyor yani el ele tutuşmak
istiyorum birileriyle. (P5)*

4.1.3 Research Question 2

Participants were given 'Using Digital Games in Teaching Questionnaire' before and
after the mTPD course to investigate the change in their perceptions. There was a total
of 19 items to evaluate their perceptions. Participants expressed their opinions on a
five-point scale, 'strongly agree (1), agree (2), not sure (3), disagree (4), and strongly
disagree (5)'. Descriptive results of the DGELL questionnaire were given in Table 4.8.

Table 4. 8 (continued)

Descriptive Results of the Perception Questionnaire in Prototype 1

	Pretest			Posttest		
	n	M	SD	n	M	SD
1. Digital games enhance the quality of my job.	8	4.50	0.54	8	4.13	0.84
2. Digital games in my job increase my productivity.	8	3.63	0.74	8	3.50	1.07
3. Digital games enhance my effectiveness in my job.	8	3.63	0.74	8	3.50	1.07
4. I find digital games to be useful in my job.	8	4.38	0.52	8	4.00	0.76
5. Using digital games makes teaching easy.	8	3.63	1.06	8	3.50	0.93
6. I know how to use digital games in classroom setting.	8	3.50	0.76	8	3.63	0.92
7. I have the necessary skills to use digital games in a classroom setting.	8	3.75	0.71	8	4.00	0.76
8. I have used digital games before in classroom.	8	3.63	0.92	8	2.13	1.13
9. I have experience with the use of digital games in the classroom.	8	3.38	1.06	8	1.88	1.25
10. Digital games offer opportunities to experiment with knowledge.	8	4.25	0.46	8	4.13	0.64

(continued)

Table 4.8 (continued)

Descriptive Results of the Perception Questionnaire in Prototype 1

	Pretest			Posttest		
	n	M	SD	n	M	SD
11. Digital games offer opportunities to take control over the learning process.	8	4.13	0.64	8	4.13	0.84
12. Digital games offer opportunities to experience things you learn about.	8	4.38	0.52	8	4.13	0.84
13. Digital games offer opportunities to stimulate transfer between various subjects.	8	4.13	0.84	8	4.25	0.98
14. Digital games offer opportunities to think critically.	8	3.88	0.84	8	4.25	0.71
15. Digital games offer opportunities to motivate students.	8	4.38	0.52	8	4.13	0.84
16. Digital games fit the curriculum.	8	3.25	0.71	8	3.25	0.89
17. It is clear how digital games can be used to fit the curriculum.	8	2.63	0.92	8	3.25	1.04
18. I am planning to use digital games in the classroom.	8	4.00	0.76	8	3.13	1.13
19. In the future, I intend to use digital games in the classroom.	8	4.13	0.84	8	3.25	1.28

Using Digital Games in Teaching Questionnaire is composed of six constructs. These are usefulness (items between 1-5), ease of use (items 6-7), experience (items 8-9), learning opportunities (items between 10-15), curriculum relatedness (items 16-17) and behavioral intention (items 18-19). A Wilcoxon-signed rank test was conducted to determine whether there was a significant change in the perceptions of the participants regarding these constructs before and after the mTPD course (Table 4.9). In order to avoid inflated Type 1 error, the *p*-value was adjusted using Bonferroni correction. Results of the analysis indicated no significant change in participants' perceptions regarding their experience with the use of digital games in classrooms before and after the mTPD course in the first prototype.

Table 4. 9

The Results of the Wilcoxon-Signed Ranks Test of Perceptions Regarding Digital Games in Prototype 1

	Before the course Mdn (min-max)	After the course Mdn (min-max)	n	T	z	*p*
Usefulness	19.50 (16 – 25)	17.50 (13 – 25)	8	13.5	-.631	.528
Ease of use	7.50 (6 – 9)	7.50 (6 – 10)	8	9.0	-.333	.739
Experience	8 (3-9)	3 (2 – 8)	8	36.0	-2.527	.012
Learning Opportunities	24.50 (22 – 30)	24.50 (18 - 30)	8	16.0	-.339	.734
Curriculum relatedness	6 (4 – 8)	6.50 (5 – 10)	8	11.5	-.426	.670
Behavioral intention	8 (6 - 10)	6 (2-10)	8	10.0	-1.841	.066

Note: Mdn: Median. An increase in the median scores means an increase in agreement in the results of the perception questionnaire. *p* value was adjusted for multiple comparisons with Bonferroni. * $p < .008$

4.1.4 Research Question 3

The last research question seeks to understand how much the mTPD course on DGELL contributes to participants' knowledge on DGELL in theory and practice. To this end, the research question was investigated using two different data collection techniques. First, an achievement test was given to the participants before and after the mTPD course to see how the mTPD course affected their theoretical knowledge on DGELL. Second, participants were asked to prepare a lesson plan on DGELL to understand if they were able to apply this knowledge acquired from the mTPD course in a lesson plan. By using the lesson plan assessment, the researcher was able to investigate if

participants were able to apply this new approach by using their pedagogical content knowledge and not just recite the theory behind it. The pretest of achievement was completed by eight participants while the posttest of achievement was completed by six participants. Therefore, the pretest scores of these two nonperforming participants were excluded from the results of the achievement test. A Wilcoxon-signed ranks test was conducted to evaluate whether participants' achievement test scores changed significantly after the mTPD course (Table 4.10). The results indicated a significant change, $Z = 2.21$, $p < .05$, r= .78. The median of the ranks of the pretest was 10.50, while the median of the ranks of the posttest was 15.50. It can be concluded that participants' achievement increased significantly after taking the mTPD course.

Table 4. 10

Results of the Wilcoxon-Signed Ranks Test of Achievement in Prototype 1

	Before the course Mdn (min-max)	**After the course** Mdn (min-max)	n	T	z	p
Achivement	10.50 (6 – 13)	15.50 (12 – 18)	6	21	2.21	.027*

Note: Mdn: Median; min:minimum score; max: maximum score

* $p < .05$

At the end of unit 3 in the mTPD course, participants were expected to create a lesson plan which was supposed to include multiple aspects of their pedagogical content knowledge on DGELL. A total of four participants submitted their lesson plans. The researcher collected these lesson plans and analyzed them with a holistic rubric (Appendix E). The rubric was one dimensional and it assessed participants' overall achievement of the task. The criterion of the rubric was to use PCaRD model while integrating a digital game into their teaching and develop pedagogical activities in each phase of PCaRD model that is in congruent with the DGELL approach. As can be seen in Table 4.11, none of the participants were able to get a full score, which means that they were not able to demonstrate a complete understanding of the DGELL and use all

the phases of PCaRD model consistently. There was one participant who showed a considerable understanding of the subject matter in practice. Two participants executed the components of PCaRD model in their lesson plans partially and they developed few activities relevant to the phases of the lesson. One participant got the lowest score (1) because she didn't include the components of PCaRD model in her lesson plan and she developed the activities with limited understanding of DGELL.

Table 4. 11

Lesson Plan Assessment Scores of Participants in Prototype 1

Criteria	n	%	Score
1. Lesson plan demonstrates complete understanding and execution of Digital Game-Enhanced Language Learning. It contains all components of PCaRD model, and they are accurately implemented throughout the lesson plan.	-	-	4 (80-100%)
2. Lesson plan demonstrates considerable understanding and execution of Digital Game-Enhanced Language Learning. At least 3 components of PCaRD model are applied but may exhibit inconsistency in terms of balance in developing the phases of the model.	1	25	3 (60-79%)
3. Lesson plan demonstrates some understanding and execution of Digital Game-Enhanced Language Learning. The components of PCaRD model are faintly stated, and the lesson plan is inconsistent in terms of balance in developing the phases of model.	2	50	2 (40-59%)
4. Lesson plan demonstrates limited understanding and execution of Digital Game-Enhanced Language Learning. The components of PCaRD model are not stated, and the lesson plan is simplistic, unoriginal, and/or not is unbalanced in developing the phases of the model.	1	25	1 (1-39%)

Note: Four participants submitted their lesson plans.

4.2 Prototype 2

4.2.1 Description of the Participants in Prototype 2

Participants in the second prototype were 11 language instructors and teachers who were working at universities and state schools in Turkey. The gender, experience, level of education, city, and school of the participants in the second prototype are provided in Table 4.13. All participants (n=11) in the second prototype were female. Regarding their experience, 36.4% of the participants (n=4) had 16 and more years of teaching experience while 9.1% of the participants (n=1) had 11-15 years of experience. 36.4% of the participants (n=4) had experience less 4-10 years of experience and 18.2% of the participants (n=2) had experience less than 3 years. 82% of the participants had a graduate degree (n=9), while 18% of the instructors (n=2) had an undergraduate degree.

Participants were asked to select their ability to use technological devices. The options included basic, moderate, advanced, and expert. As can be seen in Figure 4.5, 73% of the participants (n=8) indicated their skills were moderate in using technological devices, while 27% of the participants (n=3) indicated they were advanced users of technology.
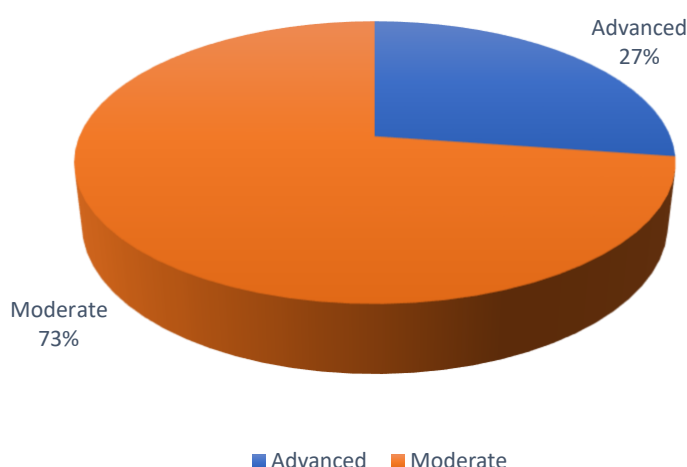
Figure 4. 5. Participants' Level of Ability to use Technological Devices in Prototype 2.

Participants were asked how often they were using technology in teaching activities (Figure 4.6). 36% of the instructors (n=4) indicated they always integrated technology in their classrooms and 55% of the instructors (n=6) said that they often used technology in their teaching activities. 9% of the instructors (n=1) indicated that they sometimes used technology in their teaching. Within this context, participants were also asked how often they were using digital games for teaching in class. 9% of the instructors (n=1) indicated that they were using digital games 1-2 times a week in their classes, while 91% of the instructors (n=10) indicated they never used digital games in their teaching.
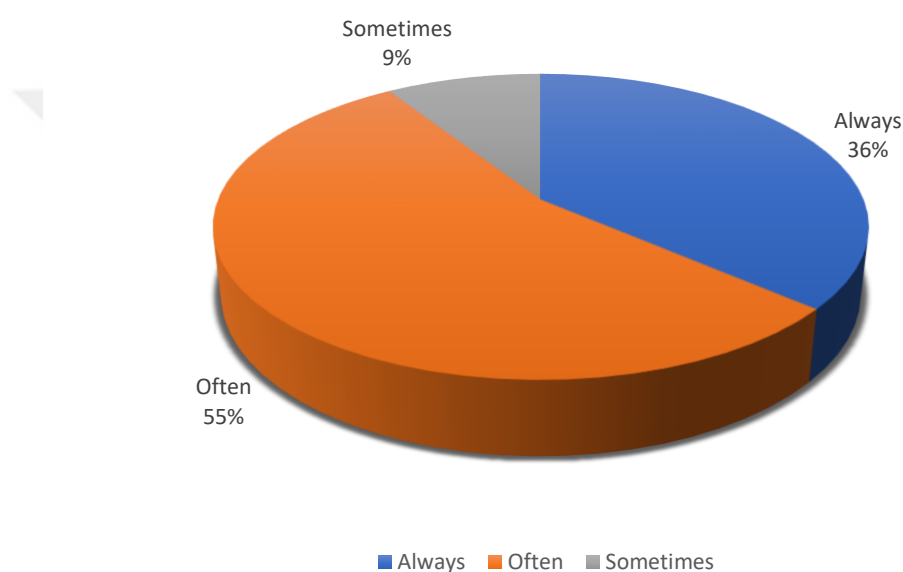
Figure 4. 6. Distribution of Participants Using Technology in Their Teaching in Prototype 2.

Lastly, participants were asked if they had ever participated in any kind of professional development activities about using digital games in language learning. 9% of the instructors (n=1) indicated that they participated a professional development activity about using a digital game in language learning before, while 91% of the participants (n=10) indicated they had never participated in any kind of a professional development activity about digital games in language learning.

4.2.2 Research Question 1

The same procedure was followed as in the first prototype while reporting the findings of the second prototype. The quantitative data obtained from the course evaluation questionnaire and the qualitative data obtained from the interviews were analyzed to investigate the perceptions of participants about the content, usability, and effectiveness of the mTPD course on DGELL. The following sections will explain the results of these findings.

4.2.2.1 Perceptions About the Content of the mTPD Course

4.2.2.1.1 Quantitative Findings

Participants (n=11) were asked how much of the content they completed in the mTPD course (Figure 4.7). 56% of the participants (n=7) stated that they completed all the content in the mTPD course, while 44% of the participants (n=4) stated that they skipped some content. It was found out that 56% of the participants (n=7) participated in the discussion activities and asked questions in the 'Ask your questions here' part. Try-out tasks were completed by 89% of the participants (n=10). All participants stated that they completed all the other parts in the course including warm-up tasks, video lectures, written lectures, lecture tasks and achievement tasks.
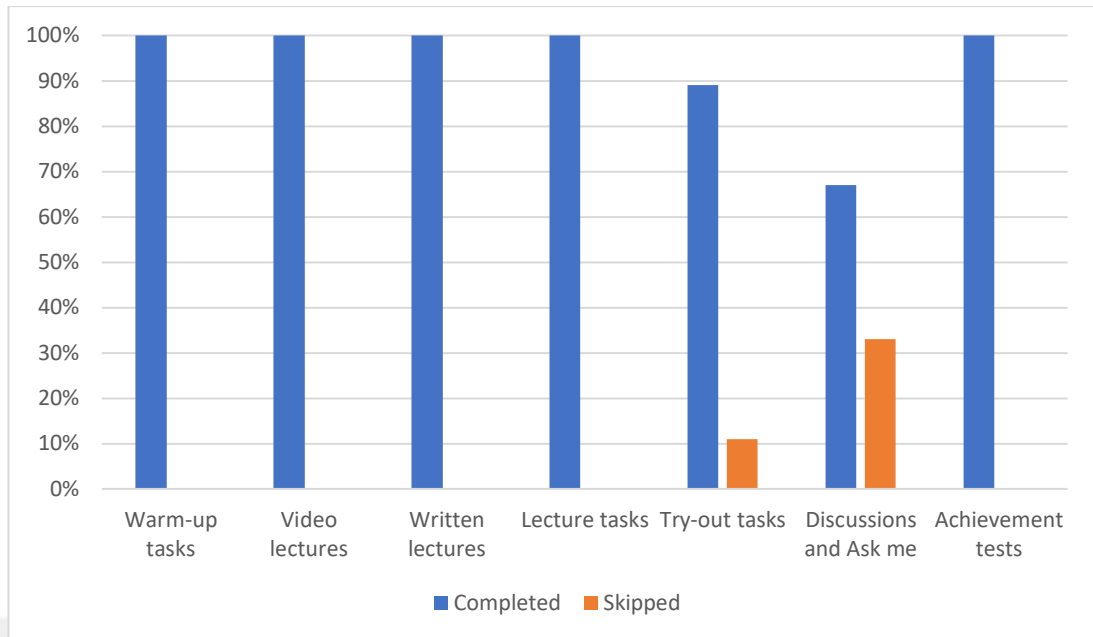
Figure 4. 7. Distribution of Course Content Completed by the Participants in Prototype 2.

Participants (n=11) were asked to decide how important each content of the mTPD course was by using 5-point scale from 'very important' to 'not at all important'. Results of this question can be seen in Table 4.12. All the participants (n=11) agreed on the importance of warm-up tasks, video lectures, written lectures, lecture tasks and try-out tasks. 63.6.5% of the participants (n=7) stated that they found discussion forums important, while 27.3% of the participants (n=3) were not sure about the importance of discussion forums and 9.1% of the participants (n=1) found them slightly important. Lastly, 81.9% of the participants (n=9) found achievement tests important, while one participant found them slightly important, and one participant was not sure about the importance of achievement tests in the course.

Table 4. 12

Results of the Course Evaluation Questionnaire About the Importance of Content in Prototype 2

	Very important		Important		Not sure		Slightly important		Not important	
	n	%	n	%	n	%	n	%	n	%
Warm-up tasks	4	36.4	7	63.6	-	-	-	-	-	-
Video lectures	10	90.9	1	9.1	-	-	-	-	-	-
Written lectures	9	81.8	2	18.2	-	-	-	-	-	-
Lecture tasks	6	54.5	5	45.5	-	-	-	-	-	-
Try-out task	7	63.6	4	36.4	-	-	-	-	-	-
Discussion forums	1	9.1	6	54.5	3	27.3	1	9.1	-	-
Achievement tests	5	45.5	4	36.4	1	9.1	1	9.1	-	-

Perceptions of the participants about the content of the mTPD course were investigated on a five-point scale, 'strongly agree to strongly disagree'. Results of this part of the questionnaire can be seen in Table 4.13. All participants stated that the content was clear, topics of the content followed a logical order, and the content of the course helped them learn how to use digital games in their teaching using Digital Game-Enhanced Language. 88.6% of the participants (n=9) thought that the content of the warm-up tasks was in congruent with the content taught; however, there was one participant who was indecisive and one participant who didn't agree with this statement. 90.9% of the participants (n=10) agreed with the statement that video lectures helped them learn the subjects; however, there was only one participant who was not sure about this statement. All participants (n=11) agreed that written lectures helped them learn the subjects, and rubrics in each activity were sufficient. 90.9% of the participants (n=10) stated that try-out tasks reinforced their learning and 9.1% of the participants (n=1) indicated that they were not sure whether try-out tasks reinforced their learning or not. As in the first prototype, participants of the second prototype implementation shared controversial opinions about the discussion forums. 45.5% of

the instructors (n=5) stated that discussion forums helped them learn other people's opinions about the subject matter, while 27.3% of the participants (n=3) approached this statement cautiously by choosing the 'not sure' option and 27.3% of the participants (n=3) indicated that they didn't agree with this statement. 81.8% of the participants (n=9) stated that achievement tests were good enough to assess their learning while 18.2% of the participants (n=2) stated that they were not sure about this statement.

Table 4. 13 (continued)

Results of the Course Evaluation Questionnaire About the Quality of Content in Prototype 2

	Completely agree		Agree		Not sure		Disagree		Completely disagree	
	n	%	n	%	n	%	n	%	n	%
Content was clear.	6	54.5	5	45.5	-	-	-	-	-	-
Content followed a logical order.	8	72.7	3	27.3	-	-	-	-	-	-
Content of the course helped me learn DGELL.	9	81.8	2	18.2	-	-	-	-	-	-
Content of warm-up tasks were in congruent with the content taught.	7	63.6	2	25	1	12.5	-	-	1	12.5
Video lectures helped me learn the subjects.	7	63.6	3	27.3	1	9.1	-	-	-	-
Written lectures helped me learn the subjects.	5	45.5	6	54.5	-	-	-	-	-	-
Rubrics were sufficient.	10	90.9	1	9.1	-	-	-	-	-	-
Try-out tasks reinforced my learning.	7	63.6	3	27.3	1	9.1	-	-	-	-

(continued)

Table 4. 13 (continued)

Results of the Course Evaluation Questionnaire About the Quality of Content in Prototype 2

	Completely agree		Agree		Not sure		Disagree		Completely disagree	
	n	%	n	%	n	%	n	%	n	%
Discussion forums helped me learn other people's opinions about the subject.	2	18.2	3	27.3	3	27.3	3	27.3	-	-
Achievement tests were good enough to assess my learning.	6	54.5	3	27.3	2	18.2	-	-	-	-

4.2.2.1.2 Qualitative Findings

Interviews in the qualitative phase of the study were conducted with seven participants. Transcripts of the interviews were analyzed through thematic analysis and two themes were provided from the codes about the content of the mTPD course; satisfaction and suggestions (Table 4.14).

Table 4. 14

Themes and Subthemes About Content in Prototype 2

Themes	Subthemes
Satisfaction	• Course content fulfilled my expectations • Satisfaction with content sequencing • Satisfaction with the depth of content • Satisfaction with clear and effective instructions • Satisfaction with the program objectives • Satisfaction with warm-up tasks • Satisfaction with the videos • Satisfaction with try-out tasks • Satisfaction with check your progress part
Suggestions	• Need for more input while teaching new content • Need for support in creating a new lesson plan • A different type of game may be added

4.2.2.1.2.1 Theme 1: Satisfaction about the content in prototype 2

This theme explains how satisfied the participants were regarding the content of the mTPD course. There are nine subthemes under this theme: course content fulfilled my expectations, satisfaction with content sequencing, satisfaction with the depth of content, satisfaction with clear and effective instructions, satisfaction with the program objectives, satisfaction with warm-up tasks, satisfaction with the videos, satisfaction with try-out task and satisfaction with check your progress part. Each subtheme is explained further below using examples from the interviews.

Five interviewees reported that the content of the mTPD course fulfilled their expectations. One interviewee explained the essentials about what is necessary to integrate digital games into language teaching and shared her following ideas about whether the content of this course met her expectations.

> *Teachers need theoretical knowledge on digital learning and digital platforms, so what are these models, what are their theories, is there a scientific basis for this, can I apply it in my lesson? In this respect, I liked the lesson. In this course, what is tpack, what is pcard, what is game enhanced, what is game based, what is the difference between them, what is the purpose of which one, all of them are taught. So the teacher should know this too. We can base our teaching, create materials, and prepare lessons by using existing games. I think it would be helpful to see this too. (P12)*

> *Dijital öğrenme ve dijital platformlar konularında öğretmenlerin teorik bilgiye ihtiyaçları var, o yüzden bu modeller nedir, teorileri nedir, bilimsel olarak bunun bir alt yapısı var mıdır, dersimde uygulayabilir miyim. Bu açıdan ben dersi beğendim. Bu derste tpack nedir, pcard nedir, game enhanced nedir, game based nedir, arasındaki fark nedir, hangisinin amacı nedir, hepsi öğretiliyor. Yani öğretmenin de bunu bilmesi lazım. Hayır zaten var olan oyunları da kullanarak bizim öğretimimize temellendirebiliriz, materyal oluşturabiliriz, ders hazırlayabiliriz. Bunu da görmesinin faydalı olacağını düşünüyorum. (P12)*

All seven interviewees reported that they were satisfied with the sequence of the components of the content for instruction. They stated that the efficient ordering of the

content improved their understanding of the subjects and helped them achieve the objectives. One participant said:

I think the flow of the lesson is very good because at first a plan is given; you know what to do there. After that, there is a warmup activity, so it warms you up for the subject. After that, you already listen to the content of the lesson and you can listen to it many times, I mean, you can do as much as you want. There is a mini test to see if you've learned so you can test yourself afterward. You can see what you did not learn, what you misunderstood, or what and where you missed it. The answers are also coming out, I liked this system, I loved this system. (P19)

Dersin akışı çok güzel bence çünkü ilk başta bir plan veriliyor, ne yapacağını sen orada biliyorsun. Ondan sonrasında bir warmup aktivitesi var, yani derse ısındırıyor seni. Ondan sonrasında dersin içeriğini zaten dinliyorsun ve defalarca dinleyebiliyorsun, yani istediğin kadar yapabiliyorsun. Sonrasında kendini de test etmen için öğrenmiş miyim diye bir mini test var. Sen neyi öğrenmedin, acaba neyi yanlış anlamışsın, ya da neyi nerede eksik almışsın, onu görebiliyorsun. Cevapları da çıkıyor, bu sistemi beğendim, bu sistemi sevdim. (P19)

Five interviewees reported their satisfaction with the depth of content. Depth of the content identifies how comprehensive the coverage of each topic is within a piece of content. One participant said that each content covered its focus topic and both videos and articles were well outlined and structured.

Video lessons were very nice by the way. I think it's better to listen than just read. It was good, I liked the content of the course. The texts, for example, were not very long, so you do not get bored while reading, and they were flowing. For example, you are reading a one-and-a-half-page long text. I mean, I'm talking about the phone by the way. It does not bore you in any way, you are wondering about the other paragraph. Will she talk about that too, yeah it's coming now, it was pretty good for sure. (P13)

Video dersleri çok güzeldi bu arada. Dinlemek daha iyi sadece okumaktansa bence. Güzel benim hoşuma gitti dersin içeriği. Metinler de mesela çok fazla uzun değildi yani okurken sıkılmıyorsun hiçbir şekilde ve akıcıydı. Mesela metin okuyorsun bir buçuk sayfalık bir şey. Yani telefona göre söylüyorum zaten. Orada hiçbir şekilde sıkmıyor seni ve diğer paragrafı merak ediyorsun. Bundan da bahsedecek mi, evet geliyor şimdi kesin gibi güzeldi. (P13)

Two participants explained their satisfaction with clear and effective instructions given in the modules. One participant said that the instructions given in the lesson planning tasks helped her understand everything about the task and she prepared it without having any difficulty.

I did not have any problems while preparing the lesson plan. I mean, the directions given in the instructions for preparing the lesson plan were sufficient. I had no difficulty while preparing the lesson, I mean, I already understood everything, I wrote and sent it directly. (P10)

Ders planı hazırlarken bir sıkıntı çekmedim. Yani şöyle ders planı hazırlamak için verilen yönergelerde yönlendirmeler yeterliydi. Hiç zorlanmadım ders hazırlarken yani kafamda direkt oturmuştu zaten, direkt yazdım ve yolladım. (P10)

Participants were not specifically asked about what they thought about the program objectives given at the beginning of each module. Nevertheless, one participant expressed her satisfaction about the program objectives. She stated that her motivation increased when she learned what she would have learned by the end of each module.

Knowing what to produce, seeing that you will be able to do this or that at the end of the course, learning this motivated me more. I mean, I didn't get into a puzzle, I liked knowing what to do and what to learn from this unit. (P15)

Ne üreteceğini bilmek görmek, yani dersin sonunda bunu bunu yapabileceksiniz görmek, bunu öğrenmek beni daha çok motive etti. Yani bir bilinmezin içine girmedim ne yapacağımı ve bu üniteden ne öğreneceğimi bilmek hoşuma gitti. (P15)

Five interviewees remarked that warm-up tasks had a direct relevancy with the main content of each module. One participant said that warm-up tasks got the learners to begin thinking what would be taught in the modules.

Warm up activities were relevant with the module topics, and they were sufficient, I liked them very much. They showed little by little what would come next. (P13)

Warm up aktiviteleri modül konularıyla ilişkili ve yeterliydi, onları da gayet sevdim. Hani sonrasında ne geleceğini ufak ufak gösteriyordu. (P13)

Three interviewees shared their satisfaction with the videos. All three interviewees put an emphasis on the short duration of the videos, which allowed for more efficient processing and understanding. One participant reported the improvement in her learning experience by saying:

The guys spent a lot of time, and they made a video. I mean, I really liked it. Did I get the answers to the questions in my mind, I got them. I mean, what is more, I mean, I don't have that much theoretical knowledge, but I looked at your lesson map, so I learned this and that. They explained very clearly. For example, one thing I liked very much, the video is not long bro, he put a slide and that's it, the man tells everything, I liked it very much. (P18)

Zaman harcayıp adamlar video yapmışlar. Yani ben çok beğendim. Aklımdaki soruların cevabını aldım mı, aldım. Yani daha fazla nedir, yani o kadar teorik bilgiye sahip değilim ama en son ders haritana da baktım yani, bunu öğrendim şunu da öğrendim diye. Gayet net anlatıyorlar. Mesela şeyi çok beğendim, video uzun değil abi, koymuş bir slayt temiz iş, her şeyi anlatıyor adam onu çok beğendim. (P18)

Six interviewees expressed their satisfaction with try-out tasks at the end of each unit. They stated that they got a better understanding of the course topics by engaging in practical activities such as lesson planning and game playing. One participant stated that she was excited to experience the digital game herself just like students do.

I think that the try-out parts at the end of the units gave us the chance to apply what we learned. I really enjoyed the try-out parts. Play that game for an hour, then come and write something, I was really excited at that part wondering what kind of game it was, and the game was a very enjoyable game. I even got stuck in one part, but that part was my favorite. (P12)

Ünite sonlarındaki uygulama bölümleri bence öğrendiklerimizi uygulama şansı verebilecek nitelikte görevlerde diye düşünüyorum. Uygulama bölümünde gerçekten keyif aldım. O oyunu bir saat oynayın daha sonra gelin bir yazı yazın kısmı var ya, o kısımda gerçekten heyecanlandım yani nasıl bir oyun diye, bir de

oyunda çok keyifli bir oyundu. Bir bölümde bayağı takıldım hatta ama o bölüm en sevdiğim bölüm oldu. (P12)

Regarding the satisfaction about try-out parts, another interviewee stated that she was content with the fact that she was able to apply the new information in a lesson plan activity.

I really enjoyed the lesson plan writing part. I liked it very much, so as a celta maniac, I liked it very much. It was progressing like him, so first the input and then the practice was very good. (P9)

Ders planı yazma kısmı çok hoşuma gitti. Orayı çok beğendim yani bende bir de CELTA manyağı biri olarak orası çok hoşuma gitti. Zaten onun gibi ilerliyordu, ilk önce input sonra pratik çok iyiydi yani. (P9)

Regarding the satisfaction with check your progress part, there were two controversial opinions about the quality of achievement tests. One participant reported that achievement tests were able to measure how well she learned the new material.

The achievement tests at the end of the units were also sufficient in my opinion. I went back and looked at the lesson for some details, I mean, I wasn't sure there. We are trying to see if the program can give the information, I was hesitant to see if I should have looked. I mean the content validity was very high, you asked about everything. I mean, those who don't watch and read cannot do the questions. (P19)

Ünite sonlarındaki başarı testleri de bence yeterliydi. Ben bazı detaylar da geriye dönüp derse baktım yani orada emin olamadım. Hani program bilgiyi verebiliyor mu onu görmeye çalışıyoruz ya, acaba bakmamam mı gerekiyordu diye tereddüte düştüm. Yani içerik validity çok yüksekti, her yerden sormuşsun. Yani soruları yani izleyemeyen ve okumayan yapamaz. (P19)

On the other hand, another participant reported that some of the questions were based on memorization instead of assessing how well they achieved the objectives.

In the part where we assessed ourselves, some questions seemed to be based on memorization. I didn't note which question it was, but it was a bit like that, they were asking about the things directly mentioned in the video. I guess I was expecting

something, something to assess whether we understood or not in general. The open-ended ones were good questions. (P10)

Kendimizi değerlendirdiğimiz kısımda bazı sorular bana çok ezber soru gibi geldi. Hangi soru olduğunu not etmemişim ama biraz böyle videoda direkt geçen şeyleri soruyordu. Ben biraz şey bekliyordum galiba, genel olarak anlayıp anlamadığımızı ölçecek bir şeyler yani. Açık uçlu olanlar güzel sorulardı. (P10)

4.2.2.1.2.1. Theme 2: Suggestions about the content in prototype 2

This theme identifies the suggestions of participants about the content of the mTPD course in the second prototype. There are three subthemes under this theme: need for more input while teaching new content, need for support in creating a new lesson plan and a different type of game may be added. Subthemes will be explained further using quotations from the interviews.

Three interviewees questioned the validity of some content. They reported that they found some of the modules not comprehensive enough and they needed more input to understand them efficiently. One participant reported that she had to search for other sources to grasp the given topic fully.

Sometimes even though I looked at the extra articles, there was a part in which the difference was asked, I had to look at other sources there. It only happened once in the first module. I don't know if this is a problem or not, I don't know if it's about me, but I didn't understand it despite reading it many times. I noted that I did not fully understand the difference between Game based learning and Game enhanced learning, It could be explained a little more. I had to look at other sources. (P18)

Bazen ekstra makalelere bakmama rağmen aradaki fark ne diye bir şey vardı orada başka kaynaklara bakmak zorunda kaldım. İlk modülde oldu sadece bir kere oldu. Bu sıkıntı mı çok değil yani benimle ilgili mi bilmiyorum ama defalarca okumama rağmen anlamadım. Game based learning ve Game enhanced learning arasındaki farkı tam anlamadım diye not almışım, biraz daha açıklanabilir demişim. Başka kaynaklara bakmak zorunda kalmışım. (P18)

Four instructors highlighted the need for support in creating a new lesson plan. They said that while preparing the lesson plan, they had difficulties in creating activities and stated that adding sample lesson plans focused on different language skills to the program would have an impact on preparing better lesson plans.

I really liked the theory part; I would just add more lesson plans before I come to try out and add a lot of guiding information in it to help. So I would develop the lesson plan part more. (P13)

Teori kısmını çok beğendim, sadece try out'a gelmeden daha fazla ders planları eklerdim ve içerisine yönlendirici birçok bilgi eklerdim yardım etmesi için. Yani ders planı kısmını daha fazla geliştirirdim. (P13)

Five interviewees reported that in addition to Life is Strange, which the participants were supposed to play and integrate in their teaching, they expected to see different types of games in the program. One participant stated that she didn't have an appeal to the digital game, Life is Strange, and she would want to choose another alternative game to integrate in her lesson plan.

For example, I would put a sample of a lesson and not limit the game to a single game. For example, it says play the game Life is Strange and then make a lesson plan with the game you played now. After I had that theoretical training there, I hesitated a bit because I couldn't do it, so I mean, I wish it was another game, you know, if there was a variety of games. (P15)

Mesela bir ders örneklemi koyabilirim ve oyunu tek bir oyunla sınırlı tutmazdım. Mesela diyor ya Life is Strange oyununu oynayın ve sonra oynadığınız oyunu şimdi ders planına çevirin. Ben orada o teorik eğitimi aldıktan sonra biraz duraksadım çünkü yapamadım yani, dedim ki keşke başka bir oyun olsaydı hani oyun çeşitliliği olsaydı. (P15)

4.2.2.2 Perceptions About the Usability of the mTPD Course.

4.2.2.2.1 Quantitative Findings

Participants were asked how much time in average they spent for each unit in the mTPD course. 27% of the participants (n=1) stated that they spent between 30 minutes and 1 hour in each unit. 55% of the participants (n=6) spent between 1-2 hours for each unit in the mTPD course and 9.1% of the participants (n=1) spent more than 2 hours for each unit in the course. There was only one participant who spent less than 30 minutes for each unit (Figure 4.8).
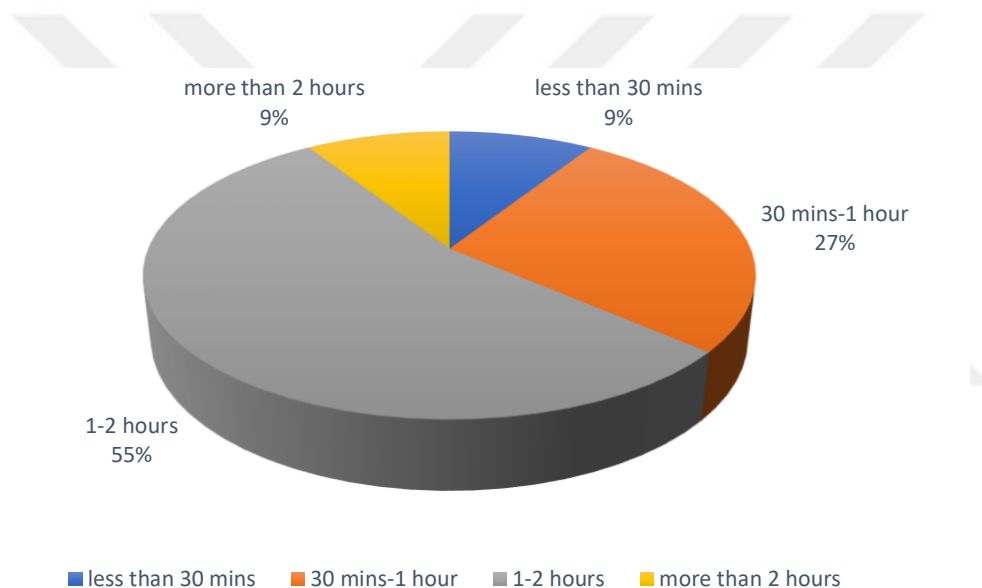
Figure 4. 8. Time Spent on Each Unit in the mTPD Course in Prototype 2.

Participants were also asked in which locations they used the mTPD course more often; their home, workplace or mobile. All instructors (n=11) stated that they were mostly at home while they were studying the course. 66% of the participants (n=6) added that in addition to studying home, they also studied the course at their office or when they were mobile.

Participants (n=11) were asked six questions to assess how well they were able to use different functions of the mTPD course. As can be seen in Table 4.15, 63.7% of the

participants (n=7) expressed positive opinions about the easiness of the course interface, while 27.3% of the participants (n=3) were hesitant and 9.1% of the participants (n=1) thought the course interface wasn't easy to use. All participants (n=11) stated that they were able to open and watch the videos, do and share their assignments on Schoology app without any problem, and log in the course easily. They also thought that all links were working well in the modules. 54.5% of the participants (n=6) were not sure if they were able to communicate with their peers in the discussion forums easily, while 45.5% of the participants agreed that they could communicate with the other learners in discussion forums.

Table 4. 15

Results of the Course Evaluation Questionnaire About Usability in Prototype 2

	Completely agree		Agree		Not sure		Disagree		Completely disagree	
	n	%	n	%	n	%	n	%	n	%
Course interface was easy to use.	4	36.4	3	27.3	3	27.3	1	9.1	-	-
I was able to open and watch the videos easily.	8	72.7	3	27.3	-	-	-	-	-	-
I was able to log in the Schoology course easily.	10	90.9	1	9.1	-	-	-	-	-	-
All links were working well.	11	100	-	-	-	-	-	-	-	-
I was able to do and share my assignments on Schoology app without any problem.	9	81.8	2	18.2	-	-	-	-	-	-
I was able to communicate with other learners in discussion forums easily.	3	27.3	2	18.2	6	54.5	-	-	-	-

4.2.2.2.2 Qualitative Findings

Two main themes were provided from the thematic analysis of the interview data as in the first prototype: challenges and suggestions (Table 4.16). Each theme is explained further using quotations from transcripts to show language teachers' experiences about the usability of the mTPD course in the second prototype.

Table 4. 16

Themes and Subthemes About Usability in Prototype 2

Themes	Subthemes
Challenges	• Screen size could be limiting • Difficulty to download game because of device requirements
Suggestions	• Course navigation could be improved

4.2.2.2.2.1 Theme 1: Challenges

This theme identified the experiences that participants perceived as a challenge in the mTPD course. There are two subthemes: screen size could be limiting and difficulty to download game because of device requirements. These two subthemes are explained below using some examples from the interviews.

Three interviewees stated that learning content and performing tasks on small screens of mobile phones reduced their comprehension and productivity. One interviewee said that she started the course on a mobile phone but after the first unit, she transferred to a laptop and felt more comfortable then.

I also tried to do it on the phone, I think from the first unit, the phone challenged me a little bit, but I don't think we will have any problems when we are on the computer. (P9)

Telefonla da yapmayı denemiştim, sanırım ilk üniteden yani telefon zorladı açıkçası beni biraz ama bilgisayarda olduğumuzda hiçbir sorun yaşayacağımızı sanmıyorum. (P9)

Another challenge about the usability of the mTPD course was the difficulty to download the digital game, Life is Strange, because of device requirements. One participant reported that she was using an older model of mobile phone and she spent some time trying to download the game to her phone, but she gave up after a while and used her husband's phone. However, she still had some problems because of some technical problems she couldn't handle.

I could not download the game you suggested to my mobile phone. After a lot of effort, I tried it on my husband's phone, but those moves cannot be made. I could not continue the action there. I don't know if my commands were very slow and did not progress, but that's why I couldn't enjoy the game in that sense. (P15)

Cep telefonuma o sizin önerdiğiniz oyunu bir türlü indiremedim. Çok uğraştım sonra eşimin telefonundan denedim ama o hamleler yapılamıyor bir türlü. Oradaki aksiyonu ben devam ettiremedim. Benim komutlarım mı çok yavaş algıladı ve ilerlemedi bilmiyorum ama o yüzden ben o anlamda oyunun keyfini çıkaramadım. (P15)

4.2.2.2.2.2 Theme 2: Suggestions

This theme identifies the suggestions towards the improvement of the course in terms of its usability. There is only one subtheme under this theme. Four interviewees reported that course navigation could be improved because they had a hard time finding their way after completing a task or a test. One interviewee remarked that she couldn't see her achievement score after submitting her answers.

We do the activities and there is an attempt, it was confusing to me. I had a hard time seeing what I did afterwards. I wonder if it could be cleaner, so I was doing it and looking where to see it and what score I got. (P10)

Aktiviteleri yapıyoruz ve attempt oluyor, orası karışık geldi bana. Sonradan kendi yaptıklarımı görmekte çok zorlandım. Daha temiz olabilir mi acaba, yani yapıyordum ve nereden göreceğimi ve kaç aldığımı arıyordum. (P10)

4.2.2.3 Perceptions About the Effectiveness of the mTPD Course

4.2.2.3.1 Quantitative Findings

Participants (n=11) were asked questions investigating their perceptions regarding the effectiveness of the mTPD course (Table 4.17). All participants (n=11) stated that they learned as much as they would in an in-person TPD course, and they were thinking about taking another mTPD course in the future. 69.7% of the participants (n=8) stated that they preferred mTPD courses to in-person courses while 27.3% of the participants (n=3) were indecisive. Lastly, 90.9% of the participants (n=10) agreed that mobile learning is a productive and convenient approach for TPD programs while 9.1% of the participants (n=1) were indecisive about this statement.

Table 4. 17

Results of the Course Evaluation Questionnaire About Effectiveness in Prototype 2

	Completely agree		Agree		Not sure		Disagree		Completely disagree	
	n	%	n	%	n	%	n	%	n	%
I am thinking about taking another mTPD course in the future.	10	90.9	1	9.1	-	-	-	-	-	-
In this mTPD course, I learned as much as I would in an in-person TPD course.	6	54.5	5	45.5	-	-	-	-	-	-
I prefer mTPD courses to in-person TPD courses.	1	9.1	7	63.6	3	27.3	-	-	-	-
Mobile learning is a productive and convenient approach for TPD programs.	6	54.5	4	36.4	1	9.1	-	-	-	-

4.2.2.3.2 Qualitative Findings

Analyzing the codes emerged from the thematic analysis of the interviews, two themes were provided: benefits and suggestions. The main themes and subthemes are presented in Table 4.18 below. Each theme will be explained with examples from the interviews to illuminate participants' experiences about the effectiveness of the course in the second prototype.

Table 4. 18

Themes and Subthemes About Effectiveness in Prototype 2

Themes	Subthemes
Benefits	• Learning anytime and anywhere is possible due to mobility
	• Enabled autonomous learning
	• Enabled realization of using digital games as authentic learning sources
	• Prompted a way to reach students
	• Enabled the application of theory into practice
	• Provided information and know-how from the experts in their fields
	• Enriched pedagogical knowledge
Suggestions	• Target group of the mTPD course
	• Need for more time
	• Need for providing cooperation
	• Need for information about course load

4.2.2.3.2.1 Theme 1: Benefits of the mTPD course in prototype 2

This theme presents the benefits that participants think they gained from the mTPD course. There are seven subthemes under this theme: learning anytime and anywhere is possible due to mobility, enabled autonomous learning, enabled realization of using digital games as authentic learning sources, prompted a way to reach students, enabled the application of theory into practice, provided information and know-how from the experts in their fields, and enriched pedagogical knowledge. Each subtheme is explained below with examples from the interviews.

All seven interviewees remarked that they liked the course since it allowed for flexibility by eliminating the requirement of learning to happen at a particular time or place. No matter where they were, whether at their desks or somewhere like kitchen, they were able to access the content at their own pace. One participant reported that she was content with the fact that she didn't have to tie herself to a specific place or time when she wanted to study the course.

The advantage is that you can get up in the morning and look, or when you wake up at night and have something on your mind when you can't sleep. I mean, if it was face to face, I think it wouldn't be much different from that, so that was fine. In other words, if it was face to face, the lessons would be longer, so everyone would talk. In other words, it was clearer this way, I think it was better in terms of time and space. I like working at my own pace. (P18)

Avantajı sabah kalkıp bakabiliyorsun ya da gece kalkıp uykun tutmadığında aklında bir şey kaldığında. Yani yüz yüze olsaydı bence bundan çok da farkı olmazdı yani bu gayet iyiydi. Yani yüz yüze olsaydı dersler uzardı yani herkes konuşurdu falan. Yani böylesi daha net oldu, daha zamansal açıdan ve mekan açısından bence daha iyi oldu. Kendi hızımda çalışmam hoşuma gitti. (P18)

Two interviewees reported that the mTPD course enabled autonomous learning, which gave them the opportunity to take charge of their own learning. One interviewee said that she liked the fact that she was responsible for all the decisions concerned with her learning process during the course.

Since I like learning individually, let's say at your own pace, because I like the individual part, it works for me. I dwell on it as much as I want or I don't know, I skip some of them faster, but maybe everything will be explained longer in the class. In that respect, I think it is more advantageous. (P10)

Ben bireysel öğrenmeyi sevdiğim için, kendi hızında diyelim, hani bireysel kısmını sevdiğim için bir taraftan da yani işime geliyor. Onun üzerinde istediğim kadar duruyorum ya da işte ne bileyim bazılarını daha hızlı geçiyorum ama sınıfta belki de her şey çok uzun uzun anlatılacak. O açıdan da bunun daha avantajlı olduğunu düşünüyorum. (P10)

All seven interviewees reported that the mTPD course enabled realization of using digital games as authentic learning sources. One interviewee said that she was a veteran teacher and added that she was in the dark about the potential of digital games in language teaching but now she accepts the fact that every teacher needs such an education.

I have been an English teacher for 21 years. This year, for the first time, I have an idea and knowledge about how a digital game can be integrated into English learning. That's why I think everyone needs such an education. (P18)

Ben 21 yıllık İngilizce öğretmeniyim. Bu sene ilk kez bir dijital oyunun İngilizce öğrenimine nasıl entegre edilebileceği ile ilgili bir fikir sahibi oldum, bilgi sahibi oldum. O yüzden bence de herkesin böyle bir eğitime ihtiyacı var diye düşünüyorum. (P18)

Another interviewee stated that she changed her negative opinion about the potential of digital games in language teaching after implementing the method she learned in this course to her sister.

There were my cousins and friends who improved their English by playing computer games, and those who said that they improved their English just by playing video games. But I was like, how can somebody learn English from a computer game? But now I have a sister 1 year older than me and she wants to improve herself in English. I implemented the game to her practically while I was studying your course. I got good feedback from her too, I mean she said she learned some words and it worked. I can say positive things, it has opened up my horizon in this respect, it can really be learned. (P10)

Çevremde bilgisayar oyunu oynayıp İngilizcesini iyileştiren kuzenlerim, arkadaşlarım ve sadece bilgisayar oyunu oynayarak İngilizcemi geliştirdim diyenler vardı. Ama bana çok sey gelmiyordu, nasıl ya bilgisayar oyunundan İngilizce mi öğrenilir diye. Ama şu an ablam var benden 1 yaş büyük, o da İngilizce konusunda kendini geliştirmek istiyor. Eğitimdeki oyunu ona uygulamalı olarak sizle eğitimi alırken uyguladım. Ondan da iyi bir dönüt aldım, yani dedi ki bazı kelimeleri öğrendim etki sağladı dedi. Olumlu şeyler söyleyebilirim, bu açıdan ufkumu geliştirdi, gerçekten öğrenilebilir. (P10)

Six interviewees remarked that mTPD course prompted a new way to reach students. One interviewee stated that there are a lot of students in their class who are experts in gameplay, and they can build a connection with these students if they integrate games into their classes.

I never thought I could integrate a game like this, so it was a first for me as well. Such a plan was also a first for me. Since children are also very interested in this digital game part, I thought it was something that could affect more motivation. So it was a good experience. (P19)

Bir oyunu bu şekilde entegre edebileceğimi hiç düşünmemiştim, yani benim için de bir ilkti. Böyle bir tarz plan da benim için bir ilkti zaten. Çocuklar da böyle dijital oyun kısmına çok ilgili olduğu için daha fazla motivasyonu etkileyebilecek bir şey olduğunu düşündüm. O yüzden güzel bir deneyimdi. (P19)

Another teacher accepted the fact that learning a language constitutes a means of learning everything that is embodied in a language including culture or lifestyle. In this respect, she thought that digital game might be a means to attract students' attention in language classes.

I always believe that the language teachers are different from the other field teachers. With this study, I realized that we can teach even a video game. Teaching a new language shouldn't be a lesson because it is a lifestyle. I confirmed this idea with this course again. (P11)

Dil öğretmenlerinin diğer alan öğretmenlerinden farklı olduğuna her zaman inanmışımdır. Bu çalışma ile bir video oyunu bile öğretebileceğimizi anladım. Yeni bir dil öğretmek sadece bir ders olmamalı çünkü o aynı zamanda bir yaşam tarzı da. Bu fikrimi aldığım bu eğitimle yine doğruladım. (P11)

Four interviewees stated that mTPD course provided a link between theory and practice and it gave opportunities to implement theory in practical activities. One participant said that she was able to get a better understanding of the theoretical information given in the course after preparing a lesson plan.

I would definitely say take this course, because okay, the theory might weaken a little later, but something settles down because you prepare a lesson plan at the end, quite a few things settle down. So, thanks to this, I understood how to integrate not only games but also other things. That framework helped me a lot. (P12)

Kesinlikle bu dersi yapın alın derim çünkü yani tamam daha sonradan teori biraz zayıflayabiliyor ama sonunda bir ders planı yazdığın için bir şeyler oturuyor, bayağı bir şeyler oturuyor. Yani bunun sayesinde sadece oyunları değil başka şeyleri de nasıl entegre edeceğimi kafamda oturttum. O framework çok işime yaradı. (P12)

Three interviewees were content that mTPD course provided information and know-how from the experts in their fields. One participant (P18) stated the following about the expert: *"Your team was very good, I mean, on an international level and that was really good."* "Ekibiniz çok iyiydi, yani uluslararası çapta falan gerçekten çok güzeldi."

Interviewees especially made a mention of the content contributor who implemented DGELL in her own classroom and shared her experiences with the participants in the last unit.

It was great to see X's sample lesson plans, ask her questions, watch the video she introduced, and benefit from her own experiences. Because it was too vague for me until I got there. (P10)

X hocanın örnek ders planlarını görmek, ona soru sorabilmek ve onun tanıttığı videoyu izleyebilmek, kendisinin deneyimlerinden yararlanabilmek çok iyiydi. Çünkü oraya gelene kadar benim için çok soğuktu. (P10)

Six interviewees stated that they enriched their pedagogical knowledge by making connections to real-world applications of the course material. They reported that not only do they know about the core elements such as PCaRD, TPACK or ICCE, which are necessary for an effective implementation of digital games to language learning, but also they know how to prepare a lesson by taking consideration of these elements.

I had known nothing before and at least now I know how to integrate a game in my lesson. That's why, even as it stands now, I think it's obviously quite useful. (P15)

Ben hiçbir şey bilmiyordum ve en azından şu anda bir oyunu nasıl dahil edebileceğimi biliyorum yani dersime. O yüzden şu haliyle bile bence gayet faydalı olduğunu düşündüm açıkçası. (P15)

4.2.2.3.2.2 Theme 2: Suggestions for effectiveness in prototype 2

This theme identifies the suggestions that the interviewees shared to improve the effectiveness of the mTPD course. There are three subthemes: target group of the mTPD course, need for more time and need for providing cooperation. Each subtheme is explained with examples.

Two interviewees identified the characteristics of the target group of this mTPD course. One participant stated that language teachers working in state school are required to abide with the curriculum pacing of their schools and they don't have the flexibility to create alternative teaching methods in their classrooms. Because of this fact, they thought that language teachers working in private schools could benefit from this program more than the teachers in state schools.

Since I work at a state university, I am thinking about it a bit, we have a curriculum that does not give us much freedom. So I'm not sure if it will work for everyone. That's why I didn't implement the lesson because there is a program that we need to catch, that we must run over. So I'm not really sure if everyone should take it. I mean, there is more freedom especially in private schools. It was the same when I used to work there. They can also do more experimental things, so I think those who are interested or have a lot of time should try and learn about this subject. (P9)

Devlet üniversitesinde çalıştığım için, yani onu biraz düşünüyorum, çok özgürlük vermeyen bir müfredat işleniyor. O yüzden herkesin işine yarayabilecek mi emin değilim. İşte ben de dersi o yüzden uygulamadım çünkü yetiştirmemiz gereken, koşarak gitmemiz gereken bir program var. O yüzden gerçekten herkes almalı mı ondan emin değilim. Yani açıkçası özellikle özellerde çalışanların daha bir özgürlük alanı var. Ben de çalışırken öyleydi. Daha deneysel şeyler de yapabiliyoruz o yüzden ilgisi olanlar ya da çok vakti olanlar falan denemeli bence ve öğrenmeli bu konuyu. (P9)

Another interviewee remarked that she got the most out of this course since she was well-organized and dedicated.

So you know, I didn't study this course at random. I mean, I found it very productive since I had my coffee or tea and my cigarette and studied highlighting with colored pencils when my mind was fresh. And I got my answers from everything. (P12)

Bildiğin böyle araya sıkıştırmak için yapmadım bu uygulamayı. Yani bildiğin kafam dinçken kahvemi çayımı alıp, sigaramı alıp renkli kalemlerle çizerek çalıştığım için ben çok verimli buldum, cevaplarımı da aldım her şeyden. (P12)

Two interviewees stated that they had problems with time management since the training took place in the middle of the school term. Because of this fact, they suggested that the training could be held in mid-term breaks and more time can be given to complete the course

More different results could have been provided if there had been more time. It is a work that requires full commitment on top of my own burden. I mean, you have to do a lot of tasks, you don't only listen and pass on or read and pass on. In that sense, it was really time consuming for me. Like I said, it would have been much easier for me if it had been in a different period when there were no classes. (P9)

Daha çok vakit olsa çok daha farklı bir sonuçlar çıkabilirdi. Kendi yükümün üzerine bir de böyle dolu dolu bir katılım gerektiren bir çalışma. Yani dinle geç, oku geç değil de bir sürü task yapmanız gerekiyor. O anlamda gerçekten çok vakit alıcıydı benim için. Dediğim gibi derslerin olmadığı farklı bir dönemde olsaydı çok daha kolay ilerlerdi benim için. (P9)

All seven interviewees highlighted the need for providing cooperation as well as interaction in the mTPD course. The drawbacks of the course that the teachers mentioned most in terms of cooperation was the lack of opportunity to interact with other teachers. As it is known, discussion forums were replaced in this prototype with 'ask me a question' sections in each unit. In these sections, the participants were asked to share their questions about the subjects they wondered, but this section was rarely used by the participants. Teachers said that they expected to see a discussion platform

that they could use when they needed help on any subject or when they wanted to learn from others' ideas.

There were places where we made reflections, I loved them. But I thought maybe if there was a discussion form or something, it would be more effective. For example, if making a comment is also a part of the evaluation. So, frankly, I like to learn from what others have written in that part. You know, the situation where they also get something from their knowledge. That's why I think discussion forums can be effective. (13)

Reflection yaptığımız yerler vardı ya, onları ben sevdim. Ama orada belki tartışma formu falan olsa daha etkili olabilir mi acaba diye düşündüm. Hani bir tane yorum yapmak da değerlendirmenin bir parçası olsa mesela. Yani ben açıkçası o kısımda başkalarının da yazdıklarından öğrenme durumunu seviyorum. Hani onların da bilgilerinden bir şeyler edinme durumunu. O yüzden etkili olabileceğini düşünüyorum tartışma forumlarının. (P13)

Another interviewee suggested using a grading criterion to increase participation into the discussion forum activities.

Even master's or doctoral students fulfill some of their duties with a focus on grades, so if you had said that they were supposed to share at least one post to complete the course, then maybe it would be more useful. (P15)

Yüksek lisans ya da doktora öğrencileri bile not odaklı olarak bazı görevlerini yerine getiriyorlar, yani burada da programı tamamlamak için en az bir paylaşım yapmanız gerekiyor deseydiniz belki o zaman daha çok işe yarayabilirdi. (P15)

4.2.3 Research Question 2

Participants in prototype 2 completed the questionnaire before and after the mTPD course. There were 19 items to evaluate their perceptions. Participants expressed their opinions on a five-point scale, from 'strongly agree (5), to strongly disagree (1)'. Descriptive results of the perception questionnaire were given in Table 4.19.

Table 4. 19

Descriptive Results of the Perception Questionnaire in Prototype 2

	Pretest			Posttest		
	n	M	SD	n	M	SD
1. Digital games enhance the quality of my job.	11	4.36	0.51	11	4.91	0.30
2. Digital games in my job increase my productivity.	11	3.27	0.91	11	4.45	0.83
3. Digital games enhance my effectiveness in my job.	11	3.45	0.82	11	4.18	0.87
4. I find digital games to be useful in my job.	11	3.82	0.60	11	4.55	0.52
5. Using digital games makes teaching easy.	11	3.45	0.82	11	3.55	1.04
6. I know how to use digital games in classroom setting.	11	2.18	1.25	11	4.45	0.52
7. I have the necessary skills to use digital games in a classroom setting.	11	3.64	0.67	11	4.18	0.60
8. I have used digital games before in classroom.	11	2.00	1.41	11	2.00	1.00
9. I have experience with the use of digital games in the classroom.	11	1.91	1.30	11	2.09	0.94
10. Digital games offer opportunities to experiment with knowledge.	11	3.45	0.93	11	4.36	0.51
11. Digital games offer opportunities to take control over the learning process.	11	3.55	0.93	11	4.45	0.52
12. Digital games offer opportunities to experience things you learn about.	11	4.00	0.63	11	4.64	0.51
13. Digital games offer opportunities to stimulate transfer between various subjects.	11	3.64	0.82	11	4.55	0.52
14. Digital games offer opportunities to think critically.	11	4.00	0.45	11	4.36	0.51
15.Digital games offer opportunities to motivate students.	11	4.73	0.47	11	4.73	0.65
16. Digital games fit the curriculum.	11	3.36	0.81	11	3.45	1.13
17. It is clear how digital games can be used to fit the curriculum.	11	2.82	0.98	11	4.00	1.00
18. I am planning to use digital games in the classroom.	11	2.82	0.98	11	4.36	0.81
19. In the future, I intend to use digital games in the classroom.	11	4.00	0.78	11	4.55	0.52

Using Digital Games in Teaching Questionnaire is composed of six constructs. These are usefulness (items between 1-5), ease of use (items 6-7), experience (items 8-9), learning opportunities (items between 10-15), curriculum relatedness (items 16-17) and behavioral intention (items 18-19). A paired samples t-test was conducted to determine whether there was a significant change in the perceptions of the participants regarding these constructs before and after the mTPD course in prototype 2 (Table 4.20). In order to avoid inflated Type 1 error, the *p*-value was adjusted using Bonferroni correction.

Table 4. 20

Results of the Paired Samples T Test in Prototype 2 Examining Participants'
Perceptions About Digital Games

	Before		After				
	M	SD	M	SD	t(10)	p	Cohen's d
Usefulness	18.36	3.04	21.64	3.04	2.92	0.015	0.88
Ease of use	5.83	1.54	8.64	1.03	4.95	0.001*	1.49
Experience	3.91	2.70	4.09	1.92	0.17	0.866	0.05
Learning Opportunities	23.36	2.80	27.09	2.55	2.98	0.014	0.90
Curriculum relatedness	6.18	1.54	7.45	1.81	1.85	0.094	0.56
Behavioral intention	7.82	1.72	8.91	1.30	1.57	0.147	0.47

Note: Mean parameter values for each of the analyses are shown for the participants in prototype 2 (*n* = 11), as well as the results of *t* tests comparing the scores before the mTPD course and after the mTPD course. An increase in the mean scores means an increase in agreement.

p value was adjusted for multiple comparisons with Bonferroni.

* *p* < .008

Results of the analysis indicated one significant change in the perceptions of the participants regarding these constructs before and after the mTPD course. Items related to 'ease of use' construct were asked to understand if participants' perceptions about their skills to use digital games in their classrooms changed after the mTPD course. There was a significant change in participants' perceptions about the ease of use of digital games in teaching before (M = 5.83, SD = 1.54) and after (M = 8.64, SD = 1.03) the course $t(10) = 4.95$, $p = 0.001$. The change in the other constructs were found to be insignificant according to the analysis.

4.2.4 Research Question 3

The third research question aimed to investigate how much the mTPD course on DGELL contributed to participants' knowledge on DGELL in theory and practice. To this end, the research question was investigated using two different data collection techniques, and the same procedure was followed as in prototype 1. First, an achievement test was given to the participants before and after the mTPD course to see how the mTPD course affected their theoretical knowledge on DGELL. Second, participants were asked to prepare a lesson plan on DGELL to understand if they were able to apply this knowledge acquired from the mTPD course in a lesson plan. By using the lesson plan assessment, the researcher was able to investigate if participants were able to apply this new approach by using their pedagogical content knowledge and not just recite the theory behind it.

The achievement tests were completed by 11 participants. A dependent samples T-test was conducted to evaluate whether participants' achievement test scores changed significantly after the mTPD course (Table 4.21). The results indicated a significant change in the pretest, (M = 8.45, SD = 3.75) and in posttest (M = 16.55, SD = 2.58), $t(10) = 4.68$, $p = 0.001$. We can conclude that participants' knowledge about DGELL increased significantly after taking the mTPD course.

Table 4. 21

Results of the Paired Samples T-Test of Achievement in Prototype 2

	Before		After				
	M	SD	M	SD	t(10)	p	Cohen's d
Achievement	8.45	3.751	16.55	2.583	4.679	0.001*	1.411

Note: Mean parameter values for pretest and posttest achievement scores are shown for the participants in prototype 2 ($n = 11$), as well as the results of t tests comparing the achievement test scores before the mTPD course and after the mTPD course. Maximum score participants can get from the achievement test is 20.

* $p < .05$

At the end of unit 3 in the mTPD course, participants were expected to create a lesson plan which was supposed to include multiple aspects of their pedagogical content knowledge on DGELL. Assessing participants' lesson plans, the researcher followed the same procedure as in the first prototype. Nine participants submitted their lesson plans and these lesson plans were evaluated with a holistic rubric (Appendix E). The rubric was one dimensional and it assessed participants' overall achievement of the task. The criterion of the rubric was to use PCaRD model while integrating a digital game into their teaching and develop pedagogical activities in each phase of PCaRD model that is in congruent with the DGELL approach. As can be seen in Table 4.22, 67% of the participants (n=6) were able to get a full score and they were able to demonstrate a complete understanding of the DGELL and use all the phases of PCaRD model consistently. 11% of the participants (n=1) showed a considerable understanding of the subject matter in practice. 11% of the participants (n=1) executed the components of PCaRD model in their lesson plans partially and they developed few activities relevant to the phases of the lesson. 11% of the participants (n=1) got the lowest score (1) because s/he didn't include the components of PCaRD model in

her lesson plan and s/he developed the activities with limited understanding of DGELL.

Table 4. 22

Lesson Plan Assessment Scores of Participants in Prototype 2

Criteria	n	%	Score
1. Lesson plan demonstrates complete understanding and execution of Digital Game-Enhanced Language Learning. It contains all components of PCaRD model, and they are accurately implemented throughout the lesson plan.	6	67%	4 (80-100%)
2. Lesson plan demonstrates considerable understanding and execution of Digital Game-Enhanced Language Learning. At least 3 components of PCaRD model are applied but may exhibit inconsistency in terms of balance in developing the phases of the model.	1	11%	3 (60-79%)
3. Lesson plan demonstrates some understanding and execution of Digital Game-Enhanced Language Learning. The components of PCaRD model are faintly stated, and the lesson plan is inconsistent in terms of balance in developing the phases of model.	1	11%	2 (40-59%)
4. Lesson plan demonstrates limited understanding and execution of Digital Game-Enhanced Language Learning. The components of PCaRD model are not stated, and the lesson plan is simplistic, unoriginal, and/or not is unbalanced in developing the phases of the model.	1	11%	1 (1-39%)

Note: Nine participants submitted their lesson plans.

4.3 Final Product

4.3.1 Description of the Participants in Final Product

Participants in the final product implementation were 25 EFL instructors who were working at the School of Foreign Languages at Zonguldak Bulent Ecevit University. 80% of the participants (n=20) were female and 20% of them were male (n=5). Regarding their experience, 64% of the participants (n=16) had 16 and more years of

teaching experience while 36% of the participants (n=9) had 11-15 years of experience. 40% of the participants (n=10) had a graduate degree, while 60% of the instructors (n=15) had an undergraduate degree.

Participants were asked to select their ability to use technological devices. The options included basic, moderate, advanced, and expert. As can be seen in Figure 4.9, 44% of the participants (n=11) indicated their skills were basic in using technological devices, while 40% of the participants (n=10) indicated they were moderate users of technology. 8% of the participants (n=2) identified themselves as advanced users and 8% of them (n=2) as expert users.
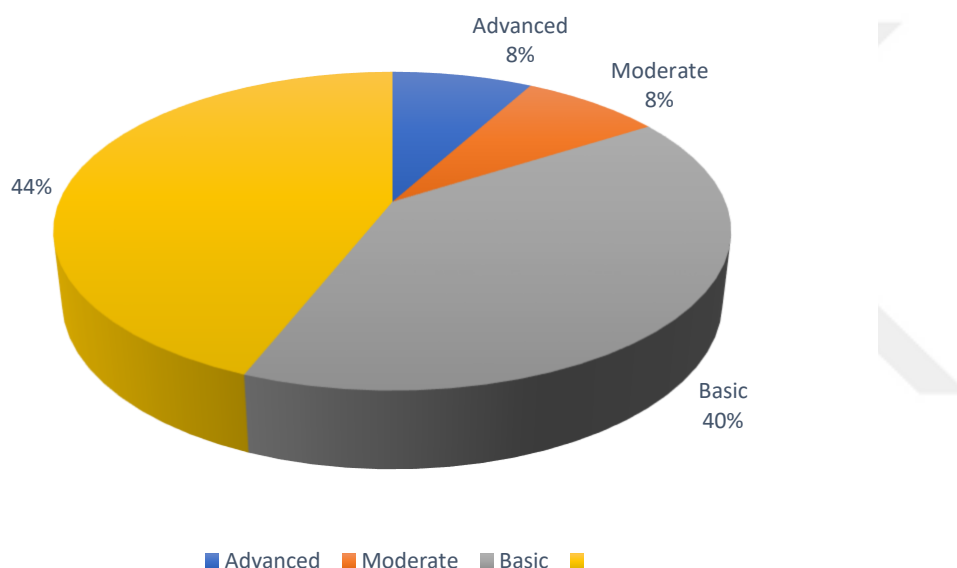
Figure 4. 9. Participants' Level of Ability to Use Technological Devices in Final Product.

Participants were asked how often they were using technology in teaching activities (Figure 4.10). 32% of the instructors (n=8) indicated they always integrated technology in their classrooms and 24% of the instructors (n=6) said that they often used technology in their teaching activities. 36% of the instructors (n=9) indicated that they sometimes used technology in their teaching. 8% of the participants (n=2) stated that they barely used technology in their teaching activities. The participants were also asked how often they were using digital games for teaching in class. 20% of the

instructors (n=5) indicated that they were using digital games 1-2 times a week in their classes, while 80% of the instructors (n=20) indicated they never used digital games in their teaching.
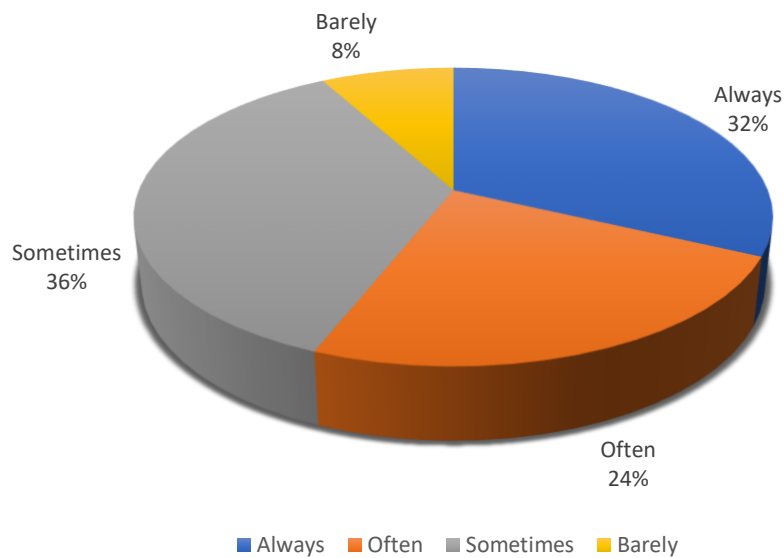
Figure 4. 10. Distribution of Participants Using Technology in Their Teaching in Final Product.

Lastly, participants were asked if they had ever participated in any kind of professional development activities about using digital games in language learning. 96% of the instructors (n=24) indicated that they never participated a professional development activity about using a digital game in language learning before, while 9% of the participants (n=1) indicated they participated in a professional development activity about digital games in language learning before.

4.3.2 Research Question 1

The same procedure was followed as in the first and second prototype while reporting the findings of the final product. The quantitative data obtained from the course evaluation questionnaire and the qualitative data obtained from the interviews were analyzed to investigate the perceptions of participants about the content, usability, and effectiveness of the mTPD course on DGELL. The following sections will explain the results of these findings.

4.3.2.1 Perceptions About the Content of the mTPD Course

4.3.2.1.1 Quantitative Findings

Participants (n=25) were asked how much of the content they completed in the mTPD course(Figure 4.11). 84% of the participants (n=21) stated that they completed all the content in the mTPD course, while 16% of the participants (n=4) stated that they skipped some content. It was found out that 88% of the participants (n=22) participated in the discussion forum activities. Achievement tests were completed by 96% of the participants (n=24). All participants stated that they completed all the other parts in the course including warm-up tasks, video lectures, written lectures, lecture tasks and try-out tasks.
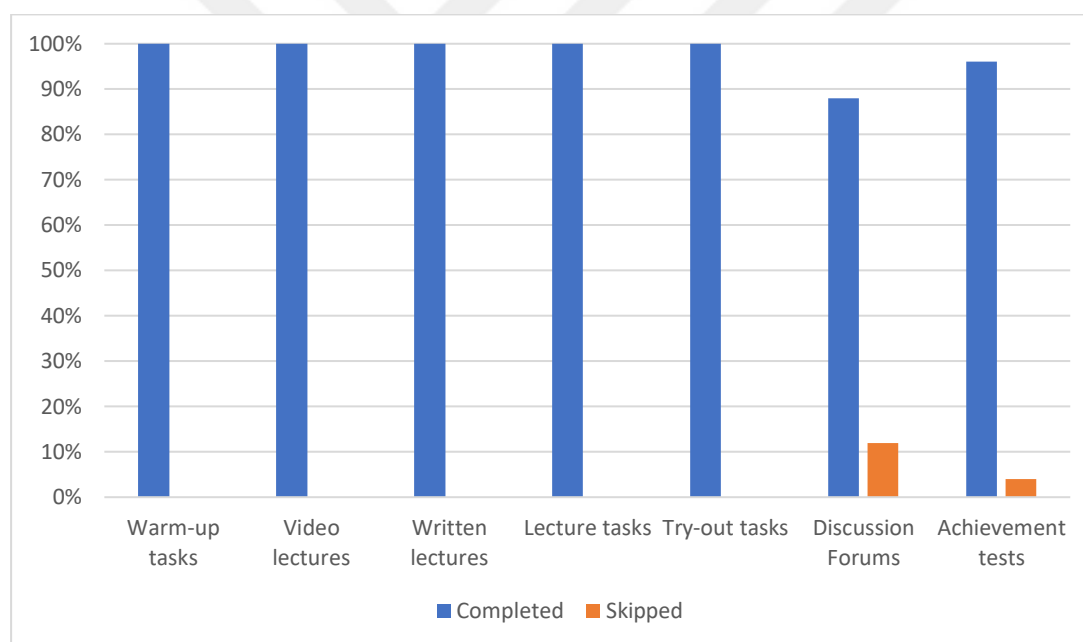
Figure 4. 11. Distribution of Course Content Completed by the Participants in Final Product.

Participants (n=25) were asked to decide how important each content of the mTPD course was by using 5-point scale from 'very important' to 'not at all important'. Results of this question can be seen in Table 4.23. 96% of the participants (n=24) agreed on the importance of warm-up tasks, while 4% of the participants (n=1) thought warm-up tasks were not important. All participants (n=25) agreed on the importance

of video lectures. 96% of the participants (n=24) indicated that written lecture tasks were important, while 4% of the participants (n=1) stated that they were not sure. 96% of the participants (n=24) indicated that try-out tasks were important, while 4% of the participants (n=1) stated that try-out tasks were not important. 60% of the participants (n=15) stated that they found discussion forums important, while 32% of the participants (n=8) were not sure about the importance of discussion forums and 8% of the participants (n=2) found them not important. Lastly, 92% of the participants (n=23) found achievement tests important, while 8% of the participants (n=2) was not sure about the importance of achievement tests in the course.

Table 4. 23

Results of the Course Evaluation Questionnaire About the Importance of Content in Final Product

	Very important		Important		Not sure		Slightly important		Not important	
	n	%	n	%	n	%	n	%	n	%
Warm-up tasks	12	48	12	48	1	4	-	-	-	-
Video lectures	18	72	7	28	-	-	-	-	-	-
Written lectures	12	48	12	48	1	4	-	-	-	-
Lecture tasks	12	48	12	48	1	4	-	-	-	-
Try-out task	17	68	7	28	-	-	-	-	1	4
Discussion forums	3	12	12	48	8	32	-	-	2	8
Achievement tests	8	32	15	60	2	8	-	-	-	-

Perceptions of the participants about the content of the mTPD course were investigated on a five-point scale, 'strongly agree to strongly disagree'. Results of this part of the questionnaire can be seen in Table 4.24. All participants stated that the content was clear, and the content of the course helped them learn how to use digital games in their teaching using Digital Game-Enhanced Language. 96% of the participants (n=24)

indicated that topics of the content followed a logical order, while 4% of the participants (n=1) strongly disagreed with this statement. 92% of the participants (n=23) thought that the content of the warm-up tasks was in congruent with the content taught; however, 8% of the participants (n=2) were not sure about the suitability of warm-up tasks to the content taught. All participants (n=25) agreed with the statements that video lectures and written lectures helped them learn the subjects and rubrics in each activity were sufficient. 92% of the participants (n=23) stated that try-out tasks reinforced their learning and 8% of the participants (n=2) indicated that they were not sure whether try-out tasks reinforced their learning or not. 80% of the instructors (n=20) stated that discussion forums helped them learn other people's opinions about the subject matter, while 16% of the participants (n=4) approached this statement cautiously by choosing the 'not sure' option and 4% of the participants (n=1) indicated that they didn't agree with this statement. All participants (n=25) stated that achievement tests were good enough to assess their learning.

Table 4. 24

Results of the Course Evaluation Questionnaire About the Quality of Content in Final Product

	Completely agree		Agree		Not sure		Disagree		Completely disagree	
	n	%	n	%	n	%	n	%	n	%
Content was clear.	21	84	4	16	-	-	-	-	-	-
Content followed a logical order.	19	76	5	20	-	-	-	-	1	4
Content of the course helped me learn DGELL.	15	60	10	40	-	-	-	-	-	-
Content of warm-up tasks were in congruent with the content taught.	20	80	3	12	2	8	-	-	-	-
Video lectures helped me learn the subjects.	17	68	8	32	-	-	-	-	-	-
Written lectures helped me learn the subjects.	16	64	9	36	-	-	-	-	-	-
Rubrics were sufficient.	18	72	7	28	-	-	-	-	-	-
Try-out tasks reinforced my learning.	15	60	8	32	2	8	-	-	-	-
Discussion forums helped me learn other people's opinions about the subject.	13	52	7	28	4	16	1	4	-	-
Achievement tests were good enough to assess my learning.	17	68	8	32	-	-	-	-	-	-

4.3.2.1.2 Qualitative Findings

Interviews were conducted with 9 instructors to provide in-depth data about participants' perceptions regarding the content of the mTPD course. Thematic analysis was used to interpret the data and two themes were provided from the transcripts: satisfaction and suggestions. The main themes and subthemes are presented in Table 4.25. Each theme will be explained further with examples from interview transcripts to provide a better understanding.

Table 4. 25

Themes and Subthemes About Content in Final Product

Themes	Subthemes
Satisfaction	• Fulfilled my expectations
	• Satisfaction with content sequencing
	• Satisfaction with the depth of content
	• Satisfaction with multiple content types and formats
	• Satisfaction with clear and effective instructions
	• Satisfaction with warm-up tasks
	• Satisfaction with the videos
	• Satisfaction with check your progress part
Suggestions	• Need for more input while teaching new content

4.3.2.1.2.1 Theme 1: Satisfaction about the content of final product

This theme represents the findings about how satisfied language teachers were regarding the content of the mTPD course in the final product. There were nine subthemes under the main theme: fulfilled my expectations, satisfaction with content sequencing, satisfaction with the depth of content, satisfaction with multiple content types and formats, satisfaction with clear and effective instructions, satisfaction with warm-up tasks, satisfaction with the videos and satisfaction with check your progress part.

Eight interviewees reported that the mTPD course fulfilled their expectations. They said that their expectation was to learn practical methods that they could use in the classroom by using the information they learned in the mTPD course. After the training, they went beyond this and most of them created a lesson plan. One participant supported this statement and added that this training would meet the need and could be used as a professional development training for other teachers.

This training fills that need, obviously. I don't know what more could be done. I don't know if this is 1.0 or what version you are in, but this is how it will develop, there will be additions and deletions. I mean, I can't say anything about them, but I got what I wanted. When you ask me now, I know what ICCE stands for, and I know its meaning... I prepared a lesson plan, I designed it as much as I can. All friends who have finished the lesson plan have a lesson plan in their hands. If everyone has a lesson plan, isn't this training enough? (29)

Bu eğitim bu ihtiyacı karşılar, net yani. Daha fazlası ne olabilir bilemiyorum. Bu da sonuçta 1.0 mı yoksa kaçıncı sürümündesin bilmiyorum ama bu da böyle gelişecek, eklemeler çıkarmalar falan olacak. Yani onlara bir şey diyemem ama ben almak istediğim şeyi aldım mı aldım. Şu an bana sorduğunda isim olarak ICCE açılımı ne olduğunu, onların anlamını biliyorum... Ders planı hazırladım, tasarladım eksi ile gediği ile. Ders planını bitiren arkadaşların hepsinin elinde bir ders planı var. Herkesin elinde bir ders planı varsa bu eğitim yeterli olmuş olmuyor mu yani. (P29)

Six interviewees shared their satisfaction about the sequence of the content. They stated that as they moved through the end of the course, the content was sequenced from theory to practice, or from easy to more complex with the goal of extending teachers' pedagogical content knowledge. One participant shared her satisfaction talking about the order of course content and reporting that the content was organized well.

What could I expect from it, let's look at the content, it is there, you will learn DGELL in the course. There is output in the lesson, you will prepare a lesson plan, the feedback will be interactive. It's obvious what it contains, I learned it. At the end of the training, did I produce something? I did, did I learn? I did. I mean, the course is of good quality in terms of competency. (P35)

Benim bundan isteyim ne olabilir, bakalım içeriğine, yazıyor zaten derste DGELL öğreneceksiniz. Derste yani output da var, bir tane ders planı hazırlayacaksınız, dönüt olacak interaktif olacak. Zaten neyi içerdiği belli, ben bunu aldım. Eğitimin sonunda bir şey ürettim mi, ürettim, öğrendim mi öğrendim. Ders yeterlilik anlamında kaliteli yani. (P35)

Eight interviewees reported their satisfaction about the depth of content. They stated that a wide range of related subjects were focused on, amplified, and explored with comprehensive and detailed content. One participant stated that the videos she watched were very clear and she saved time by watching these videos. She also liked the fact that she wasn't obliged to read long articles.

The videos I watched were short and clear, so I didn't have to do long readings. The notes I took while watching carried me to the next thing, for example, there were small assessment parts, for example, the notes I took from there saved me, frankly, I felt sufficient in many things. (P28)

İzlediğim videolar kısa ve netti, yani böyle hani çok uzun okumalar yapmam gerekmedi mesela. İzlerken aldığım notlar beni sonra şeye taşıdı, mesela küçük küçük değerlendirme kısımları vardı, oralarda mesela oradan aldığım notlar beni götürdü açıkçası, kendimi yeterli hissettim birçok şeyde. (P28)

Three interviewees talked about their satisfaction about multiple content types and formats in the mTPD course. They thought that the instructional materials were varied, and this gave them the opportunity to keep their attention on the course without losing their concentration. One participant mentioned this variety by giving examples from the warm-up activities, videos and articles.

The variety was very good. Also, even in warm up activities, one activity was true and false, while the other was drag-and-drop activities. All kinds of that. While there was a video in the module where the subject was told, there was a reading article in the other. In that sense, I really liked the preparation of the flow of the content. (P43)

Çeşitlilik çok güzeldi. Bir de warm up aktivitelerinde bile bir tanesinde doğru yanlış varken diğerinde sürükle-bırak aktiviteleri vardı. Her türlü yani. Konunun

anlatıldığı yerlerde video varken diğerinde okuma parçası vardı. O anlamda akış içeriğin hazırlanmasını çok beğendim. (P43)

Two interviewees reported their satisfaction with clear and effective instructions given during the program. One participant stated that she knew what was expected from them and what to do in the tasks by means of clear instructions and the flexible structure of the course.

I never thought that I was lacking information about the training I received from you here. From the beginning, I never got into a panic about what I would do in different situations or where I would go. There was no situation where I panicked, it was transparent. I mean, all the stages from the beginning to the end were specified. We knew what we were going to experience next. The program and the stages we would follow were clear, which frankly put me at ease. I knew what I had to go through; I was able to adjust my hours according to myself. So it was very flexible and nice. (P29)

Buradaki sizden aldığım eğitimle ilgili bilgilendirme eksikliği hiç hissetmedim. Başından beri acaba şöyle miydi, böyle miydi, burayı mı yapacağız, nereye gireceğiz gibi bir panik olayına hiç girmedim. Burada paniklediğim hiçbir durum olmadı, şeffaftı. Yani başından sonuna kadar bütün aşamaları belirtilmişti. Bir sonraki aşamada ne yaşayacağımızı biliyorduk. En başta paylaşılan program ve takip edeceğimiz aşamalar belliydi, bu beni çok rahatlattı açıkçası. Önümde kat etmem gereken ne var onu bildim, saatlerimi kendime göre ayarlayabildim. O yüzden gayet esnek ve güzeldi. (P29)

Six interviewees reported that they were satisfied with the warm-up tasks in the course. One participant stated that the content in warm-up tasks were well-thought, and she was able to predict what would be taught in the upcoming content because of the connection of the warm-up tasks to the new information to be taught in that module.

I liked the warmup activities because you gave me what to do in this unit without being noticed, and you also gave the objectives at the beginning. Warmup activities became more memorable for me. While I was watching the videos and activities I did, I didn't have any question in my mind about what would happen next, I liked it. (P39)

Warmup aktivitelerini sevdim çünkü fark ettirmeden bu ünitede ne yapacağımı vermişsin ve objektifleri de ayrıca yazmışsın başına. Warmup aktiviteleri daha fazla akılda kalıcı oldu benim için. Yaptığım aktivitelerde ve videoları seyrederken aklımda tam bir soru işareti yoktu ne olacak şimdi diye, onu beğendim. (P39)

All interviewees reported their satisfaction, as well as their dissatisfaction about the videos. Regarding the positive perceptions about the videos, one participant stated that videos were time saving and they helped her understand the main idea of the subjects.

I liked that the lectures were given with video. Frankly, I did not have the opportunity to sit down and read the articles in detail, partly due to my current situation. That's why the videos are given as to the point. You can watch those videos right away and get general idea about the subject, and then, when you have time, you can look at other resources in more detail. In that sense, I liked it very much, I liked the video lectures. (P35)

Konu anlatımlarının video ile anlatılması hoşuma gitti. Açıkçası biraz da benim şu andaki durumumdan kaynaklı oturup çok detaylı olarak makale okuma fırsatım olmadı. O yüzden de to the point şeklinde verilmiş videolar. O videoları hemen böyle izleyip konuyla ilgili genel bilgi edinip, ondan sonra da vaktiniz olduğunda daha detaylı olarak diğer kaynaklara da bakabilirsiniz. O anlamda çok hoşuma gitti benim, video anlatımlarını beğendim. (P35)

On the other hand, interviewees also mentioned their dissatisfaction about the videos. One participant reported her dissatisfaction about the difficulty to follow the slides, which eventually had her confuse the instructor's verbal message.

In the video lectures, I think it was the professor from X, I did not like them very much. Giving their lectures in pinpoints (like X's) instead of an animated presentation is convenient for the mobile learner. I wanted to take screenshots without using a notebook, but I felt like I had to take notes for some important points in their presentation. (P32)

Videolu anlatımlarda sanıyorum X'li hocamızınkiydi, onu çok beğenmedim. Animasyonlu sunum yerine, anlattıklarının pinpointler şeklinde verilmesi (X'nınki gibi) mobil öğrenen için kolaylık. Çünkü ben not defteri de kullanmadan ekran görüntüsü almak istedim ancak X hocanınkisinde bazı önemli yerler için not tutmak zorundaymışım gibi hissettim. (P32)

Another interviewee reported that she wasn't satisfied with some videos because she found the instructor's tone of voice too flat, which eventually got her bored.

I had a very hard time listening, because the thing is very important to me, I mean, the tone of voice when speaking. Maybe it's about me, but I was bored, I can say that while listening to it, I was very bored. (P23)

Çok zorlandım dinlerken yani çünkü benim için şey çok önemli, yani konuşurken ses tonu. Belki o benimle ilgili olabilir ama sıkıldım yani dinlerken, çok sıkıldım öyle söyleyebilirim. (P23)

Seven interviewees shared their satisfaction with check your progress part. Check your progress part was given at the end of each unit and it included two parts, an achievement test and a rate your own learning part. Interviewees remarked that questions in the achievement tests were able to measure their attainments and they didn't see anything irrelevant in this section. One interviewee stated that she was able to assess her own performance answering the questions in those parts.

The assessment questions at the end of the units were sufficient for the assessment of the subjects and I think they were oriented towards the essence of the subject. When I answered those questions, I was able to test myself. Yes, there was this, okay, I could say that I saw it over there. They were completely relevant to the content and asked in the same direction, and I think they were enough. I mean, more than that, I don't know, I think it could be tiring and boring. (P26)

Ünitelerin sonundaki değerlendirme soruları konuların değerlendirilmesi açısından bence yeterliydi ve bence konunun özüne yönelikti. O soruları cevapladığım zaman kendimi de test edebiliyordum ben. Evet bu vardı, tamam ben bunu şurada görmüştüm diyebiliyordum. Tamamen içerikle bağlantılı ve aynı doğrultuda sorulan sorulardı ve bence yeterliydi. Yani ondan daha fazlası ne bileyim yorucu ve sıkıcı olabilirdi diye düşünüyorum. (P26)

4.3.2.1.2.2 Theme 2: Suggestions about the content of final product

There was one significant suggestion received from the interviewees regarding the content of the final product. Three interviewees highlighted the need for more input

while teaching new content. When asked what content they found insufficient, one interviewee said that she learns by reading best and she expected to see more reading sources, while another participant expected to see more sample activities in the lesson planning task.

If I was the designer of this course, although the videos are very explanatory, clear and short, I think that reading is more effective according to my learning style, so I remember it more easily when I read. Maybe I would have developed it with options because it can be the opposite of me, I mean, people can learn by listening, so I think I can leave this option to the learner. (P43)

Bu dersin tasarımcısı ben olsam, her ne kadar videolar çok açıklayıcı, net ve kısa olsa da bence benim öğrenme tarzıma göre okumak daha etkili olduğu için okuduğumda daha çok aklımda kalıyor. Belki hani opsiyonlu geliştirirdim çünkü benim tersim de olabilir yani insanlar dinleyerek de öğreniliyor olabilir yani bu opsiyonu öğrenciye bırakabilirim diye düşünüyorum. (P43)

4.3.2.2 Perceptions About the Usability of the mTPD Course

4.3.2.2.1 Quantitative Findings

Participants were asked how much time in average they spent for each unit in the mTPD course. 8% of the participants (n=2) stated that they spent less than 30 minutes in each unit. 52% of the participants (n=13) spent between 30 mins and 1 hour for each unit in the mTPD course and 28% of the participants (n=7) spent between 1 - 2 hours for each unit in the course. 12% of the participants (n=3) spent more than 2 hours for each unit (Figure 4.12).
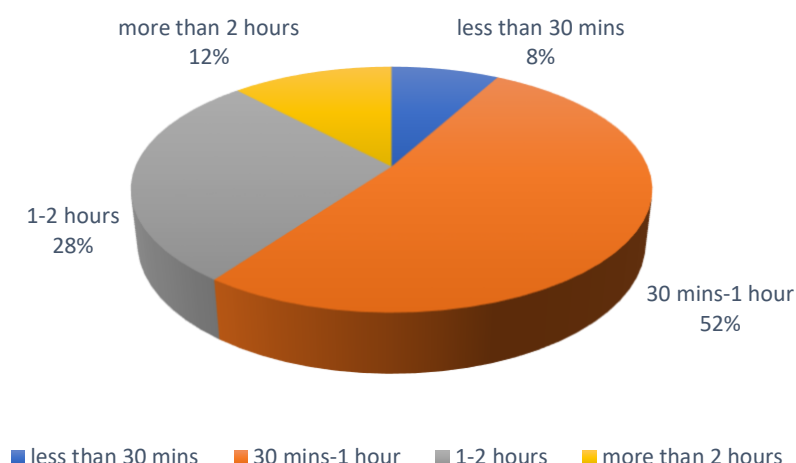
Figure 4. 12. Time Spent on Each Unit in the mTPD Course in Final Product.

Participants were asked in which locations they used the mTPD course more often; their home, workplace or mobile. 92% of the participants (n=23) stated that they were mostly at home while 8% of the participants (n=2) stated that they were mobile while using the mTPD course. 32% of the participants (n=8) stated that in addition to studying home, they also studied the course at their office or when they were mobile.

Participants (n=25) were asked six questions to assess how well they were able to use different functions of the mTPD course. As can be seen in Table 4.26, 84% of the participants (n=21) expressed positive opinions about the easiness of the course interface, while 12% of the participants (n=3) were hesitant and 4% of the participants (n=1) thought the course interface wasn't easy to use. All participants (n=25) stated that they were able to open and watch the videos, do and share their assignments on Schoology app without any problem, and log in the course easily. Participants (n=25) also thought that all links were working well in the modules. 84% of the participants (n=21) agreed that they could communicate with the other learners in discussion forums, while 16% of the participants (n=4) were not sure if they were able to communicate with their peers in the discussion forums easily.

Table 4. 26

Results of the Course Evaluation Questionnaire About Usability in Final Product

	Completely agree		Agree		Not sure		Disagree		Completely disagree	
	n	%	n	%	n	%	n	%	n	%
Course interface was easy to use.	15	60	6	24	3	12	1	4	-	-
I was able to open and watch the videos easily.	21	84	4	16	-	-	-	-	-	-
I was able to log in the Schoology course easily.	23	92	2	8	-	-	-	-	-	-
All links were working well.	23	92	2	8	-	-	-	-	-	-
I was able to do and share my assignments on Schoology app without any problem.	23	92	2	8	-	-	-	-	-	-
I was able to communicate with other learners in discussion forums easily.	18	72	3	12	4	16	-	-	-	-

4.3.2.2.2 Qualitative Findings

Challenges and suggestions were two themes that were provided from the analysis of the interview data about usability in final product. The main themes and subthemes are presented in Table 4.27. Each theme is explained further using quotations from the interviews.

Table 4. 27

Themes and Subthemes About Usability in Final Product

Themes	Subthemes
Challenges	• Screen size could be limiting
Suggestions	• Need for transcripts of videos

4.3.2.2.2.1 Theme 1: Challenges about usability

This theme identified the challenges participants experienced regarding the usability of the mTPD course in final product. Due to the revisions made in first and second prototypes, participants experienced only one significant challenge about screen size.

Four interviewees reported some complaints about the screen size of the mobile devices they used in the course. One participant said that she got frustrated when she tried to type on her mobile phone but later, she switched to laptop for lesson planning, and she eliminated that problem then.

I always used mobile phone, I only had to use my computer while planning my lesson. My mobile phone was not very practical, I was having a hard time typing on the keyboard because I couldn't view the document completely. I only used my personal computer to plan a lesson. (P32)

Hep cep telefonu kullandım, bir tek ders planını yaparken bilgisayar kullanmak zorunda kaldım. Çok pratik değildi benim cep telefonum, belgeyi tam da görüntüleyemediğim için çok zorlanıyordum klavyede yazarken. Bir tek ders planı yaparken kişisel bilgisayarımı kullandım. (P32)

4.3.2.2.2.2 Theme 2: Suggestions about usability

This theme identified the suggestions from the interviewees to improve the usability features of the mTPD course. There was only one suggestion from one interviewee regarding the lack of transcripts in the video sections. She stated that adding transcripts of videos can create a better learner experience with more accessibility since some of the learners might have a hard time to comprehend experts' speech.

In the trainings I took before, a transcript was given at the bottom. I mean, it is not important for us, of course, but it may be useful for someone who is not very good at English and takes this course. (P40)

Önceden aldığım eğitimlerde altta bir de transkripti veriliyordu. Yani bizim için önemli değil tabi ama İngilizcesi çok iyi olmayan ve bu eğitimi alan bir başkası için bir faydası olabilir. (P40)

4.3.2.3 Perceptions About the Effectiveness of the mTPD Course

4.3.2.3.1 Quantitative Findings

Participants (n=25) were asked questions investigating their perceptions regarding the effectiveness of the mTPD course (Table 4.28). 64% of the participants (n=16) stated that they wanted to take another mTPD course in the future, while 32% of the participants (n=8) were hesitant and 4% of them (n=1) didn't want to take another mTPD course. 76% of the participants (n=19) acknowledged that they learned as much as they would in an in-person TPD course, while 8% of the participants were not sure and 16% of the participants didn't agree with this statement. 52% of the participants (n=13) stated that they preferred mTPD courses to in-person courses while 32% of the participants (n=8) were indecisive and 8% of the participants preferred in-person mTPD courses to mobile TPD courses. Lastly, 80% of the participants (n=20) agreed that mobile learning is a productive and convenient approach for TPD programs while 20% of the participants (n=5) were indecisive about this statement.

Table 4. 28

Results of the Course Evaluation Questionnaire About Effectiveness in Prototype 2

	Completely agree		Agree		Not sure		Disagree		Completely disagree	
	n	%	n	%	n	%	n	%	n	%
I am thinking about taking another mTPD course in the future.	6	24	10	40	8	32	1	4	-	-
In this mTPD course, I learned as much as I would in an in-person TPD course.	9	36	10	40	2	8	4	16	-	-
I prefer mTPD courses to in-person TPD courses.	6	24	7	28	8	32	2	8	2	8
Mobile learning is a productive and convenient approach for TPD programs.	7	28	13	52	5	20	-	-	-	-

4.3.2.3.2 Qualitative Findings

Two main themes emerged from the thematic analysis of the interviews: benefits and suggestions. The themes and their subthemes are presented in Table 4.29. Each theme is explained by giving examples from the interviews to gain a deeper understanding about the effectiveness of the mTPD course in final product.

Table 4. 29

Themes and Subthemes About Effectiveness in Final Product

Themes	Subthemes
Benefits	• Learning anytime and anywhere is possible due to mobility • Enabled autonomous learning • Enabled realization of using digital games as authentic learning sources • Prompted a way to reach students • Enabled the application of theory into practice • Provided an effective guideline • Enriched pedagogical knowledge • Made connections to the other teachers
Suggestions	• Need for feedback about course progress • Target group of the mTPD course

4.3.2.3.2.1 Theme 1: Benefits in final product

This theme identifies the benefits that participants think they gained from the mTPD course. There are eight subthemes under this theme: learning anytime and anywhere is possible due to mobility, enabled autonomous learning, enabled realization of using digital games as authentic learning sources, prompted a way to reach students, enabled the application of theory into practice, provided an effective guideline, enriched pedagogical knowledge, and made connections to the other teachers. Each subtheme is explained below with examples from interviews.

All nine interviewees remarked that learning anytime and anywhere is possible due to mobility. The interviewees agreed that it was a great advantage to access the same content at any time and place they wanted. One participant reported that she always studied the course on her mobile phone, and she was content with the opportunity to use her mobile device for something beneficial about her professional growth.

It was nice that it was free from time and place. It was good enough to do anywhere, let's say the discussion forums, to be able to have a quick look to see what was posted and post something myself. The videos and articles were also manageable. All the tasks were always within this scope. I always accessed the course over the phone. I just prepared my lesson plan from the computer. It wasn't too hard for me to do it on the phone. I am not normally someone who uses mobile phones a lot. I'm not someone who always has the phone in my hand, but I realized that I can use the phone for things that interest me, I've seen this. I mean, I had the opportunity to take the phone in my hand for something useful, and I said let's read this and complete this task. (P26)

Zaman ve mekândan bağımsız olması güzeldi. Herhangi bir yerde dışarıda, yani bir bakayım tartışma forumları da öyleydi yani hadi bir bakayım ne yazılmış hadi bir şuna bakayım hadi bir şunu yazıyım diyebileceğim uzunluktaydı. Baş edilebilir uzunluktaydı videolar ve okuma parçaları da. Bütün görevler yani hep bu çerçevedeydi. Eğitime hep telefondan eriştim. Sadece ders planımı bilgisayardan yaptım. Telefondan yapmak da çok zorlamadı beni. Ben normalde çok fazla telefon kullanan da birisi değilim. Telefonu öyle sürekli elimde olan birisi de değilim ancak telefonu demek ki ilgim olan şeylerde kullanabiliyorum, bunu görmüş oldum. Yani telefonu yararlı bir şey için elime almış olma imkânım oldu eğitim boyunca ve her an hadi şunu okuyayım şu taskı tamamlıyayım dedim. (P26)

Six interviewees reported that they had the autonomy to control their learning process in the mTPD course. They liked the fact that they were independent and could complete the tasks without constantly needing teacher authority. One participant shared her opinion supporting this statement and added that the autonomous learning setting sustained continuous interaction relevant to the theme of the topic.

When it comes to in-person or mobile, I would definitely prefer mobile because I felt like it was a completely private lesson in which I could go at my own pace and express myself as I wanted. That's an advantage. The second advantage is that when in-person, for example, when I ask a question, if you were giving this course in-person, when you ask us a question as an instructor, I mean, the course of the conversation continues as someone says something. So it's always like this, but when you're mobile, you can change the theme of the discussion on this forum whenever you want, and no one says anything about it. So it goes better in that sense. It is much more interactive, not by speaking, but by typing. (P28)

Bu eğitimi yüz yüze ya da mobil söz konusu olduğunda kesin mobili tercih ederdim çünkü istediğim hızda gidebildiğim ve istediğim şekilde kendimi ifade edebildiğim tamamen bana özel bir ders gibi hissettim bunu. Bir avantajı bu. İkinci avantajı da, yüz yüze olduğu zaman mesela bir soru sorduğumda, sen bu eğitimi bize yüz yüze veriyor olsaydın, eğitmen olarak bize bir soru sorduğunda, yani konuşmanın gidişatı genel çerçeveye göre birisi bir şey söylediğinde onun üstünden devam ediliyor haliyle. Yani her zaman bu böyle ama böyle mobil olduğunda yaptığımız yorumları vesaire bu forumda istediğin an değiştirebiliyorsun ve kimse de ne alaka demiyor. Yani daha güzel gidiyor o anlamda. Konuşarak değil ama yazarak çok daha etkileşimli gidiyor. (P28)

All nine interviewees stated that the mTPD course enabled realization of using digital games as authentic learning sources. They stated that they had never thought that computer games could be used in foreign language teaching, but after receiving this training, their ideas changed partially. One interviewee stated that she had had prejudice against computer games and that she had thought these games could only be used for entertainment purposes. However, she said that her opinion changed with this course, and that she was happy to learn a new method.

I think I had prejudices against teaching English as gaming. Yes, it's nice that all of my students are playing, actually it can be done, but it seemed like, I used to think that it could be done in this way to entertain them as an activity once a month, but the idea of designing it into the curriculum is a little different for me. It wasn't impossible, it was actually doable. This course actually opened a window for me, I guess, that was the best part. (P32)

Sadece gaming olarak İngilizce öğretimi konusuna zannediyorum önyargılıydım. Evet ne güzel hani öğrencilerimin hepsi oynuyor, aslında yapılabilir ama bana daha çok şey gibi geliyordu. Hani ayda bir aktivite olarak onları eğlendirmek için falan bu şekilde yapılabilir gibi düşünüyordum ama müfredata dizayn etmek fikri bana biraz daha değişik. İmkansız değilmiş yani aslında yapılabilirmiş. Böyle küçük bir bana bir pencere açtı aslında sanırım, en güzel tarafı buydu. (P32)

Another participant stated that she was skeptical of these types of games before because she did not have enough qualifications, but now she needs to take initiative to use these games in the classroom.

I thought that I wouldn't be able to reflect what I learned and transfer it to the class because I had no experience. Frankly, my doors were closed against the games. Normally, I don't intend to include very new technologies in the class, I'm not very willing. I don't have that much experience, or I don't play games, I was thinking how I could get involved, but I know that after this course, it will be included somehow. Now I know we can somehow include it, and I realized it. I am aware of this, and frankly, I think that I should include it, rather than being able to include it. (P23)

Benim tecrübem olmadığı için öğrendiklerimi yansıtamayacağımı ve sınıfa aktaramayacağımı düşünüyordum. Açıkçası kapılarım kapalıydı oyunlara karşı. Çok yeni teknolojileri sınıfa dahil etme açısından da aynı şekilde çok böyle yeltenmiyorum, çok istekli olmuyorum. O kadar tecrübem yok ki, ya da oyun oynamıyorum nasıl dahil edebilirim diye düşünüyordum ancak eğitimden sonra bir şekilde dahil olacağını biliyorum. Artık bir şekilde dahil edebileceğimizi biliyorum ve fark ettim. Bunun farkındayım ve dahil edebilmek değil dahil etmem gerektiğini de düşünüyorum açıkçası artık. (P23)

All nine interviewees reported that the mTPD course prompted a new way to reach students. One interviewee stated that they took this course on integrating digital games into language teaching, but in fact, she realized something different by the help of this course. She realized that she could use any material that is not actually used for educational purposes as a teaching material by using the right teaching approaches.

The training you gave us, the training we completed, was like, it was about integrating games into the lesson, enriching their learning, but there was a different change in my perspective. I mean, not only games, but anything that will attract the attention of the student can definitely be used as a tool. You know, course materials and so on, yes they are used for standardization, but it showed to me more that one should not be afraid or worried about using new things to attract students into the lesson and increase their motivation. (P43)

Senin bize verdiğin eğitim yani tamamladığımız eğitim şey gibiydi, oyunları bir şekilde derse entegre etmek zenginleştirmekle ilgiliydi ama benim bakış açımda daha farklı bir değişiklik oldu. Yani sadece oyunları değil ama öğrencinin ilgisini çekecek herhangi bir şey araç olarak kullanılabilir kesinlikle. Hani ders materyalleri vesaire evet standardizasyon için var ama birtakım şeyleri adapte ederek öğrenciyi dersin içine çekmek ve motivasyonunu artırmak için yeni şeyler

kullanmaktan korkmamak ya da endişe etmemek gerektiğini bana daha çok yansıttı. (P43)

Another interviewee reported that it is getting more and more difficult to motivate students in their classrooms and that they can attract their attention by finding new ways such as digital games that will appeal to their interests.

It is really difficult to provide student motivation. In our schools, children neither want to study nor do anything else. I mean, they do things that are related to their interests, but you have to force things outside of their interests. Of course, the same result does not happen when you force it, but when they always participate in things that are of interest to them, their motivation increases, and their participation increases. That's why I think, I mean, I recommend using this course. Honestly, I'll try it when I have the chance. (P39)

Öğrenci motivasyonu sağlamak hakikaten çok zor. Bizim okullarımızda çocuklar ne okumak istiyorlar ne de bir şeyler yapmak istiyorlar. Yani kendi ilgi alanlarıyla ilgili olan şeyleri yapıyorlar ama kendi ilgi alanları dışında olanları zorlamak durumunda kalıyorsunuz. Zorlayınca da aynı sonuç olmuyor tabii ama her zaman kendi ilgisi olan şeylere katıldığında motivasyonları artıyor, katılımı artıyor öğrencilerin. O yüzden bence bu yüzden bu dersin kullanılmasını tavsiye ederim. Ben de fırsatım olduğunda deneyeceğim açıkçası. (P39)

Five interviewees stated that mTPD course enabled the application of theory into practice. They expressed their satisfaction with the preparation of a lesson plan that could be implemented directly in the classroom right after learning the theoretical information. One participant stated that the professional development trainings she attended before were generally theory-based and this led to disappointment. But she said that she was happy to do try-out tasks given at the end of each unit in this course.

I really liked the balance of theory and practice. Not just in terms of theory, I mean, whenever we participate in a training, they all look alike, I mean, more theory. While we expect something practical, the theory outweighs and there is disappointment or the reality doesn't not meet expectations. However, I paid particular attention to this one, I mean, it was very nice to have practical activities, that theory-practice balance was very good. (P26)

Teori ve pratik dengesini çok beğendim. Sadece teori açısından değil, yani vardır ya, her eğitime gittiğimiz zaman hepsi birbirine benziyor, yani teori daha çok. Pratik bir şeyler beklentimiz varken teori ağır basıyor ve yine hayal kırıklığı oluyor ya da beklenti karşılamayan durumlar oluyor. Ancak bunda ben özellikle dikkat ettim, yani pratiğe yönelik aktivitelerin olması çok güzeldi, o teori pratik dengesi çok iyiydi. (P26)

Three interviewees stated that the mTPD course provided an effective guideline. They said that the course content served as a resource to guide them how to integrate digital games and from now on, they would check these guidelines before bringing a digital game to their classroom. One interviewee reported that she would be able to use any technological activity effectively by making meaningful connections between the new technological resource and what she learned in this course.

Even if it is a game or any technological activity, I come across many things that I can do and that I find very nice every day. Now I know this before I take it to class; What seems to be nice to me is not taken to class only because it is nice. I mean, I was doing it in my own way, but I wasn't looking at it so consciously. What can I do with a pcard, in particular, does it really interest my students? At this stage, I mean, I can think of intervening while playing games, and there is nothing wrong with that. Wait a minute, let them socialize and play in their environment, these were things that I either forgot or never knew. I thought to myself, I will probably always be careful when I take such steps. Not just for gaming but even someone like me is considering playing games. (P28)

Bu oyun olmasa da, herhangi bir teknolojik aktivite de olsa, yapabileceğim ve çok güzel dediğim bir çok şeyle karşılaşıyorum her gün. Götürmeden önce artık şunu biliyorum; bana güzel gelen şey güzel diye sınıfa götürülmez. Yani kendi çapımda yapıyordum ama bu kadar bilinçli bakmıyordum olaya. Özellikle işte pcardla ne yapabiliri, yani bu gerçekten öğrencilerimin ilgisini çeker mi, işte şu aşamada ben mesela oyun oynarken de müdahale etmeyi düşünebilirim ve bunda bunda bir şey yok. Dur bakalım biraz onlar sosyalleşsin ortamlarında oynasınlar diyor ya, bunlar benim ya unuttuğum ya da hiç bilmediğim şeylerdi. Kendimi düşündüm, bundan sonra herhalde hep dikkatli olacağım bu tür bu tarz adımlar atacakken. Sadece oyun için değil ama benim gibi biri bile oyun oynatmayı düşünüyor. (P28)

Five instructors reported that the mTPD course enriched their pedagogical knowledge. They stated that they enjoyed learning new skills related to their profession and learning new information that would enable them to do things they would not normally

do in the classroom. For example, an interviewee shared an anecdote. She said that in her first year as a teacher, she was reprimanded by her director for using an extra material she developed herself in a video lesson. 16 years later, she felt very happy to be able to prepare a worksheet about a digital game and take it to the class. Another interviewee reported that the course allowed her to expand her knowledge base in a different field.

I liked working on something I don't normally do because it was a different topic for me. Reading, getting ready, answering some questions about it or having an idea in a different field is something I always like, so I liked it in general. (P32)

Normalde yapmadığım bir şeyin üzerine çalışmak hoşuma gitti çünkü farklı bir konuydu benim için. Okumak hazırlanmak onunla ilgili birtakım sorulara cevap vermek ya da farklı bir alanda fikir sahibi olmak benim her zaman hoşuma giden bir şey zaten, o yüzden genel anlamda sevdim. (P32)

Lastly, all nine interviewees stated that the discussion activities with other teachers in the mTPD course helped them make connections to the other teachers. One interviewee reported that the fact that they were able to react to the content and share their challenges with their colleagues made them feel safe and comfortable.

We had a discussion, you know, I liked the interaction there. It is very nice to see the ideas of others and to establish a chat environment with them and to give each other feedback. I have benefited very usefully. It created a safe zone for me, the things discussed there made me feel that I was not alone. (P29)

Tartışma yaptık ya hani oradaki etkileşimi sevdim. Başkalarının fikirlerini de görüp onlarla bir sohbet ortamı kurmak, birbirimize dönüt vermek çok güzel yani ben çok faydalı faydalandım, bir safe zone yarattı bana orada konuşulan şeyler, yalnız olmadığımı hissettirdi bana. (P29)

Another interviewee reported that it had been a long time since they were last involved in an organized school activity together. Being able to communicate with their colleagues on this platform socially promoted them a sense of community.

Since it's our school group, you know for quite some time normally we don't hold meetings or anything else. I mean, here friends send likes to each other, they refer to each other. So I said what a nice environment, I saw what I have been missing there. It was a personal thing for satisfaction. (P35)

Bizim okul grubu olduğu için normalde epey uzun bir süredir biliyorsun ne toplantı yapıyoruz ne de başka bir şey. Yani arkadaşlar birbirlerine like atıyorlar, işte birbirlerini refere ediyorlar. Yani dedim ki ne kadar güzel bir ortam yani, özlediğim şeyi de orada görmüş oldum. Kişisel bir şey oldu yani memnuniyet için. (P35)

Another interviewee mentioned that she was able to learn from others by reading the other posts in the discussion forums.

For example, you asked a question in the discussion forum, I thought about it from a point of view, I answered it, but I started to read people's posts and there were different angles, I really saw it in those forums. Especially when they asked the expert, I saw many different angles, I liked it. It was also very nice of him to respond immediately, so someone is following you, someone is watching you. Getting those feedbacks was a plus for me. I mean, if I hadn't received anything, maybe I wouldn't have felt the need to continue or I wouldn't have posted on the forums. (P39)

Tartışma forumları konusunda mesela kişiye bir soru sordun, ben bir açıdan düşündüm onu cevap verdim ama insanlarınkini de okumaya başladım ve farklı açılar da varmış gerçekten o forumlarda onu gördüm. Hele bilirkişiye sorduklarında çok değişik açılar gördüm, o benim hoşuma gitti. Bir de onun hemen cevap vermesi de çok güzeldi yani birisi seni takip ediyor, birisi seni izliyor. O dönütlerin alınması benim için artı bir şeydi. Yani hiçbir şey almamış olsam belki devam etme ihtiyacı duymazdım ya da forumlara yazmayabilirdim. (P39)

4.3.2.3.2.2 Theme 2: Suggestions about effectiveness

This theme identifies the suggestions of the interviewees to improve the effectiveness of the mTPD course. There are two subthemes: need for feedback about course progress and target group of the mTPD course. Each theme is explained with examples below.

In previous prototype implementations, interviewees indicated that they expected to receive more feedback on their course progress. Considering this suggestion, a progress sheet was prepared in this final product implementation and was shared with all the participants on a regular basis every day. However, as understood from the feedback shared by the three interviewees in this last implementation, following their progress on a list accessible by all participants in the course created stress and anxiety in the participants. One participant stated that she stopped checking this list after noticing her discomfort and that she decided to check it as a final control.

There is a progress list of those who finished there, that we followed our progress. At first, when I was looking at it, I had the feeling that I was behind, and I thought I needed to speed up a little more. However, after that, I realized that it bothered me, and I said I would go at my own pace and see if I have done all the necessary tasks for control purposes. I made such a decision. After that, I did not have such a problem, but at first, as I said, I was following the progress of others and the state of staying behind bothered me. (P35)

Orada bitirenlerin yani orada bir ilerleme listesi var ya ilerlememizi takip ettiğimiz. İlk başlarda onlara bakarken geride kaldım hissi oluyordu ben de ve biraz daha hızlanmam gerekiyor diye düşünüyordum. Ancak ondan sonrasında bunun beni rahatsız ettiğini fark ettim ve dedim ki ben kendi hızında ilerleyeceğim ve en son kontrol amaçlı bütün gereken görevleri yapmış mıyım yapmamış mıyım diye bakacağım dedim. Böyle bir karar verdim. Ondan sonra zaten böyle bir sıkıntım olmadı ama ilk başlarda böyle dediğim gibi diğerlerinin ilerlemesini takip ediyordum ve geri kalmışlık durumu beni rahatsız ediyordu. (P35)

Three participants identified the characteristics of the target group of this mTPD course. One participant stated that if this course is compulsory for everyone, it will not be very effective. She added that the course could be effective if it is given to the teachers who are open to games or such innovative teaching methods.

We learned the following in the course content; if the student does not want and is reacting, do not force it. I think it's the same for the teacher; If he is interested, likes to play games, if he has a game that he has been playing for years, he can use it very comfortably, but as I read in the forums, our friends who are already far from this field did not feel very comfortable in integrating this into the lesson. So, I think it might be optional. Those who are interested should learn how to integrate games into their lessons, but if the person has never played a game in his life and does not enjoy it, I think teachers should not be forced too much. (P35)

Biz dersin içeriğinde şunu öğrendik; eğer öğrenci istemiyorsa ve tepkiliyse zorlamayın. Bence öğretmen açısından da aynı şey; eğer ilgisi varsa, oyun oynamayı seviyorsa, yıllardır oynadığı bir oyun varsa çok rahat bir şekilde kullanabilir ama forumlarda okuduğum kadarıyla zaten bu işe uzak olan arkadaşlarımız kendilerini çok rahat hissetmediler bunu derse entegre etme konusunda. Dolayısıyla bu da seçmeli olabilir diye düşünüyorum. İlgisi olanlar oyunların dersine nasıl entegre edileceğini öğrenmeliler ama adam hayatında hiç oyun oynamadıysa ve bundan keyif almıyorsa vesaire, bence çok zorlamamak gerekir öğretmenleri. (P35)

4.3.3 Research Question 2

Participants in the final product implementation completed using digital games in teaching questionnaire before and after the mTPD course to investigate the change in their perceptions. There were 19 items to evaluate their perceptions. Participants expressed their opinions on a five-point scale, 'strongly agree (1), agree (2), not sure (3), disagree (4), and strongly disagree (5)'. Descriptive results of the perception questionnaire were given in Table 4.30.

Table 4. 30 (continued)

Descriptive Results of the Perception Questionnaire in Final Product

	Pretest			Posttest		
	n	M	SD	n	M	SD
1. Digital games enhance the quality of my job.	25	4.32	0.63	25	4.36	0.49
2. Digital games in my job increase my productivity.	25	3.48	0.92	25	3.60	0.82
3. Digital games enhance my effectiveness in my job.	25	3.44	0.92	25	3.56	0.82
4. I find digital games to be useful in my job.	25	3.92	0.76	25	3.92	0.86
5. Using digital games makes teaching easy.	25	3.60	0.71	25	3.16	0.80
6. I know how to use digital games in classroom setting.	25	2.12	0.88	25	3.56	0.87
7. I have the necessary skills to use digital games in a classroom setting.	25	2.32	0.90	25	3.40	1.00
8. I have used digital games before in classroom.	25	2.32	1.25	25	1.60	0.65
9. I have experience with the use of digital games in the classroom.	25	2.16	1.11	25	1.80	0.96
10. Digital games offer opportunities to experiment with knowledge.	25	3.76	0.72	25	4.16	0.37
11. Digital games offer opportunities to take control over the learning process.	25	3.44	0.58	25	3.80	0.58
12. Digital games offer opportunities to experience things you learn about.	25	3.84	0.62	25	4.04	0.46
13. Digital games offer opportunities to stimulate transfer between various subjects.	25	3.88	0.67	25	4.20	0.58
14. Digital games offer opportunities to think critically.	25	3.96	0.61	25	4.48	0.59
15.Digital games offer opportunities to motivate students.	25	4.04	0.68	25	4.40	0.65
16. Digital games fit the curriculum.	25	3.28	0.68	25	3.44	0.92

Table 4. 30 (continued)

Descriptive Results of the Perception Questionnaire in Final Product

	Pretest			Posttest		
	n	M	SD	n	M	SD
17. It is clear how digital games can be used to fit the curriculum.	25	3.08	0.76	25	3.88	0.78
18. I am planning to use digital games in the classroom.	25	3.52	0.87	25	3.60	0.87
19. In the future, I intend to use digital games in the classroom.	25	3.88	0.73	25	3.84	0.80

Using Digital Games in Teaching Questionnaire is composed of six constructs. These are usefulness (items between 1-5), ease of use (items 6-7), experience (items 8-9), learning opportunities (items between 10-15), curriculum relatedness (items 16-17) and behavioral intention (items 18-19). A paired samples t-test was conducted to determine whether there was a significant change in the perceptions of the participants regarding these constructs before and after the mTPD course in final product (Table 4.31). In order to avoid inflated Type 1 error, the *p*-value was adjusted using Bonferroni correction.

Table 4. 31

Results of the Paired Samples T Test in in Final Product Examining Participants'
Perceptions About Digital Games

	Before		After				Cohen's d
	M	SD	M	SD	t(24)	p	
Usefulness	18.76	3.38	18.60	3.12	0.18	0.855	0.04
Ease of use	4.44	1.69	6.96	1.77	5.18	0.000*	1.03
Experience	4.48	2.33	3.40	1.50	1.87	0.074	0.37
Learning Opportunities	22.92	3.135	25.08	2.23	3.04	0.006*	0.61
Curriculum relatedness	6.36	1.29	7.32	1.41	2.39	0.025	0.48
Behavioral intention	7.40	1.47	7.44	1.61	0.10	0.922	0.02

Note: Mean parameter values for each of the analyses are shown for the participants in final product ($n = 25$), as well as the results of t tests comparing the scores before the mTPD course and after the mTPD course. An increase in the mean scores means an increase in agreement.

p value was adjusted for multiple comparisons with Bonferroni.

$* p < .008$

Results of the analysis indicated two significant findings. Items related to 'Ease of use' construct aimed to understand participants' perceptions about their skills to use digital games in their classrooms. Perception scores of participants about the ease of use of digital games in teaching were significantly higher in posttest (M = 6.96, SD = 1.77) than in pretest (M = 4.44, SD = 1.69), $t(24) = 5.18$, $p = 0.000$.

Items related to 'learning opportunities' construct were asked to understand the perceptions of the participants about the learning opportunities digital games offer. Perceptions of participants about the learning opportunities of digital games changed significantly in pretest (M = 22.92, SD = 3.13) and in posttest (M = 25.08, SD = 2.23), $t(24) = 3.04$, $p = 0.006$. The change in the other constructs were found to be insignificant according to the analysis.

4.3.4 Research Question 3

The third research question aimed to investigate how much the mTPD course on DGELL contributed to participants' knowledge on DGELL in theory and practice. To this end, the research question was investigated in two ways, and the same procedure was followed as in prototype 1 and 2. First, an achievement test was given to the participants before and after the mTPD course to see how the mTPD course affected their theoretical knowledge on DGELL. Second, participants were asked to prepare a lesson plan on DGELL to understand if they were able to apply this knowledge acquired from the mTPD course in a lesson plan. By using the lesson plan assessment, the researcher was able to investigate if participants were able to apply this new approach by using their pedagogical content knowledge and not just recite the theory behind it.

The pre-post achievement tests were completed by 25 participants. A dependent samples T-test was conducted to evaluate whether participants' achievement test scores changed significantly after the mTPD course (Table 4.32). The results indicated a significant change in the pretest, (M = 6.92, SD = 3.95) and in posttest (M = 15.32, SD = 2.67), $t(24) = 9.47$, $p = 0.000$. We can conclude from this finding that participants' knowledge on DGELL improved significantly after taking the mTPD course.

Table 4. 32

Results of the Paired Samples T-Test of Achievement in Final Product

	Before		After				
	M	SD	M	SD	t(24)	p	Cohen's d
Achievement	6.92	3.947	15.32	2.673	9.471	0.000*	1.894

Note: Mean parameter values for pretest and posttest achievement scores are shown for the participants in final product ($n = 25$), as well as the results of *t* tests comparing the achievement test scores before the mTPD course and after the mTPD course. Maximum score participants can get from the achievement test is 20.

* $p < .05$

Assessing participants' lesson plans, the researcher followed the same procedure as in the first and second prototype. At the end of unit 3 in the mTPD course, participants were expected to create a lesson plan which was supposed to include multiple aspects of their pedagogical content knowledge on DGELL. 20 participants submitted their lesson plans, and these lesson plans were evaluated with a holistic rubric (Appendix E). The rubric was one dimensional and it assessed participants' overall achievement of the task. The criterion of the rubric was to use PCaRD model while integrating a digital game into their teaching and develop pedagogical activities in each phase of PCaRD model that is in congruent with the DGELL approach. As can be seen in Table 4.33, 85% of the participants (n=17) were able to demonstrate a complete understanding of the DGELL and use all the phases of PCaRD model consistently. 10% of the participants (n=2) showed a considerable understanding of the subject matter in practice and applied at least 3 components of PCaRD model. 5% of the participants (n=1) executed the components of PCaRD model in their lesson plans partially and developed the phases of the model inconsistently.

Table 4. 33

Lesson Plan Assessment Scores of Participants in Final Product

Criteria	n	%	Score
1. Lesson plan demonstrates complete understanding and execution of Digital Game-Enhanced Language Learning. It contains all components of PCaRD model, and they are accurately implemented throughout the lesson plan.	17	85%	4 (80-100%)
2. Lesson plan demonstrates considerable understanding and execution of Digital Game-Enhanced Language Learning. At least 3 components of PCaRD model are applied but may exhibit inconsistency in terms of balance in developing the phases of the model.	2	10%	3 (60-79%)
3. Lesson plan demonstrates some understanding and execution of Digital Game-Enhanced Language Learning. The components of PCaRD model are faintly stated, and the lesson plan is inconsistent in terms of balance in developing the phases of model.	1	5%	2 (40-59%)
4. Lesson plan demonstrates limited understanding and execution of Digital Game-Enhanced Language Learning. The components of PCaRD model are not stated, and the lesson plan is simplistic, unoriginal, and/or not is unbalanced in developing the phases of the model.	-	-	1 (1-39%)

Note: 20 participants submitted their lesson plans.

4.4 Comparison of Different Cycles

4.4.1 Comparison of Participants' Perceptions About the mTPD Course

4.4.1.1 Participants' Perceptions About the Content

All the participants in different cycles (two prototypes and one final product) completed the course evaluation questionnaire after the mTPD course. They were first asked how much of the content they completed in the course. As can be seen in Figure 4.13, while participants completed 80% of all the content in prototype 1, the completion rate increased to 98% in the final product.
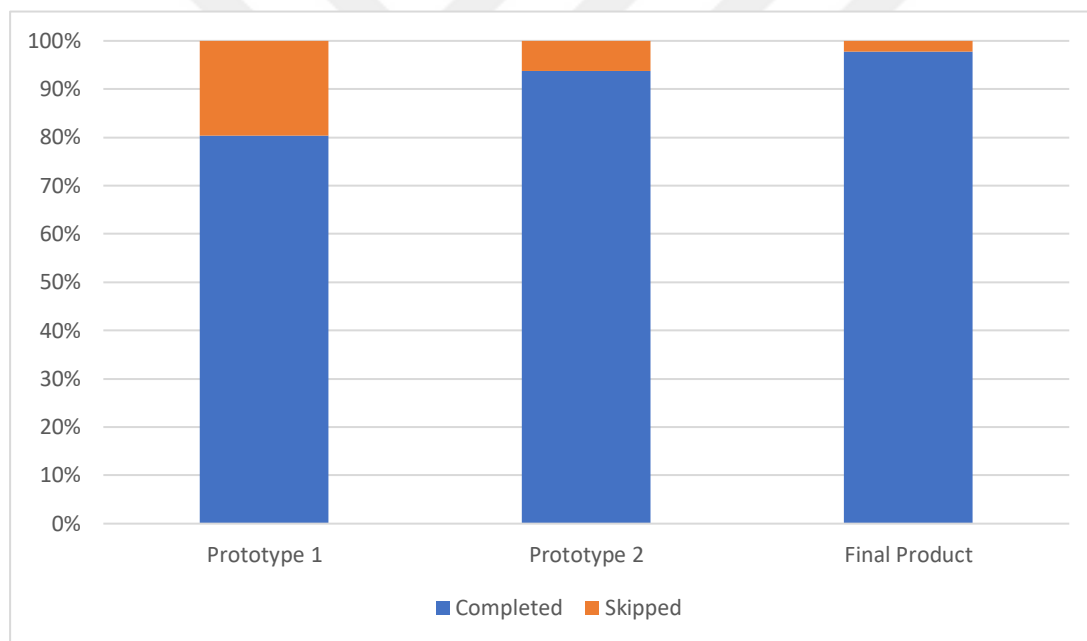
Figure 4. 13. Distribution of Course Content Completed by the Participants in All Cycles.

Participants were asked to evaluate the importance of each content in the mTPD course. They expressed their opinions on a five-point scale (1=very important, 2=important, 3=not sure, 4=slightly important, 5=not important). Table 4.34 presents the descriptive results of these items for all cycles. The mean value of total scores of

all the content areas was 12.63 (n=8) in first prototype and the total mean value decreased to 10.91 (n=11) in the second prototype. The total mean value of the participants attended in the final product implementation was 11.52 (n=25).

In the first prototype, the mean scores of all content areas were below 2, except for warm-up tasks and discussion forums. In prototype 2 and final product, discussion forum was the only content area which had a mean score above 2. It can be understood that participants in all cycles were satisfied with video lectures, written lectures, lecture tasks, try-out tasks and achievement tests. In the first implementation, participants were not sure about the importance of warm-up tasks and discussion forums. Lastly, participants in all cycles were doubtful about the importance of discussion forums.

Table 4. 34

Results of the Course Evaluation Questionnaire About the Importance of Content in All Cycles

	Prototype 1			Prototype 2			Final Product		
	n	M	SD	n	M	SD	n	M	SD
Warm-up Tasks	8	2.13	1.25	11	1.64	0.51	25	1.60	0.71
Video Lectures	8	1.38	0.52	11	1.09	0.30	25	1.28	0.46
Written Lectures	8	1.63	0.74	11	1.18	0.41	25	1.56	0.58
Lecture Tasks	8	1.88	0.64	11	1.45	0.52	25	1.56	0.58
Try-out Tasks	8	1.63	0.74	11	1.36	0.51	25	1.40	0.71
Discussion Forum	8	2.13	0.84	11	2.36	0.81	25	2.36	0.81
Achievement Test	8	1.88	0.64	11	1.82	0.98	25	1.76	0.60
Total Score	8	12.63	4.10	11	10.91	2.63	25	11.52	3.00

Note: Very Important (1) ; Not Important At All (5)

Participants were asked 10 questions to investigate their perceptions about the content. They expressed their opinions on a five-point scale (1=strongly agree, 2=agree, 3=not sure, 4=disagree, 5=strongly disagree). Table 4.35 presents the descriptive results of these items for all cycles. The mean value of total scores decreased from the first

prototype through final product. The mean value of total scores of the perceptions about content was 17.25 (n=8) in first prototype. The total mean value decreased to 15.09 (n=11) in the second prototype and the total mean value of the participants attended in the final product implementation was 13.68 (n=25). In all cycles, the mean scores of all items were below 2, except for discussion forums in prototype 1 and 2. It can be concluded that perceptions of participants about the content of the mTPD course changed positively as the program was being redeveloped in iterative cycles. On the other hand, participants in the final product thought discussion forums helped them learn other people's opinions about the subject, while participants in the prototypes were not sure about this statement.

Table 4. 35 (continued)

Results of the Course Evaluation Questionnaire About the Quality of Content in All Cycles

	Prototype 1			Prototype 2			Final Product		
	n	M	SD	n	M	SD	n	M	SD
1. Content was clear.	8	1.38	0.52	11	1.45	0.52	25	1.16	0.37
2. Content followed a logical order.	8	1.25	0.46	11	1.27	0.47	25	1.36	0.86
3. Content of the course helped me learn DGELL.	8	1.63	0.74	11	1.18	0.41	25	1.40	0.50
4. Content of warm-up tasks were in congruent with the content taught.	8	2.00	1.41	11	1.36	0.51	25	1.28	0.61
5. Video lectures helped me learn the subjects.	8	1.50	0.54	11	1.45	0.69	25	1.32	0.48
6. Written lectures helped me learn the subjects.	8	1.75	0.89	11	1.55	0.52	25	1.36	0.49

(continued)

Table 4. 35 (continued)

Results of the Course Evaluation Questionnaire About the Quality of Content in All Cycles

	Prototype 1			Prototype 2			Final Product		
	n	M	SD	n	M	SD	n	M	SD
7. Rubrics were sufficient.	8	1.75	0.89	11	1.09	0.30	25	1.28	0.46
8. Try-out tasks reinforced my learning.	8	1.75	0.89	11	1.45	0.69	25	1.48	0.65
9. Discussion forums helped me learn other people's opinions about the subject.	8	2.50	0.93	11	2.64	1.12	25	1.72	0.89
10. Achievement tests were good enough to assess my learning.	8	1.75	0.89	11	1.64	0.81	25	1.32	0.48
Total Score	8	17.25	6.11	11	15.09	3.73	25	13.68	3.94

Note: Completely agree (1) ; completely disagree (5)

4.4.1.2 Participants' Perceptions About Usability

Participants were asked how much time they spent for each unit in the mTPD course (Table 4.36). In prototype 1 and final product, majority of the participants spent between 30 minutes and 1 hour for each unit, while majority of the participants in prototype 2 spent between 1-2 hours for each unit. It can be concluded that the average time devoted to each unit in the mTPD course ranged from 30 minutes to 2 hours.

Table 4. 36

Time spent on each unit in the mTPD course in Prototype 1

	Prototype 1		Prototype 2		Final Product		Total (n=44)	
	n	%	n	%	n	%	n	%
Less than 30 minutes	1	12	1	9	2	8	4	9
30 minutes – 1 hour	5	62	3	27	13	52	21	48
1 – 2 hours	1	13	6	55	7	28	14	32
More than 2 hours	1	13	1	9	3	12	5	11

In the course evaluation questionnaire, participants in all cycles were expected to evaluate the usability of the mTPD course on a five-point scale (1=strongly agree, 2=agree, 3=not sure, 4=disagree, 5=strongly disagree). The mean value of total scores of the perceptions of participants about usability showed a decline from the first prototype through the final product (Table 4.37). The total mean value in the first prototype was 10.50 (n=8) in first prototype, while it was 8.91 (n=11) in the second prototype and 7.44 (n=25) in the final product. In all cycles, the mean scores of all items ranged from 1.08 to 1.60 except for items 1 and 6. In the first prototype, the mean score for item 1 was above 2 but in prototype 2 and final product, it showed a decline. The mean value for item 6 was above 2 in the first and second prototype but it dropped below 2 in the final product. It can be concluded that as the usability features of the mTPD course were being developed, the perceptions of participants changed positively in each iterative cycle. Additionally, participants in the first and second prototype had problems using discussion forums to communicate with other learners but in the final product implementation, participants thought they were able to communicate with their peers in discussion forums easily.

Table 4. 37

Results of the Course Questionnaire About Usability in All Cycles

	Prototype 1			Prototype 2			Final Product		
	n	M	SD	n	M	SD	n	M	SD
1. Course interface was easy to use.	8	2.38	1.06	11	2.09	1.04	25	1.60	0.87
2. I was able to open and watch the videos easily.	8	1.38	0.74	11	1.27	0.47	25	1.16	0.37
3. I was able to log in the Schoology course easily.	8	1.25	0.46	11	1.09	0.30	25	1.08	0.28
4. All links were working well.	8	1.38	0.52	11	1.00	0.00	25	1.08	0.28
5. I was able to do and share my assignments on Schoology app without any problem.	8	1.50	0.76	11	1.18	0.41	25	1.08	0.28
6. I was able to communicate with other learners in discussion forums easily.	8	2.63	1.30	11	2.27	0.91	25	1.44	0.77
Total Score	8	10.50	3.66	11	8.91	2.26	25	7.44	2.18

Note: Completely agree (1) ; completely disagree (5)

4.4.1.3 Participants' Perceptions About Effectiveness

Participants were asked 4 questions to investigate their perceptions about the effectiveness of the mTPD course (Table 4.38). They expressed their opinions on a five-point scale (1=strongly agree, 2=agree, 3=not sure, 4=disagree, 5=strongly disagree). The mean value of total scores of the perceptions of participants about the effectiveness of the mTPD course was 8.25 (n=8) in first prototype and the mean value of total scores in the second prototype dropped to 6.27 (n=11). However, the mean

value of total scores increased to 8.60 (n=25) in the final product implementation. The mean scores of all items ranged from 1.09 to 2.50. Item 4 is the only item which had a mean score below 2 in all cycles. It can be concluded from the results that most of the participants think they learned as much information as they would in an in-person TPD course. Additionally, they also think mobile learning is a productive and convenient approach for TPD programs. However, participants are not sure if they would prefer mTPD courses to in-person TPD courses.

Table 4. 38

Results of the Course Evaluation Questionnaire About Effectiveness in All Cycles

	Prototype 1			Prototype 2			Final Product		
	n	M	SD	n	M	SD	n	M	SD
1. I am thinking about taking another mTPD course in the future.	8	2.50	1.20	11	1.09	0.30	25	2.16	0.85
2. In this mTPD course, I learned as much as I would in an in-person TPD course.	8	1.75	0.89	11	1.45	0.52	25	2.04	1.06
3. I prefer mTPD courses to in-person TPD courses.	8	2.13	1.13	11	2.18	0.60	25	2.48	1.19
4. Mobile learning is a productive and convenient approach for TPD programs.	8	1.88	0.84	11	1.55	0.69	25	1.92	0.70
Total Score	8	8.25	3.58	11	6.27	1.56	25	8.60	3.25

Note: Completely agree (1) ; completely disagree (5)

4.4.2 Comparison of the Results of Using Digital Games in Teaching Questionnaire

Using digital games in teaching questionnaire consisted of six constructs. These are usefulness (items between 1-5), ease-of-use (items 6-7), experience (items 8-9), learning opportunities (items between 10-15), curriculum relatedness (items 16-17) and behavioral intention (items 18-19). A Kruskal-Wallis test and Dunn test were conducted to compare all three cycles (prototype 1, prototype 2 and final product) and to determine if there are statistically significant differences between the groups.

The pretest scores of 'ease-of-use' construct showed that there was a statistically significant difference between the groups, $\chi^2(2, N = 44) = 21.246$, $p<.001$), with a median of 4.50 for the first prototype, 8 for the second prototype and 12 for final product. Dunn test was conducted to evaluate pairwise differences among the three groups. The results of these tests indicated that scores in prototype 1 were significantly different from those of final product ($p<.001$). No other differences were statistically significant with the items related to the ease-of-use construct in the pretest.

The posttest scores of the 'ease-of-use' construct also showed significant difference, $\chi^2 (2) = 21.639$, $p<.001$), with a median of 4.50 for the first prototype, 8 for the second prototype and 6 for final product. Pairwise comparisons using Dunn's test indicated that participants' scores in prototype 2 were significantly different from those of prototype 1 ($p = 0.000$) and final product ($p = 0.001$). No other differences were statistically significant with the items related to the ease-of-use construct in the posttest.

Table 4. 39

Descriptive Statistics for Ease-of-Use Construct

Group	n	Mean (Pre/Post)	SD (Pre/Post)	Mean Rank (Pre/Post)
Prototype 1	8	4.75/4.38	1.16/1.41	6.19/10.75
Prototype 2	11	8.36/8.91	3.04/2.55	18.73/36.23
Final Product	25	11.40/5.64	3.12/1.29	29.38/20.22

The results of the items related to the 'experience' construct in the pretest indicated significant difference in different cycles, $\chi^2(2, N = 44) = 10.945$, $p = 0.004$), with a median of 4 for the first prototype, 6 for the second prototype and 8 for final product. Follow-up tests were conducted to evaluate pairwise differences among the three groups. The results of these tests indicated a significant difference between prototype 1 and final product ($p = 0.005$) in the pretest. No other differences were statistically significant with the items related to the experience construct in the pretest.

There was also a significant difference between the posttest scores of the items related to 'experience' construct in different cycles, $\chi^2(2, N = 44) = 12.300$, $p = 0.002$), with a median of 11.5 for the first prototype, 4 for the second prototype and 4 for final product. The pairwise comparison showed that participants' scores in final product were significantly different from those of prototype 1 ($p = 0.002$). No other differences were statistically significant with the items related to the experience construct in the posttest.

Table 4. 40

Descriptive Statistics for Experience Construct

Group	n	Mean (Pre/Post)	SD (Pre/Post)	Mean Rank (Pre/Post)
Prototype 1	8	5/8	1.93/2.33	11.63/34.69
Prototype 2	11	6.18/5.82	1.54/1.54	18.86/25.45
Final Product	25	7.56/4.68	1.69/1.41	27.58/17.30

The pretest scores of the items related to 'learning opportunities' construct were observed to be significantly different in different cycles, $\chi^2(2, N = 44) = 21.971$, $p = 0.000$), with a median of 9 for the first prototype, 6 for the second prototype and 5 for final product. A pairwise post-hoc Dunn test was significant for prototype 2 vs. prototype 1 ($p = 0.000$) and final product vs. prototype 1 ($p = .003$).

The posttest scores of the same construct, learning opportunities, were also significantly different in different cycles, $\chi^2(2, N = 44) = 23.927$, $p = 0.000$), with a median of 11.5 for the first prototype, 5 for the second prototype and 13 for final product. Pairwise comparison of all three cycles showed significant difference for prototype 2 vs. prototype 1 ($p = .018$) and final product vs. prototype 2 ($p = 0.000$).

Table 4. 41

Descriptive Statistics for Learning Opportunities Construct

Group	n	Mean (Pre/Post)	SD (Pre/Post)	Mean Rank (Pre/Post)
Prototype 1	8	10.88/11	2.95/4.50	38.94/23
Prototype 2	11	3.36/4.55	1.03/1.81	11.64/6.68
Final Product	25	5.04/13.08	1.77/3.13	22.02/29.30

Another significant difference was observed in the pretest scores of the items related to 'behavioral intention' construct , $\chi^2(2, N = 44) = 18.502$, $p = 0.000$), with a median of 4 for the first prototype, 8 for the second prototype and 9 for final product. Pairwise comparisons using Dunn's test indicated that participants' scores in prototype 1 were significantly different from those of prototype 2 ($p = 0.007$) and final product ($p = 0.000$).

The last significant difference was observed in the posttest scores of the items related 'behavioral intention' construct, $\chi^2(2, N = 44) = 9.197$, $p = 0.010$), with a median of 6 for the first prototype, 2 for the second prototype and 4 for final product. The pairwise comparison showed that participants' scores in prototype 1 were significantly

different from those of prototype 2 ($p = 0.011$). No other differences were statistically significant with the items related to the behavioral intention construct in the posttest.

Table 4. 42

Descriptive Statistics for Behavioral Intention Construct

Group	n	Mean (Pre/Post)	SD (Pre/Post)	Mean Rank (Pre/Post)
Prototype 1	8	3.88/5.63	1.55/2.39	5.69/30.31
Prototype 2	11	7.91/3.09	1.92/1.30	23.45/13.45
Final Product	25	8.60/4.56	1.50/1.61	27.46/23.98

A Kruskal-Wallis test was conducted to determine whether there is a significant difference in the pretest and posttest scores of the items related to the other 2 constructs in the questionnaire, usefulness and curriculum relatedness. The results of the usefulness construct indicated non-significant difference in pretest, $\chi^2(2, N = 44) = 0.968$, $p = 0.616$), with a median of 10.5 for the first prototype, 11 for the second prototype and 12 for final product. The posttest scores of the same construct were also not significant, $\chi^2(2, N = 44) = 3.517$, $p = 0.172$), with a median of 12.5 for the first prototype, 13 for the second prototype and 11 for final product. We can conclude that there is no significant difference between the perception scores in usefulness construct in different cycles.

The results of the curriculum relatedness construct also indicated non-significant difference in pretest, $\chi^2(2, N = 44) = 4.415$, $p = 0.110$), with a median of 6 for the first prototype, 10 for the second prototype and 8 for final product. The posttest scores of the same construct were not significant either, $\chi^2(2, N = 44) = 3.821$, $p = 0.148$), with a median of 5.5 for the first prototype, 4 for the second prototype and 4 for final product. We can conclude that there is no significant difference between the perception scores in curriculum relatedness construct in different cycles.

4.4.3 Comparison of the Results of Achievement Test

The achievement test consisted of 20 questions. A Kruskal-Wallis test was conducted to compare all three cycles (prototype 1, prototype 2 and final product) and to determine if there are statistically significant differences between the groups.

The pretest scores of the achievement test showed that there was no statistically significant difference between the groups, $\chi^2(2, N = 442 = 2.992 , p = 0.224)$, with a median of 10.50 for the first prototype, 9 for the second prototype and 7 for final product. The posttest scores of the achievement test was also not significantly different in different cycles, $\chi^2(2, N = 42) = 1.404 , p = 0.496)$, with a median of 15.5 for the first prototype, 18 for the second prototype and 15 for final product.

Table 4. 43

Descriptive Statistics for the Achievement Test

Group	n	Mean (Pre/Post)	SD (Pre/Post)	Mean Rank (Pre/Post)
Prototype 1	8	9.83/15.33	2.78/2.34	28.08/19.83
Prototype 2	11	8.45/16.55	3.75/2.58	23.41/25.23
Final Product	25	6.92/15.32	3.95/2.67	19.08/20.26

4.4.4 Comparison of the Results of Lesson Plan Assessment

Lesson plans were assessed with a holistic rubric (Appendix E) and participants' achievement of the task was determined by giving a overall score out of 4. In the first prototype, none of the participants were able to get a full score. The lesson plan task was redeveloped after taking feedback from the participants of the first prototype and these statistics changed in the other cycles with 67% of the participants in the second prototype and 85% of the participants in the final product getting full score. In the final product implementation, none of the participants received 1 point, which means that

all the participants in final product were able to apply at least some of the components of PCaRD model in their lesson plans.

Table 4. 44

Lesson Plan Assessment Scores of Participants in All Cycles

Score	Prototype 1 (N = 4)		Prototype 2 (N = 9)		Final Product (N = 20)	
	n	%	n	%	n	%
4	-	-	6	67	17	85
3	1	25	1	11	2	10
2	2	50	1	11	1	5
1	1	25	1	11	-	-

4.5 Summary of the Results

In this chapter, both quantitative and qualitative data were analyzed, and results were presented for each cycle (prototype 1, prototype 2 and final product) according to the research questions. Major findings of the study are summarized below.

4.5.1 Prototype 1

The first research question aimed to explore the perceptions of the language instructors towards the mTPD course on DGELL in three different aspects: content, usability, and effectiveness of the mTPD course.

Regarding the content, quantitative analysis results showed that most of the teachers were satisfied with the course content including videos, warm-up tasks, check your progress part and the try-out tasks. The most prominent dissatisfaction teachers had with the content turned out to be discussion forums.

Qualitative analysis of teachers' perceptions regarding the content provided two themes: satisfaction and suggestion. Satisfaction theme represented the findings about how satisfied language teachers were regarding the content of the mTPD course. There were seven subthemes: course content fulfilled my expectations, satisfaction with the depth of content, satisfaction with multiple content types and formats, satisfaction with clear and effective instructions, satisfaction with warm-up tasks, satisfaction with the videos and satisfaction with extra materials. Suggestion theme highlighted language teachers' suggestions about the content of the mTPD course. There were two subthemes: need for support in creating a new lesson plan and different type of game may be added.

Regarding the usability of the mTPD course, quantitative analysis results showed that most of the participants were content with the functionality of the course, but half of the participants were hesitant about the easiness of the course interface. Qualitative analysis findings provided two main themes: challenges and suggestions. First theme identified the challenges of the mTPD course perceived by the participants in terms of usability. There were four subthemes in this theme: screen size could be limiting, concentration is difficult due to mobility, difficulty to correct typos on mobile devices and sharing homework on mobile devices was not easy. Second theme represented the suggestions towards the improvement of the mTPD course in terms of its usability. There were two subthemes: course navigation could be improved and sentences in some questions could be shortened.

Regarding the effectiveness of the mTPD course, quantitative analysis findings showed that half of the participants were thinking about taking another mTPD course in the future. Most participants stated that they learned as much information as they would in an in-person TPD course and they would prefer mTPD courses to in-person courses Most participants also agreed that mobile learning is a productive and convenient approach for TPD programs. Qualitative analysis findings provided two themes related to the effectiveness of the mTPD course: benefits and suggestions. First theme identified the perceptions of participants about the benefits they gained through the mTPD course. There were seven subthemes under this theme: learning anytime

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and anywhere is possible due to mobility, enabled autonomous learning, enabled realization of using digital games as authentic learning sources, prompted a way to reach students, enabled the application of theory into practice, provided an effective guideline and provided information and know-how from the experts in their fields. Second theme identified the suggestions that the participants shared with the researcher to contribute to the effectiveness of the mTPD course. There were four subthemes: need for feedback about course progress, target group of the mTPD course, need for more time and need for providing cooperation.

The second research question investigated the change in language instructors' perceptions about the use of digital games in language learning after the implementation of mTPD course. Results of the analysis indicated that there was no significant change in participants' perceptions regarding DGELL after the mTPD course.

The third research question investigated how much the mTPD course on DGELL contributed to participants' knowledge on DGELL in theory and practice. The results of the achievement test indicated a significant change, which can be concluded that participants' achievement increased significantly after taking the mTPD course. At the end of unit 3 in the mTPD course, participants were expected to create a lesson plan which was supposed to include multiple aspects of their pedagogical content knowledge on DGELL. Among four participants who submitted their lesson plans, none of the participants were able to get a full score. There was one participant who showed a considerable understanding of the subject matter in practice. Two participants executed the components of PCaRD model in their lesson plans partially and they developed few activities relevant to the phases of the lesson. One participant got the lowest score (1) because she didn't include the components of PCaRD model in her lesson plan and she developed the activities with limited understanding of DGELL.

4.5.2 Prototype 2

The first research question investigated the perceptions of participants about the content, usability, and effectiveness of the mTPD course on DGELL. Regarding the content of the mTPD course, findings from the quantitative data analysis showed that most of the participants were satisfied with the content of warm-up tasks, video lectures, articles, achievement tests, try-out tasks and rubrics in the mTPD course. As in the first prototype, participants of the second prototype implementation shared controversial opinions about the discussion forums. There were some participants who stated that discussion forums didn't help them learn other people's opinions about the subject matter.

Findings from the interviews related to the content of the mTPD course showed two themes: satisfaction and suggestions. There were nine subthemes under the satisfaction theme: course content fulfilled my expectations, satisfaction with content sequencing, satisfaction with the depth of content, satisfaction with clear and effective instructions, satisfaction with the program objectives, satisfaction with warm-up tasks, satisfaction with the videos, satisfaction with try-out task and satisfaction with check your progress part. There were three subthemes under the suggestions theme: need for more input while teaching new content, need for support in creating a new lesson plan and a different type of game may be added.

Regarding the usability of the mTPD course, most of the participants expressed positive opinions about the easiness of the course interface while there were still some participants who were hesitant about the easiness of the mTPD course. All participants were satisfied with the functionality of the program. The interviews provided two themes: challenges and suggestions. First included two subthemes: screen size could be limiting and difficulty to download game because of device requirements. There was only one subtheme under the suggestions theme: course navigation could be improved.

Regarding the effectiveness of the mTPD course, all participants stated that they learned as much as they would in an in-person TPD course, and they were thinking about taking another mTPD course in the future. Most of the participants stated that they preferred mTPD courses to in-person courses. Qualitative analysis provided two themes: benefits and suggestions. There were seven subthemes under benefits themes: learning anytime and anywhere is possible due to mobility, enabled autonomous learning, enabled realization of using digital games as authentic learning sources, prompted a way to reach students, enabled the application of theory into practice, provided information and know-how from the experts in their fields, enriched pedagogical knowledge and learning anytime and anywhere is possible due to mobility. Suggestions included are three subthemes: target group of the mTPD course, need for more time and need for providing cooperation. Each subtheme is explained with examples.

The second research question investigated the change in language instructors' perceptions about the use of digital games in language learning after the implementation of mTPD course. Results of the analysis showed that perception scores of participants about the ease of use of digital games in teaching were also significantly lower in posttest than in pretest. Perception scores of participants about the ease of use of digital games in teaching were also significantly lower in posttest than in pretest. The change in the other constructs were found to be insignificant according to the analysis.

The third research question aimed to investigate how much the mTPD course on DGELL contributed to participants' knowledge on DGELL in theory and practice. The achievement tests results indicated a significant change in the pretest and in posttest and participants' knowledge about DGELL increased significantly after taking the mTPD course. At the end of unit 3 in the mTPD course, participants were expected to create a lesson plan which was supposed to include multiple aspects of their pedagogical content knowledge on DGELL. Most of the participants were able to demonstrate a complete or considerable understanding of the DGELL and use all the phases of PCaRD model consistently.

4.5.3 Final Product

The first research question investigated the perceptions of participants about the content, usability, and effectiveness of the mTPD course on DGELL. Regarding the content of the mTPD course, most of the participants expressed positive opinions about each content area including the discussion forums. Thematic analysis findings provided two themes: satisfaction and suggestions. There were nine subthemes under satisfaction theme: fulfilled my expectations, satisfaction with content sequencing, satisfaction with the depth of content, satisfaction with multiple content types and formats, satisfaction with clear and effective instructions, satisfaction with warm-up tasks, satisfaction with the videos and satisfaction with check your progress part. There was one significant suggestion received from the interviewees regarding the content of the final product. Three interviewees highlighted the need for more input while teaching new content.

Regarding the usability of the mTPD course, most of the participants expressed positive perceptions about the easiness of the course interface and its functionality. Challenges and suggestions were two themes that were provided from the analysis of the interview data about usability in final product. Due to the revisions made in first and second prototypes, participants experienced only one significant challenge about screen size. There was also one suggestion from one interviewee regarding the lack of transcripts in the video sections.

Regarding the effectiveness of the mTPD course, most of the participants acknowledged that they learned as much as they would in an in-person TPD course. Half of the participants stated that they preferred mTPD courses to in-person courses and more than half of the participants stated that they wanted to take another mTPD course in the future. Two main themes emerged from the thematic analysis of the interviews: benefits and suggestions. There were eight subthemes under the satisfaction theme: learning anytime and anywhere is possible due to mobility, enabled autonomous learning, enabled realization of using digital games as authentic learning sources, prompted a way to reach students, enabled the application of theory into

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practice, provided an effective guideline, enriched pedagogical knowledge, and made connections to the other teachers. Suggestions theme included two subthemes: need for feedback about course progress and target group of the mTPD course.

The second research question investigated the change in language instructors' perceptions about the use of digital games in language learning after the implementation of mTPD course. Results of the quantitative analysis indicated two significant findings. First, perception scores of participants about the ease of use of digital games in teaching were significantly lower in posttest than in pretest. Secondly, perceptions of participants about the learning opportunities of digital games changed significantly in pretest and in posttest. The change in the other constructs were found to be insignificant according to the analysis.

The third research question aimed to investigate how much the mTPD course on DGELL contributed to participants' knowledge on DGELL in theory and practice. The results of the achievement test indicated a significant change in the pretest and in posttest. We can conclude from this finding that participants' knowledge on DGELL improved significantly after taking the mTPD course. At the end of unit 3 in the mTPD course, participants were expected to create a lesson plan which was supposed to include multiple aspects of their pedagogical content knowledge on DGELL.

Most of the participants were able to demonstrate a complete or considerable understanding of the DGELL and use all the phases of PCaRD model consistently. Only one participant executed the components of PCaRD model in their lesson plan partially and developed the phases of the model inconsistently.

4.5.4 Summary of Comparison of Different Cycles

Perceptions of participants about the content of the mTPD course changed positively as the program was being redeveloped in iterative cycles. On the other hand, participants in the final product thought discussion forums helped them learn other

people's opinions about the subject, while participants in the prototypes were not sure about this statement.

As the usability features of the mTPD course were being developed, the perceptions of participants changed positively in each iterative cycle. Additionally, participants in the first and second prototype had problems using discussion forums to communicate with other learners but in the final product implementation, participants thought they were able to communicate with their peers in discussion forums easily.

Most of the participants thought they learned as much information as they would in an in-person TPD course. Additionally, they also thought mobile learning is a productive and convenient approach for TPD programs. However, participants were not sure if they would prefer mTPD courses to in-person TPD courses.

The using digital games in teaching questionnaire also showed some findings. The pretest scores of 'ease-of-use' construct showed that there was a statistically significant difference between the groups. Scores in prototype 1 were significantly different from those of final product. No other differences were statistically significant with the items related to the ease-of-use construct in the pretest. The posttest scores of the 'ease-of-use' construct also showed significant difference for the first prototype, for the second prototype and for final product. Participants' scores in prototype 2 were significantly different from those of prototype 1 and final product.

The results of the items related to the 'experience' construct in the pretest indicated significant difference in different cycles. The results indicated a significant difference between prototype 1 and final product in the pretest. No other differences were statistically significant with the items related to the experience construct in the pretest. There was also a significant difference between the posttest scores of the items related to 'experience' construct in different cycles. Participants' scores in final product were significantly different from those of prototype 1.

The pretest scores of the items related to 'learning opportunities' construct were observed to be significantly different in different cycles. The results were significant for prototype 2 vs. prototype 1 and final product vs. prototype 1. The posttest scores of the same construct, learning opportunities, were also significantly different in different cycles. Pairwise comparison of all three cycles showed significant difference for prototype 2 vs. prototype 1 and final product vs. prototype 2.

Another significant difference was observed in the pretest scores of the items related to 'behavioral intention' construct. Participants' scores in prototype 1 were significantly different from those of prototype 2 and final product. The last significant difference was observed in the posttest scores of the items related 'behavioral intention' construct. Participants' scores in prototype 1 were significantly different from those of prototype 2.

The pretest scores of the achievement test showed that there was no statistically significant difference between the groups. The posttest scores of the achievement test were also not significantly different in different cycles.

The lesson plan task was redeveloped after taking feedback from the participants of the first prototype and these statistics changed upwards in the other cycles. In the final product implementation, none of the participants received 1 point, which means that all the participants in final product were able to apply at least some of the components of PCaRD model in their lesson plans

CHAPTER 5

DISCUSSION AND CONCLUSION

The purpose of the present study was to develop a mobile teacher professional development course on Digital Game-Enhanced Language Learning and evaluate this course by investigating language instructors' perceptions about the mTPD course and their perceptions and knowledge about DGELL. In this chapter, major results of the study will be discussed and implications for practice and for further studies will be presented.

5.1 Discussion of Findings

This study employed design and development research design. In DDR studies, the design, development, and evaluation phases of the study are explained in detail and the product is developed in multiple iterations in a cyclic process. The design and development phases of the study were explained in detail in Chapter 3. At the end of each iteration, a comprehensive evaluation of changes in participants' knowledge and their perceptions after the implementation of the mTPD program was performed and findings of these evaluations were presented in Chapter 4. In this section, we are going to discuss the results according to the research questions.

5.1.1 Perceptions of the language instructors towards the mTPD course on DGELL

This section is divided into three parts. In the first part, participants' perceptions about the content of the mTPD course are discussed in the light of the literature. In the second part, perceptions of the participants about the usability of the mTPD course is

discussed. Participants' perceptions about the effectiveness of the mTPD course is discussed in the last part.

5.1.1.1 Perceptions of the language instructors about the content of the mTPD course on DGELL

To engage learners actively with the course, it is important to develop a reasonable set of content that are relevant to the subject of the course and appeal to learners' needs. One of the key dimensions of IPAC mobile framework, authenticity, proposes that mobile learning activities should include rich and contextual content which enables a situated learning environment (Kearney et al., 2012). Koenraad (2019) stated that mobile learning pedagogies support authenticity through setting, task, and tool. Physical and virtual authentic settings help learners learn the new content in an immersed learning context. Task authenticity refers to the realistic tasks which include real-life problems encountered by the teachers. Tool authenticity is related to the authentic apps and learning tools learners use. Course content in this mTPD course mirrors these authenticity features by involving a virtual learning setting and various informational tasks such as warm-up tasks, video lectures, written lectures, lecture tasks, try-out tasks, discussion forum and achievement test.

Participants were also asked to evaluate the importance of each content separately and it was found out that there was not a big difference between the perceptions of participants in different cycles except for the warm-up activities. In the first prototype, participants remained indecisive when they were asked if warm-up activities were important; however, in the second prototype and final product, participants stated that warm-up activities were important. Furthermore, participants regarded video lectures, written lectures, lecture tasks, try-out tasks, and achievement tests as important. When participants were asked to evaluate the content in terms of quality, similar results were observed for each cycle. All participants in each cycle stated that the content was given in a clear and logical order, and that the video lectures, written lectures, and try-out tasks helped them learn. Participants also evaluated the achievement tests and stated that achievement tests were prepared well enough to assess their learning.

Results from the interview data were also in congruent with the data provided by the course evaluation questionnaire. In all cycles, participants stated that the content of the course met their expectations, and they were satisfied with the fact that course content was given in a logical order with multiple content types and formats. There were different kinds of learning sources such as videos and articles in the professional development program. The aim of using multiple sources was to help teachers access different types of materials and eventually deepen their learning and understanding (Smylie, 1989). The variety of the learning sources also extends learner autonomy where learners are given the opportunity to make decisions about their learning (Little, 2007). They can learn the topic either by watching expert videos, read articles, access extra sources, or make their own research online.

Discussion forums were the only content with a score above two regarding the importance of the content. In other words, discussion forums were the only course component that participants were indecisive in all cycles about their importance in a course content. However, despite participants' hesitation in terms of its importance, when they were asked to evaluate the quality of the discussion forums in the mTPD course, it was observed that their views changed positively in the final product. Participants were indecisive in the first two prototypes as to whether they were able to learn from other people's opinions in discussion forums, but in the final product, participants thought that they were able to learn from each other by interacting with other learners in the discussion forums. This result from the questionnaire was supported by interview data. In the first two prototypes, participants verbally stated that they could not use the discussion forums effectively. However, unlike the first 2 prototypes, in the final product, participants stated that they used the discussion forums constantly and they learned new things from other people's posts – hence they had less anxiety. There are a few explanations for this result. In the first prototype, discussion forums were included in the program, and learners were expected to discuss on a given question with their peers asynchronously; however, no technique was applied to encourage participation. In the second prototype, discussion forums were replaced with 'Ask your questions here' sections based on the feedback from the participants in the first prototype. Since these sections were not used effectively by the participants

in either prototype, discussion forums in the final product were encouraged to be used more interactively by using techniques that provoke interaction (Andresen, 2009). A participation assessment rubric was included to the discussion forums in each unit. Learners were also allowed to use their first language (Turkish) to participate in the discussions. In addition to those, learners were expected to post at least one question or comment, and they were expected to respond substantively to at least one other post (Smith, 2008; Solan & Linardopoulos, 2011). Owing to these improvements, the changes made in the final product to encourage and increase the participation of participants in the discussion forums worked effectively.

Effective teacher professional development programs provide continuous support for teachers and let teachers reflect on their experiences with the content of the program (Darling-Hammond et al., 2017; Mcaleavy et al., 2018). In our study, during the interviews held after prototype implementations, participants stated that they needed more support and guidance in the lesson plan preparation activity. In asynchronous learning environments, since learners are expected to engage with the learning materials independently, at their own pace, they don't have an opportunity to collaborate with their peers continuously, ask questions on the spot and request help when needed (Dede et al., 2009). Based on the language teacher education models proposed by Wallace (1991), it can be remarked that an effective teacher professional development program should provide opportunities to apply the theoretical information in practical activities (theory-to-practice model), to get support and guidance from the experienced practitioners (apprenticeship model) and to reflect on their experience about the practical activities (reflective model). In the prototype implementations of this study, participants had opportunities to apply the new information into practice; however, they wanted to get more support from the expert regarding the lesson plan activity and ask their questions about how to create their lesson plans. To support participants in lesson planning, the researcher made two different improvements in the program before proceeding to the implementation of the final product. First, sample lesson plans were diversified, and more lesson plans based on different language skills were added to the program. By doing so, the researcher aimed to give participants the opportunity to internalize the phases of a lesson plan on

digital games. In their study, Lim et al. (2018) suggested three different approaches to lesson planning, which are modification, synthesis and creation. They asserted that teachers could prepare lesson plans based on their own methods, but they found out that their participants produced effective lesson plans when they modified a preexisting lesson plan. The participants in our study didn't have enough experience to internalize digital game lesson practices; that's why they were given multiple sample lesson plans in different language skills to help them understand what they were supposed to do in their lesson plans. Secondly, in the third week of the program before the participants started the lesson plan activity, a synchronous live session was held with the participants to answer their questions related to the task. Despite its opportunities to communicate anytime anywhere and foster deep learning, asynchronous learning settings might cause frustrations for learners who need real-time conversations and receive feedback about their performance (Lowenthal et al., 2017). After the improvements, the participants in the final product stated that they did not experience any problems in this regard.

5.1.1.2 Perceptions of the language instructors about the usability of the mTPD course on DGELL

Perceptions of the participants changed positively in each implementation in terms of usability. For example, in the first and second prototypes, participants thought that the course interface was not very easy to use. This feedback was also verbally expressed by the participants in the interviews. They stated that they had problems in going back to where they left when they exited the application or seeing where they would find the answers to the achievement test questions. Although this problem was mainly related to the Schoology application, some changes were made before starting the final product implementation to maintain ease of use in the course. For example, to help learners navigate their way through the menus easily, a course map was added into the course, which included a visual diagram of all the content in each unit. In addition, instructions in the achievement test sections were revised so that participants could easily access their test scores and answers in the achievement tests. As a result of these improvements, participants did not express a negative opinion on this issue in the final

product implementation.

Owing to the improvements made in each cycle, none of the problems that the participants encountered in the prototypes were encountered in the final product implementation, except for one. In terms of usability, the only problem mentioned by the participants in all cycles was the challenge experienced due to the small screen of mobile devices. This finding is consistent with other research which identified working on small screens of mobile devices as a usability limitation (Corlett et al., 2005; Jacob & Issac, 2014; Krämer, 2005). Jacob and Issac (2014) reported that it was very difficult to read large chunks of data on small screens and browse in the menus. To eliminate this limitation of mobile devices, Corlett et al. (2005) recommended using mobile devices with larger screens, as well as optimizing the format of the course by allowing learners to annotate, save and share their notes. They also stated that search and zoom functions of the course interface can reduce usability problems while working with large sized content on a small screen. Participants in this study reported that drag and drop activities were difficult to do, it was unpleasant to read articles and formatting their lesson plans was a big challenge on small screens of mobile phones. Because of this fact, some participants switched to laptop computers to minimize this problem. Curtis and Cranmer (2014) reported similar findings in their study. Even though students found mobility and convenience important factors to use tablets or smartphones in their learning, they reported that they needed laptop with appropriate software to write their reports without having an eyestrain.

The challenges that teachers experienced regarding the usability of the mTPD course could be attributed to teachers' acceptance of new technologies. Cheok and Wong (2015) refers to Technology Acceptance Model and states that one of the important factors that provides teachers' acceptance of online courses for teaching is how easy to use a new technology is. The Technology Acceptance Model (TAM), introduced by Davis (1989), suggests that when a new technological tool is presented to the users, the perceived usefulness and perceived ease of use of the product affect users' responses towards these technologies. Because of this reason, it is important to take both the technological and psychological factors into consideration when investigating

teachers' perceptions about such technologies (Holden & Rada, 2011). Liu et al. (2019) identified the factors that affect teachers' technology acceptance as knowledge, experience, and social influence. As teachers gain more knowledge and experience in new technologies, they can feel more comfortable in using new technologies in their classroom practices. Their acceptance of new technologies can also create a social influence on other teachers and change their intention to use new technologies (Ikhsan & Sunaryo, 2020).

5.1.1.3 Perceptions of the language instructors about the effectiveness of the mTPD course on DGELL

The data obtained from the participants through the course evaluation questionnaire about the effectiveness of the mTPD course showed that participants in the second prototype were more willing to participate in future mobile TPD courses than the participants in prototype 1 and final product. The questionnaire results in all cycles also showed that participants were still indecisive about preferring mobile professional development programs to in-person professional development programs. The literature identified some of the challenges that might explain this finding. One reason might be the need for teachers to receive technical and material support when necessary (Burston, 2014). During the trainings, some participants complained about the technical difficulties such as downloading the game or sharing their homework on Google Drive. In their study, Shohel and Power (2010) overcame this problem with the experts who had regular visits to the schools to assist the teachers and provided online technical support. In our context, this problem was tried to be handled by offering remote assistance 24/7 on different platforms such as WhatsApp, voice call, texting, or Schoology messaging system.

Participants might also have had challenges in integrating mobile learning in their own learning (Foulger et al., 2013). Most of them have traditional methods of studying, like studying in a quiet atmosphere organizing their workplace in a specific time and place. These learners might have had problems adapting their studying habits to the mobile learning context. Some researchers also mentioned about the challenge of accessibility

of mobile devices in learning. For example, Gado, et al. (2006) stated that teachers' and learners' problems in accessing mobile devices prevents them from a learning opportunity that supports ubiquitous and collaborated context coordinated with multiple resources.

However, despite their indecisiveness about preferring mTPD programs to in-person TPD programs, participants in all cycles stated that they learned as much information from this mTPD course as an in-person TPD course and that mobile learning is a convenient approach for TPD programs. This finding was also congruent with the previous research (Keskin & Kuzu, 2015; Li et al., 2014; Swaffield et al., 2013). Adopting an innovative method for learning is a challenging process for teachers. They might even have a resistance to changing their habits and adopting technology. However, they can change their habits towards mTPD programs in time on the condition that they feel comfortable using technology and they are motivated and supported to participate in the mobile TPD as much as possible (Donovan, et al., 2007).

In the interviews conducted for a deeper understanding of the information obtained from the questionnaires, interviewees reported critical information that enhanced the information collected from quantitative results. In all cycles, participants stated that being able to open and watch videos on their mobile phones when they were mobile or to read and reply to a post in the discussion forum allowed for flexibility and availability regardless of where they were or what they were doing. These findings are consistent with those of other studies and suggest that professional development programs leveraged with mobile learning opportunities provide teachers with the opportunity to access and learn information anytime and anywhere they like (Alawani & Singh, 2017; Curran et al., 2019; Kearney & Maher, 2019; Mitchell & Reushle, 2013).

Covid-19 has brought unprecedented challenges to people's lives. Working people have had to migrate to a new way of routine in creative and bold ways to balance their personal and professional lives. Teachers had to adapt to unexpected conditions in their private and professional life; trying to work from home synchronously and

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asynchronously, while also being challenged to establish an order in their home routine. Under these circumstances, they are pleased with weaving professional development into their daily activities not limited to any place or time. This finding corroborates the ideas of Brown et al. (2021), who proposed a virtual teacher professional development model during Covid 19 pandemic, which included professional learning communities, personal coaching and self-reflection. They asserted that these online methods provide accessibility and build community while at the same time meeting professional development needs of teachers with various learning resources.

Another issue that participants in all cycles agreed on the benefits of this course was teacher autonomy. Learning autonomy means taking charge of your own learning, studying at your own pace and choosing time and place to conduct learning (Little, 2007); however, autonomy is a broader concept when it comes to teachers. According to Yazıcı (2016), teachers can develop autonomy by planning and practicing teaching, joining in administrative practices and participating in professional development activities. In this mTPD course, participants were able to control their own learning by taking decisions according to their situations and the mTPD course gave them the opportunity to develop their professional skills, which eventually led to teacher autonomy. Some participants reported that they would normally experience anxiety in an in-person TPD course because of their fear of making mistakes when they were with other teachers. However, with this course, there were some participants who reported that they had less anxiety than they would in an in-person TPD course.

Participants in all cycles remarked that they realized the potential of using digital games as authentic learning sources after taking this mTPD course. Participants who were not interested in games particularly stated that they had had prejudices about using digital games in language teaching before starting this mTPD course. However, after learning the theory in this course, learning the experiences of those who already implement it, and preparing a lesson plan that they could use in their own lessons, they stated that they were no longer biased as before and that they believed that games could be used in language teaching if it was clear how digital games could be integrated into

school curriculum. This finding is in agreement with earlier studies which highlighted the usefulness of digital games as authentic learning sources (An, 2018; Chen et al., 2012; Kenny & McDaniel, 2011; Sykes, 2018; Yong et al., 2016). By playing digital games, learners construct their own knowledge with an authentic learning experience and take an active role in a real-world context virtually.

Teachers who don't experience digital games in their lives don't appreciate the potentials of these games in their teaching. Simpson and Stansberry (2008) reported some barriers that teachers have towards using digital games in the classroom, such as accountability, research-based tools and methodology, administrative support for innovation, professional collaboration, teacher preparedness and scaffolding new methodologies with existing practice. Teachers' lack of computer skills, lack of time, lack of confidence, lack of motivation, lack of technological equipment and lack of acceptance of new technologies are other reasons why teachers have prejudices towards using digital games in their teaching (Harmandaoğlu Baz, et al., 2018). However, teachers change their negative perceptions about the usefulness of digital games in their teaching when properly informed about how to integrate them into classroom learning (McNeil, 2018). The present findings regarding teachers' positive perceptions about the usefulness of digital games in teaching seem to be consistent with previous research which proposes that perceived usefulness is a significant predictor of the intention of language teachers to adopt digital games in their classrooms (Idris, et al., 2015; Dele-Ajayi, et al., 2019). Perceived usefulness is a factor that influences teachers' decision to accept a new technology according to Technology Acceptance Model (Davis, 1989). This model proposes that a teacher who perceives digital games as not useful in their teaching will be unlikely to adopt them in their teaching, while a teacher who perceives digital games as useful in their profession will be more likely to learn how to integrate them into their classroom teaching.

Participants in all cycles also stated that, students' interests are changing day by day depending on the technological innovations and they have difficulties in keeping students engaged to the classroom activities and responding to their needs and

interests. Participants stated that by the help of this mTPD course, they would be able to facilitate a more productive learning experience and boost students' motivation by using digital games in their classrooms. As more teachers embrace and employ innovative technologies in their classrooms autonomously, their pedagogical perspectives and classroom applications will change, which will eventually bridge the generation gap between teachers and students (Lisenbee, 2016).

Another benefit that participants in all cycles thought they gained was the opportunity to apply theoretical knowledge in practice. Participants stated that in some previous TPD courses they attended, only theoretical information was given, and nothing was done about practice. However, when they prepared a lesson plan as the product of this lesson, they stated that they could transfer their theoretical knowledge they learned during the lesson to a real-life situation and eventually develop a material that they could use in the classroom. The findings of the current study are consistent with those of Burke (2013)'s study, who proposed that change in teachers' skills can be achieved by giving them the opportunity to take initiative in their own growth and apply theory and research into practice by engaging them in practical learning experiences with support from the experts. Teachers can be better teachers if they are active participants of their own professional development.

The literature highlights the significance of interaction among teachers in TPD programs (Lutrick & Szabo, 2012; Sarac, 2015; Schrum & Levin, 2013). iPAC pedagogical framework of mobile learning includes 'collaboration' construct, which proposes that learners should be given opportunities to communicate with the teacher or each other and to exchange information and resources with their peers or teachers (Kearney et al., 2012). In this mTPD course, as mentioned before, participants in both prototypes stated that, there was not enough cooperation and interaction among learners in the mTPD course. As a result of the improvements made before the implementation of the final product, participants did not experience this problem in the final product implementation, and they expressed that they were able to interact with the other learners.

In the first 2 prototypes, participants did not report any benefit related to interaction, but all the interviewees in the final product implementation stated that they interacted with other learners through discussion forums. Interacting with the other learners in the discussion forums, the participants, who had been worried about their progress before, understood that they did not need to worry much when they read the comments of other learners since they all shared the same feelings. In addition, they stated that they could read the posts of other learners to the messages shared by the discussion facilitator and look at the issues from the angles they had never thought of. This result is in parallel with the 'reflective practice' model, which was first proposed by Dewey (1910). According to this model, such reflections are essential for teachers since they can develop self-awareness of themselves, while at the same time they develop an awareness of the others' perceptions, attitudes and reflections about the same concept, which eventually leads to the development of digital capabilities and possibilities that mobile technologies offer (Royle et al., 2014).

Participants had one concern about the integration of digital games in their classroom; how to integrate digital games into their fast-flowing curriculum. Teachers usually have a short amount of time they can dedicate to extra activities because there is too much content they have to cover before the semester ends. Because of this fact, teachers feel like they are rushing through their curriculum, which prevents them getting prepared to such innovative teaching methods like DGELL. During the implementation phase of all cycles, participants expressed their concerns about the challenge to shift their thinking from curriculum to actual learning process. They also added that they want to see more research-based information showing how to integrate games into their curriculum. When literature was reviewed to investigate what teachers think about integrating digital games in curriculum, it was found out that there are similarities between the perceptions of teachers found in this study and those described by Takeuchi and Vaala (2014), who surveyed 694 teachers across the United States to understand how they were using digital games in their classrooms. In their study, teachers stated that digital game integration is hard and 80% of the teachers expressed their desire to find curriculum-aligned games. Takeuchi and Vaala (2014) proposed that the challenge to integrate digital games into curriculum can be attributed to the

fact that teachers don't learn how to use digital games in their teaching via pre-service or in-service professional development programs. They tend to learn how to use them via more informal ways, such as support from other teachers or self-learning. Consequently, teachers might need more professional development experiences which include wide varieties of pedagogical strategies enhancing and facilitating integration of digital games in teaching.

5.1.2 Perceptions of language instructors about the use of digital games in language learning after the mTPD course

Digital games are effective in creating a learning environment if effectively implemented. Studies show that there is a growing interest in using digital games for learning (Godwin-Jones, 2014) and learners who play computer games for education show positive perceptions towards the games (Enayat & Haghighatpasand, 2019; Jong et al., 2008). To attune the teachers to a new technology in their teaching, it is important to understand the initial perceptions of teachers about how well this new technology fits with their existing pedagogical approach before exploring how it can promote change and development (Royle et al., 2014). Teachers often express their prejudice against using digital games in classroom and their fear of not being able to control learners in a digital game classroom (Beavis et al., 2014). Participants in this mTPD course expressed similar views during the implementations and the interviews. However, the results of this study showed that participants in final product changed their perceptions positively regarding the learning opportunities that digital games offer in classroom after the mTPD course. Chen et al. (2012) found similar results in their study. They introduced digital game-based learning to 20 pre-service teachers to change their stereotypical views towards computer games in language learning. The study showed that pre-service teachers showed very positive attitudes towards computer games, and they thought that computer games are motivating tools for second language learning. The non-significant result in both prototypes is understandable because design and development research studies involve multiple iterations to design, develop, implement and evaluate an instructional product and a single implementation is not sufficient to provide enough evidence about the

effectiveness of the product (Herrington et al., 2007).

Previous research supports language instructors' perceptions regarding the learning opportunities of digital games in language teaching. Sykes (2018) stated that digital games provide opportunities for socio-cognitive process of learning and intercultural learning. Learners have authentic experiences by engaging in rich linguistic and cultural game environment and they are able to construct their own meaning based on their experiences in a contextualized learning environment (Thorne, 2008; Godwin-Jones, 2016). They are also able to master their language skills such as listening, reading and vocabulary (Chen & Huang, 2010; Bytheway, 2015; Tsai & Tsai, 2018).

Participants in prototype 2 and final product also thought they had more skills to use digital games in their classrooms after taking the mTPD course. The mTPD course gave participants an opportunity to step out of their teaching routine and develop skills to integrate digital games into their classrooms. This is an expected outcome of a professional development activity in which teachers can constantly improve their skills and become more competent in their teaching. There are some studies in literature that aimed to improve language teachers' knowledge and competency about the use of digital games in classroom and their results matched those observed in this study (An & Cao, 2017; Charlier & De Fraine, 2012). In An and Cao (2017)'s study, teachers stated that they felt more confident about using digital games in their teaching after they learned how to design their own class using digital games for learning. Similarly, Charlier and De Fraine (2012) asserted that participants of their study significantly improved their competence in the integration of DGBLL into the classroom and this led to an increase in their self-confidence for technology use, as well as an incentive to implement DGBLL in their future careers.

The pedagogical skills that the language instructors developed in the mTPD course was to assess digital games for school content using the TPACK framework and to integrate these games into their classroom teaching using PCaRD model. Understanding the relationship between different knowledge types in the TPACK framework enabled teachers implement digital games in their teaching (Hsu et al.,

2015). The intersecting points of three main forms of knowledge; technological knowledge, pedagogical knowledge and content knowledge, were interpreted by the language teachers to form their practices with digital games in their teaching. On the other hand, the different phases of PCaRD model; play, curricular activity, reflection and discussion, provided language teachers a robust and effective structure to prepare a lesson using digital games in their classrooms (Foster & Shah, 2015). In previous studies, the need to support language teachers' digital game-enhanced pedagogical skills is highlighted by relevant literature and different strategies were employed to introduce language teachers with digital-game enhanced pedagogy. In all these studies, game-playing was the key feature of the course design (McNeil, 2018; Kuhn & Stevens, 2017; Alyaz & Genc, 2016; Becker, 2007). In addition to game-playing, reflection on teachers' experiences with digital games was another important feature of the professional development course on using digital games in teaching (McNeil, 2018; Kuhn & Stevens, 2017; Alyaz & Genc, 2016; Meletiou-Mavrotheris & Prodromou, 2016). Meletiou-Mavrotheris and Prodromou (2016) designed their professional development course on TPACK model. First, they introduced game-based learning to the teachers, and then they worked with teachers in different groups to develop lesson plans and instructional materials based on TPACK model. In the current study, a similar structure was followed by introducing the key theories such as TPACK and PCaRD first, and then letting language teachers apply their theoretical knowledge in a practical activity and reflecting on their experiences.

5.1.3 Language instructors' knowledge of DGELL at the end of mTPD course

The depth of the teacher's knowledge about the subject matter is reported to be an important factor affecting student outcomes (Snow et al., 2005); to this end, the change in participants' knowledge of DGELL was investigated in two different ways. To investigate how much the mTPD course on DGELL contributed to participants' content knowledge on DGELL, first, an achievement test was given to the participants before and after the mTPD course. The results showed that participants' knowledge on DGELL improved significantly after taking the mTPD course in all cycles. We can understand from these results that the mTPD course made a positive impact on the

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content knowledge of participants on DGELL in all cycles. When pairwise comparisons of the achievement test scores were conducted in different cycles, it was found out that participants' pretest and posttest scores of the achievement tests didn't significantly differ in prototype 1, prototype 2 and final product.

Having expert opinion, the researcher decided that employing only an achievement test to measure performance might not reflect the true picture. Achievement test results were combined with lesson plan assessment to present authentic data that more accurately reflects the learning experience of the teachers. Participants were asked to prepare a lesson plan on DGELL to understand if they were able to apply this knowledge acquired from the mTPD course in a lesson plan. Triangulating the achievement test and lesson plan assessment data helped the researcher investigate the research question from all angles to arrive at a deeper understanding.

During the first three units of the mTPD, participants were introduced the DGELL approach, and they learned how to assess digital games and integrate them into their classrooms. A variety of teaching materials and activities were provided to help them explore and deepen their understanding of the concepts. At the end of the third unit, information about lesson plan preparation, a lesson plan template and sample lesson plans were presented to the participants. Only in the final product implementation, a live session was conducted with the participants to answer their questions about the lesson plan. Afterwards, participants prepared their lesson plans on DGELL and submitted them on the course platform until the end of the course.

A holistic rubric was used to assess the lesson plans. Participants' achievement in the lesson plan task was assessed by giving an overall score out of four. In the first prototype, participants received an average score of two, which can be interpreted as participants being able to demonstrate some understanding and execution of Digital Game-Enhanced Language Learning. The lesson plan task was redeveloped in each upcoming cycle after taking feedback from the participants and the scores went upwards in the other cycles with an average score of 3.3 in the second prototype and 3.8 in the final product. In the final product implementation, none of the participants

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received one point and all the participants were able to demonstrate complete or considerable understanding and execution of Digital Game-Enhanced Language Learning in their lesson plans.

When the results of achievement test and lesson plans were interpreted together, it can be said that the mTPD course succeeded its objectives by expanding teachers' content knowledge in the targeted areas of DGELL and having them develop lesson plans on DGELL using their new knowledge. Bragg et al. (2021) reported that one of the design elements of successful online professional development practices for teachers is the application of knowledge and skills where teachers can connect and apply the new knowledge or skills to their teaching practice. The findings of this study seem to be consistent with this statement. At the initial design phase of our mTPD course, it was considered to evaluate only the content knowledge of language instructors after the mTPD course. It was then decided to investigate the outcomes of the mTPD course at multiple levels, by assessing their knowledge and application of this knowledge in a lesson plan. It is encouraging to compare this finding with that found by Kramer et al. (2012) who explored the effects of an online professional development workshop on language teachers' content knowledge and instructional practices. They discussed that it is important to focus on both content knowledge and pedagogical knowledge of teachers and offer opportunities for active learning in an effective professional development practice. In another study, Sever and Yurtseven Yılmaz (2021) produced results which corroborate the findings of this study. They investigated Turkish language teachers' views on their past professional development experiences and their expectations from professional development activities. They reported that the professional development practices they investigated in Turkey only used question-answer technique to evaluate teachers' comprehension at the end of the instruction. They suggested using a variety of methods and techniques that incorporate high-level thinking skills, which would improve teachers' pedagogical skills and increase their interest to professional development. In our study, language instructors not only extended their theoretical knowledge about using digital games in language learning but also they developed new ways of thinking about how to integrate digital games into their classroom by preparing a lesson plan.

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5.2 Implications for Practice

The main aim of this study was to develop an mTPD course on DGELL and to evaluate this course by investigating language instructors' perceptions about the mTPD course and their perceptions and knowledge about DGELL. For this purpose, this study employed Type 1 design and development research methodology. Type 1 DDR studies concentrate on a specific instructional product, and they recommend situation-specific solutions. The current study doesn't intend to offer generalizations to other contexts. Yet, other researchers who are challenged by similar design and development projects can benefit from the conclusions of this study and suggestions of this study can be used as guidelines for similar studies.

Results of this study provided some implications about using Digital Game-Enhanced Language Learning method by language teachers. This study also provided useful insights into the process of designing, developing, implementing, and evaluating mTPD programs.

In the new postmodern globalized era, teachers need to update their knowledge and refine their pedagogical skills to prepare their students for the 21st century skills and competencies (Benzehaf, 2016). This requires them to push past their usual teaching habits and routines, move out of their comfort zones to become critical of their own teaching practices and take the risk of experimenting innovative teaching methods that they are not familiar with (Riley & Solic, 2017). In this study, there were some participants who were hesitant to take the course first, but then realized that all their fears about using digital games in their teaching are fictional. Comfort zone is a safe place to be in, but language teachers should open up themselves to innovative methods of language teaching and move from comfort zone to growth zone where they can improve their skills in the areas that they are lacking.

It has been suggested that a well-structured digital game lesson can help language teachers engage students in authentic collaborative activities in foreign language classroom settings to create an alternative learning environment (De Grove et al.,

2012; Kenny & McDaniel, 2011). The findings of this study proved that language teachers are willing to use digital games in classroom settings and they should be supported with high-quality professional development programs to enhance their pedagogical skills on Digital Game-Enhanced Language Learning. This study also revealed the positive perceptions of language teachers towards using digital games in classrooms, but they have some concerns related to the integration of digital games in school curriculum. Policy makers should take this issue into consideration and employ curriculum policies to integrate digital games into school curriculum. Language teachers' needs and expectations as to using digital games in foreign language teaching should be taken into consideration by policy makers while reviewing English language learning curriculum.

The results of this study provided useful data about the perceptions of language teachers regarding the use of digital games in language teaching, but also can provide data for mobile teacher professional development programs. The fact that participants learned as much information from this mTPD course as an in-person TPD course has important implications for creating TPD opportunities leveraging mobile learning. This study showed that teachers' professional development can be supported with mTPD programs. Especially during the global Covid 10 crisis, teachers were forced to teach from their homes, and they needed alternative ways to in-person TPD to better their professional skills and develop new ones. Policy makers should take this issue into consideration and should offer mTPD trainings to the teachers; thus, the cost of in-person TPD trainings can be reduced, more teachers can reach these trainings and they can access these trainings wherever and whenever they want.

Regarding the implications related to design and development, there are some features of the program that shaped the positive attitudes of the learners towards the mTPD program. Other practitioners who are challenged by similar design and development studies can take the solutions of our specific mTPD course into consideration while designing and developing their mTPD programs. To design and develop an effective mTPD course, other practitioners can benefit from the solutions of our mTPD course design given below.

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1. Content should be relevant to the subject of the course and appeal to learners' needs.
2. Content should be in a clear and logical order to improve learners' understanding.
3. Content should include different types of various informational materials.
4. Content should be easily accessible anytime and anywhere learners want.
5. Learners should be provided an autonomous learning environment where they can take charge of their own learning and study at their own pace.
6. Learners should be provided opportunities to apply theoretical knowledge in hands-on learning experiences.
7. Interaction should be encouraged by using techniques to increase participation.
8. Learners should be provided continuous support and feedback for learner progress.
9. A detailed syllabus of the course should be provided to lay out expectations for the quality of work expected from the learners.
10. Content that might challenge learners because of the small screen size of mobile devices should be avoided.
11. Learners should be given options to switch to a larger screen if they don't have any other options.
12. Professional development in mobile learning context requires commitment; that's why mTPD courses should be optional for teachers who have the necessary motivation.
13. Course designers should consider the availability of support, the needs of content and their expertise while choosing the right mobile platform.
14. Technical constraints should be identified before starting the course to prevent problems.

5.3 Implications for Further Studies

Based on the literature review, most Digital Game Enhanced Language Learning studies focus on the learning phase, examining the effect of digital games in language learning and the perceptions of teachers and learners about using digital games in

language learning (e.g. Enayat & Haghighatpasand, 2019; Loiseau et al., 2016; Xu et al., 2019). While few studies have investigated the professional development of language teachers on using digital games in their classrooms (Kuhn & Stevens, 2017; Stieler-Hunt & Jones, 2019), future research could be conducted to investigate the best approaches for designing, developing, implementing, and evaluating teacher professional development programs on how to integrate digital games into classroom.

In addition to that, this study employed a mobile learning approach to support language teachers' professional development on DGELL. In further studies, new professional development programs can be designed and developed in other disciplines using a mobile learning approach. Royle et al. (2014) stated that the opportunities provided by mobile technologies should be adapted in teacher education, especially in continuous professional development of teachers where using mobile technologies is less prescribed by standards than initial teacher education.

Additionally, further research could be conducted to evaluate the effectiveness of this mTPD course on language teachers' technological pedagogical content knowledge. In the current study, language teachers' experiences with DGELL in their classrooms weren't included. Research on in-class experience of teachers and learners is needed and should be encouraged to make the effectiveness of this professional development program more explicit. In addition to this mTPD course, a follow-up course could be designed focusing only on hands-on activities and language teachers could be trained to develop lessons using different game genres. Encouraging language teachers to develop lessons using different digital game genres could improve teachers' experiences with digital games.

Findings of this study also indicated that teachers have concerns about how to properly integrate digital games into their school curriculum. Research could be done to investigate the integration of digital games into school curriculum in different school levels.

This is a Type 1 design and development research study that was conducted in a

contextually specific perspective. Therefore, the results of this study cannot be generalized. However, future studies can use the solutions of this study to design and develop an mTPD program on using digital games in language learning and adopt Type 2 DDR design to create and validate a unique design model. The mTPD course constructed in this study didn't have a large number of participants in the prototype implementations; therefore, more follow-up studies are needed with more prototype samples and a control group.

Finally, design and development research studies can provide opportunities to provide practical design principles in instructional technology. The focus of design and development research studies is basically not just knowledge, but knowledge practitioners can benefit from by using the data systematically obtained from the practice. Therefore, it is suggested that there should be more design and development research studies about integrating technology into learning and other topics in our field.

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A. LESSON PLAN TEMPLATE

Lesson Plan

General Information

- **Level of English:**

- **Age:**

- **Course:**

- **Duration:**

- **Game Used:**

Goals:
Learning Outcomes:
Anticipated Problems:
Before the Lesson:
Materials:

Activity	Procedure	Objectives	Time
Introduction		To scaffold the learners into the following curricular activities.	

Play (PCaRD)		To make students play the game collaboratively to engage them in Inquiry and communication (ICCE).	

Curricular Activity (P<u>Ca</u>RD)		To provide an opportunity for construction and expression (IC<u>CE</u>).	
Reflection (PCa<u>R</u>D		To get the students to actively reflect (PCa<u>R</u>D) on their experiences with the game and make them make meaningful connections between the game play, curricular activities, and their personal lives.	
Discussion (PCa<u>RD</u>		To engage them in discussions (PCaRD) where they can practice the target language.	

B. mTPD COURSE EVALUATION QUESTIONNAIRE

Genel Sorular

1. Mobil öğretmen profesyonel gelişim eğitiminiz sırasında her bir ünitede yaklaşık ne kadar süre geçirdiniz?

    A.   30 dakikadan az

    B.   30 dakika-1 saat arası

    C.   1-2 saat arası

    D.   2 saatten fazla

2. Mobil öğretmen profesyonel gelişim eğitiminiz sırasında herhangi bir bölümü atlayarak geçtiniz mi?

    A.   Evet   B. Hayır

3. Birinci soruya evet yanıtı verdiyseniz hangi bölümleri atladınız? İşaretleyiniz.

    A.   Warm-up aktiviteleri

    B.   Discover bölümlerindeki video konu anlatımları

    C.   Discover bölümlerindeki yazılı konu anlatımları

    D.   Discover bölümlerindeki ödevler

    E.   Uygulama (Try-out) bölümleri

    F.   Tartışma Forumları (Discussion forums)

    G.   Başarı testleri (Achievement tests)

4. Mobil profesyonel gelişim dersine hangi konumlardan eriştiğinizi en sık eriştiğiniz konumdan en aza doğru 1-2-3 sayılarını kullanarak yazınız.

    (1-Evde, 2-İşyerinde,   3-Hareket halindeyken (ulaşım araçlarında, seyahatte vs)

Mobil öğretmen profesyonel gelişim dersinde aşağıdaki içeriklerin bulunmasını öğrenme sürecindeki faydaları açısından değerlendiriniz.

İçeriğin Önemiyle İlgili Sorular	Çok önemli	Önemli	Kararsızım	Biraz Önemli	Onemli değil
Warm-up aktiviteleri					
Video konu anlatımları					
Yazılı konu anlatımları					

	Kesinlikle katılıyorum	Katılıyorum	Kararsızım	Katılmıyorum	Kesinlikle katılmıyorum
Konu anlatımları sonrasındaki ödevler					
Uygulama (Try-out) aktiviteleri					
Tartışma forumları					
Başarı testleri					

Aşağıdaki ifadelere ne oranda katıldığınızı işaretleyiniz.

İçeriğin Kalitesiyle İlgili Sorular	Kesinlikle katılıyorum	Katılıyorum	Kararsızım	Katılmıyorum	Kesinlikle katılmıyorum
Dersin içeriği açık ve netti.					
Dersin içeriği mantıksal bir sıralama içeriyordu.					
Dersin içeriği Dijital Oyunla Geliştirilmiş Yabancı Dil Öğrenimi konusunu anlamama katkı sağladı.					
Warm-up aktivitelerinin içerikleri öğretilen konulara uygundu.					
Video konu anlatımı içerikleri konuları anlamamı sağladı.					
Yazılı konu anlatımı içerikleri konuları anlamamı sağladı.					
Aktivite başlarındaki açıklayıcı bilgiler (rubrics) yeterliydi.					
Ders sonlarında verilen ödevler öğrenmemi pekiştirdi.					
Tartışma forumları konu hakkında başkalarının görüşlerini öğrenmemi sağladı.					
Ünite sonlarındaki başarı testleri öğrenmemi değerlendirmek için uygundu.					

Kullanılabilirlikle İlgili Sorular	Kesinlikle katılıyorum	Katılıyorum	Kararsızım	Katılmıyorum	Kesinlikle katılmıyorum
Dersteki kullanıcı ara yüzünün kullanımı kolaydı.					
Derste kullanılan videoları rahatlıkla açıp izleyebildim.					
Schoology uygulamasına rahatlıkla giriş yapabildim.					
Tüm linkler sorunsuz çalışıyor.					
Schoology uygulamasında ödevlerimi sorunsuz bir şekilde yapıp paylaşabildim.					
Tartışma forumlarında diğer öğrenenlerle kolaylıkla iletişim kurabildim.					

Dersin Etkililiğiyle İlgili Sorular	Kesinlikle katılıyorum	Katılıyorum	Kararsızım	Katılmıyorum	Kesinlikle katılmıyorum
İleride yine mobil öğretmen profesyonel gelişim eğitimi almayı düşünüyorum.					
Kullandığım bu mobil öğretmen profesyonel gelişim eğitiminden yüz yüze eğitimlerdeki kadar bilgi öğrendim.					
Mobil öğretmen profesyonel gelişim eğitimlerini yüz yüze alacağım öğretmen profesyonel gelişim eğitimlerine tercih ederim.					
Öğretmen profesyonel gelişim programları için mobil öğrenme verimli ve uygun bir yöntemdir.					

Katıldığınız mobil öğretmen profesyonel gelişim eğitimi ile ilgili başka bir değerlendirme ya da görüş bildirmek isterseniz katkınız bizi mutlu edecektir.

C. USING DIGITAL GAMES IN TEACHING QUESTIONNAIRE

Dear participant,

The purpose of this questionnaire is to learn what language instructors think about using digital games in language teaching. Below are a series of questions about your experiences and opinions about using digital games for language learning. If you choose to complete the questionnaire, all the information you supply will be held in the strictest confidence. Thank you for taking time to complete this questionnaire.

Asst. Prof. Dr. Nur Çakır (Supervisor)   Emrah Baki Başoğlu

Middle East Technical University

Department of Educational Sciences

Personal Information					
1	Gender	Female ( )	Male ( )	Other ………………	
2	Age	25 and below ( )	26-35 ( )	36-45 ( )	46-55 ( )	56 and above ( )
3	Your School					
4	Experience	0-1 year ( )	1-3 years ( )	4-10years ( )	11-15 years ( )	16 years and more ( )
5	Level of Education	Undergrad ( )	Masters ( )	PhD ( )		

TEACHERS' EXPERIENCE OF USING TECHNOLOGICAL DEVICES

6- Please read the descriptions below regarding a user's ability to use technological devices (computer, tablet, smartphone, game console). Determine the level that best describes you and choose the appropriate answer.

( )   Doesn't Know- I have no experience using technological devices.

( )   Basic – I can perform basic functions in a limited number of applications in technological devices.

( )   Moderate- I have an average proficiency in using technological devices.

( )   Advanced- I have the skills to use technological devices competently.

( )   Expert- I am extremely proficient in using a wide variety of technological devices.

7. Please indicate how often you use technology in your teaching activities.

( )   Always

( )   Often

( )   Sometimes

( )   Rarely

( )   Never

8. On average, how many hours per week do you spend using computers for personal use, other than teaching activities?

( )   Never

( )   Less than 1 hour

( )   Between 1-3 hours

( )   Between 3-5 hours

( )   Between 5-10 hours

( )   More than 10 hours

9. On average, how many hours a week do you spend playing digital games for personal use outside of teaching activities?

( )   Never

( )   Less than 1 hour

( )   Between 1-3 hours

( )   Between 3-5 hours

( )   Between 5-10 hours

( )   More than 10 hours

10. On average, how many hours a day do you spend using mobile devices (smartphone, tablet computer, e-book reader) for personal use other than teaching activities?

( )   Never

( )   Less than 1 hour

( )   Between 1-3 hours

( )   Between 3-5 hours

( )   Between 5-10 hours

( )   More than 10 hours

TEACHERS' EXPERIENCE OF USING DIGITAL GAMES IN LANGUAGE TEACHING

11. Are you currently using digital games for learning in your class?

( )   If yes, continue to question 12

( )   If no, continue to question 13

12. How often do you use digital games for learning in your classroom?

( )   Never

( )   1-2 times a week

( )   3-4 times a week

( )   Every day

13. Have you ever participated in any kind of digital game-based learning professional development in your teaching career?

( )   Yes

( )   No

TEACHERS' PERCEPTIONS ABOUT USING DIGITAL GAMES IN LANGUAGE TEACHING

		Strongly Agree	Agree	No idea	Disagree	Strongly Disagree
14	Digital games enhance the quality of my job.	( )	( )	( )	( )	( )
15	Digital games in my job increases my productivity.	( )	( )	( )	( )	( )
16	Digital games enhance my effectiveness in my job.	( )	( )	( )	( )	( )
17	I find digital games to be useful in my job.	( )	( )	( )	( )	( )
18	Using digital games makes teaching easy.	( )	( )	( )	( )	( )
19	I know how to use digital games in classroom setting.	( )	( )	( )	( )	( )
20	I have the necessary skills to use digital games in a classroom setting.	( )	( )	( )	( )	( )
21	I have used digital games before in the classroom.	( )	( )	( )	( )	( )
22	I have experience with the use of digital games in the classroom.	( )	( )	( )	( )	( )
23	Digital games offer opportunities to experiment with knowledge.	( )	( )	( )	( )	( )

24	Digital games offer opportunities to take control over the learning process.	( )	( )	( )	( )	( )
25	Digital games offer opportunities to experience things you learn about.	( )	( )	( )	( )	( )
26	Digital games offer opportunities to stimulate transfer between various subjects.	( )	( )	( )	( )	( )
27	Digital games offer opportunities to think critically.	( )	( )	( )	( )	( )
28	Digital games offer opportunities to motivate students.	( )	( )	( )	( )	( )
29	Digital games fit the curriculum.	( )	( )	( )	( )	( )
30	It is clear how digital games can be used to fit the curriculum.	( )	( )	( )	( )	( )
31	I'm planning to use digital games in the classroom.	( )	( )	( )	( )	( )
32	In the future, I intend to use digital games in the classroom.	( )	( )	( )	( )	( )

D. ACHIEVEMENT TEST

1. What is the main difference between Game-Based Language Learning (GBLL) and Game-Enhanced Language Learning (GELL)?

    a. Game playing is viewed as a non-serious activity in GBLL, but it is viewed as a serious activity in GELL.

    b. GBLL is an approach to teaching which has well-defined learning outcomes but GELL incorporates the use of games for teaching without prioritizing learning outcomes.

    c. Games made for language learning are integrated in the learning process to facilitate student learning in GBLL but in GELL commercial off the shelf games are used in language learning. CORRECT

    d. In GBLL, learners are passive recipient of knowledge or unaware of the implications of what they are doing, whilst in GELL, learners are engaged as an active participant, not a passive recipient

    e. There is no difference between GBLL and GELL. Both identify the same kind of learning which balance the subject content with gameplay in a learning content.

2. In language learning, video games facilitate ……………………, which requires learners to "formulate general rules, patterns, and strategies" in order to proceed with the game; so that learners become co-designers of a game through trial-and-error.

    a. achievement of objectives

    b. inductive discovery CORRECT

    c. communicative competence

    d. flow learning

    e. deductive discovery

3. Vernacular game is a game ………………………………………………..

    a. that allows all players to simultaneously play the game in real-time and take turns to play.

    b. that combines elements of action and adventure genres, typically featuring long-term obstacles that must be overcome using a tool or item as leverage.

    c. that contains pre-filmed full motion cartoons or live-action sequences, where the player controls some of the moves of the main character.

    d. that is commercially available and is not made for any specific educational purposes. CORRECT

    e. that takes place using a real-time system that relies on the player's ability to perform particular actions with speed and accuracy to determine success.

4. According to the research about using digital games in language learning, which of the following statements CANNOT be counted as an affordance of digital games in language learning?

    a. Digital games associate form-meaning-function relationships in meaningful contexts.

    b. Digital games promote active participation of learners in the learning process.

    c. Digital games negotiate goals and actions with others using language.

    d. Digital games enable players develop learner autonomy.

    e. Digital games offer language learners a sense of escape from the reality of the world. CORRECT

5. According to the research, how do people use digital games as informal language learning resources?

    a. They play games that have useful features like subtitles, captioning, repeatability and pausability. CORRECT

    b. They ignore the technical constraints of the games they play.

    c. They play any game in their L2 regardless of any meaningful use of language.

    d. They play any digital game at a random proficiency level.

    e. They develop strong ties with the gaming community.

6. Which game genre does NOT match with its description?

    a. Action-adventure games contextualize language in progression narratives and promote goal-oriented activity

    b. Multi-player cooperative games require coordinated collaboration and role-taking.

    c. MMORPGs don't require social collaboration, cooperation and language use. CORRECT

    d. Strategy and simulation games promote planning, problem solving and systems thinking.

    e. Open world games promote story-making, creativity and imagination.

7. Which of these is NOT important to consider when choosing a game for language learning?

    a. The amount and quality of target language used in the game

    b. Play styles and preferences of the learners

    c. Up-to-dateness of the game CORRECT

    d. Target language proficiency of the learners

    e. How language is used about and around the game by the community

8. According to the research, how much proficiency of the language is expected to be able to use a digital game for language learning?

   a. % 0 – % 20

   b. % 20 – % 40

   c. % 40 – % 60

   d. % 60 – % 80 CORRECT

   e. No proficiency needed

9. If a learner is just beginning to use digital games in language learning, the best advice is to start by playing …………..

   a. advanced games such as World of Warcraft

   b. interactive fiction games such as The Sims.

   c. casual games such as LifeQuest   CORRECT

   d. shooter games which include limited language

   e. action-adventure games such as Resident Evil

10. Among several types of knowledge that would constitute the knowledge base for teaching, TPACK is built on the construct of ....

    a. content knowledge

    b. general pedagogical knowledge

    c. curriculum knowledge

    d. technological knowledge

    e. pedagogical content knowledge CORRECT

11. Technological Pedagogical Content Knowledge (TPACK) is ………………………..

    a. the knowledge of how to teach specific content with appropriate technological tools and pedagogical methods. CORRECT

    b. the subject-matter knowledge of teachers' interpretations and transformations in the context of facilitating student learning.

    c. a special kind of knowledge which combines content and pedagogy that is uniquely constructed by teachers to form professional knowing and understanding.

    d. the craft knowledge which comprises integrated knowledge representing teachers' accumulated wisdom with respect to their teaching practice.

    e. the knowledge of different information technologies that would be used in teaching and daily life.

12. Teachers should be able to transform the subject matter for teaching, such as finding multiple ways to represent materials and adapting them to meet the need of their students. This is …………………….

a. Technological knowledge

b. Technological content knowledge

c. Pedagogical content knowledge CORRECT

d. Content knowledge

e. Pedagogical knowledge

13. A well-designed game would be like a well-designed lesson from the TPACK perspective where …………………………………………..

a. the teacher has to be given the opportunity to use his technological skills.

b. the teacher should raise students' awareness on different technological tools.

c. the teacher acts as the sole designer of the tool and instantly develops authentic solutions to the technological problems.

d. the teacher has successfully identified the learning goals, picked appropriate pedagogical strategies in technologies to support learning. CORRECT

e. the teacher has to master his technological competence to support student learning

14. Among several strategies to integrate digital games in language teaching, one particular strategy that can be useful for language teachers is using ………………….

a. semantic maps

b. mind mapping

c. Frayer model

d. learning activity types (LAT) CORRECT

e. peer-tutoring

15. Which of these learning activities can be used as a during-play task if the game can't be paused while playing?

a. Vocabulary activity CORRECT

b. Discussion activity

c. Comprehension activity

d. Reflection activity

e. Story-telling activity

16. Which of the following is true for integrating digital games into language learning?

a. All game genres can be used for language learning.

b. Some learners are more receptive to gameful learning than others. CORRECT

c. It is not necessary to balance gaming with learning activities while learners play games

d. Digital games should be used only as a free time activity.

e. Digital games always require teamwork between the students.

17. What is the most important benefit of using independent projects as a DGELL activity?

    a. Independent projects help students play games as long as they want.

    b. Independent projects develop students' communication skills.

    c. Independent projects help students make choices together and collaborate.

    d. Independent projects help teachers personalize students' learning when not all the students want to play a game. CORRECT

    e. Independent projects promote teacher-student interaction and familiarity.

18. In what order do teachers use these activities while implementing PCaRD model in a digital game-enhanced language learning classroom?

    1. engaging students in reflection tasks on the curricular activities

    2. engaging students in naturalistic game-play

    3. engaging students in discussion tasks led by students and teachers to reconcile classroom-learning goals from the activities

    4. engaging students in curricular activities that are connected to game-play

        a. 3-2-4-1

        b. 1-2-4-3

        c. 2-1-3-4

        d. 4-1-2-3

        e. 2-4-1-3 CORRECT

19. Which of the following CANNOT be a reason why teachers need pedagogical models when they want to integrate digital games in their language classes?

    a. Pedagogical models help teachers become more tech savvy and develop their game playing skills, CORRECT

    b. Pedagogical models help teachers in synthesizing their content and pedagogical expertise,

    c. Pedagogical models provide teachers with the flexibility to decide the appropriate strategies to employ at each phase of implementation

    d. Pedagogical models help teachers provide a structure for integrating digital games into language learning.

    e. Pedagogical models help teachers in adapting the use of games according to the needs of their teaching contexts.

20. The three frameworks, TPACK, ICCE, and PCaRD combine to create a system which is referred to as GaNA or Game Network Analysis for ……………………..

    a. analyzing and integrating games for learning. CORRECT

    b. empowering teachers with pedagogical competence.

    c. supporting learners' personal engagement with the game activities.

d. bridging entertainment and learning when students use digital games in language learning.

e. facilitating students' critical thinking abilities.

E. LESSON PLAN ASSESSMENT RUBRIC

Score	Criteria
4 (80-100%)	Lesson plan demonstrates complete understanding and execution of Digital Game-Enhanced Language Learning. It contains all components of PCaRD model and they are accurately implemented throughout the lesson plan.
3 (60-79%)	Lesson plan demonstrates considerable understanding and execution of Digital Game-Enhanced Language Learning. At least 3 components of PCaRD model are applied but may exhibit inconsistency in terms of balance in developing the phases of the model.
2 (40-59%)	Lesson plan demonstrates some understanding and execution of Digital Game-Enhanced Language Learning. The components of PCaRD model are faintly stated, and the lesson plan is inconsistent in terms of balance in developing the phases of model.
1 (1-39%)	Lesson plan demonstrates limited understanding and execution of Digital Game-Enhanced Language Learning. The components of PCaRD model are not stated, and the lesson plan is simplistic, unoriginal, and/or not is unbalanced in developing the phases of the model.

F. INTERVIEW PROTOCOL

Merhaba. Adım Emrah Baki Başoğlu. Orta Doğu Teknik Üniversitesi Eğitim Programları ve Öğretimi bölümünde yürütmekte olduğum tez çalışması kapsamında sizinle bir görüşme yapmak istiyorum. Bu çalışmaya katkıda bulunmaya gönüllü olduğunuz için öncelikle çok teşekkür ediyorum. Bu görüşmedeki amacım kullandığınız öğretmen mesleki gelişim dersi hakkındaki düşüncelerinizi öğrenmek ve vereceğiniz dönütler yoluyla ürünü iyileştirerek gelecekte diğer öğretmenlerin de kullanımına açmaktır. Bu sebeple her türlü olumlu ve olumsuz düşüncenizi samimi bir şekilde benimle paylaşmanızı rica ediyorum. Burada konuştuğumuz her şey ve kişisel bilgileriniz gizli kalacak ve kesinlikle bu araştırma dışında başka hiçbir amaç için kullanılmayacaktır.

Eğer sizin için de bir sakıncası yoksa görüşmeyi kaydetmek istiyorum. Sizin için uygun mu?

Görüşmemiz yaklaşık 30 dakika sürecektir. Herhangi bir sorunuz olursa bana istediğiniz aşamada sorabilirsiniz.

Giriş Soruları

Adınız nedir? Kaç yaşındasınız?

Ne zaman ve nereden mezunsunuz?

Kaç yıldır İngilizce öğretiyorsunuz?

Teknolojiye karşı ilginiz var mı? Derslerde kullanıyor musunuz? Nasıl? Hangi oyunlar?

Daha önce hiç video oyunları oynadınız mı?

Genel İzlenimler

Bu dersle ilgili arkadaşlarınıza bir şey söyleyecek olsanız, ne söylersiniz?

Dersin en hoşunuza giden yönü neydi? Neden?

Sorunlar

Ders sırasında ne gibi sorunlarla karşılaştınız? Bu sorunları nasıl çözdünüz?

Eğer bu derse sıfırdan tekrar başlama şansınız olsa, neyi farklı yapardınız?

Ders Tasarımı

Bu dersin ara yüzü (font büyüklükleri, renkler, yerleşim) konusunda ne düşünüyorsunuz?

> Alt soru: Eğer bu dersin tasarımcısı olsanız, ara yüz kalitesinin artırılması için ne gibi değişiklikler önerirdiniz?

Bu dersin içeriğini kalite ve yeterlilik açısından nasıl değerlendirirsiniz?

> Alt soru: Her modülün başında verilen warm-up aktiviteleri hakkında ne düşünüyorsunuz?

> Alt soru: Derslerde kullanılan video ve metinler hakkında ne düşünüyorsunuz?

> Alt soru: Uygulama aktiviteleri konusunda ne düşünüyorsunuz?

> Alt soru: Ünite sonlarındaki değerlendirme bölümleri hakkında ne düşünüyorsunuz?

> Alt soru: Tartışma/soru sorma bölümleri hakkında ne düşünüyorsunuz?

Eğer bu dersin tasarımcısı olsanız, içeriğin daha iyi hale getirilmesi için ne gibi değişiklikler önerirdiniz?

Dersin Etkililiği Üzerine Sorular

Bu dersi almadan öncesiyle karşılaştırdığınızda bu ders sizde bir etki yarattı mı? Yarattıysa öncesi ve sonrası arasında ne gibi farklar olduğunu düşünüyorsunuz?

Sizce yabancı dil öğretmenlerinin böyle bir mobil öğretmen mesleki gelişim dersine ihtiyaçları var mı?

> Alt soru: Eğer bu ders daha fazla çalışmayla geliştirilirse, yabancı dil öğretmenlerinin ihtiyaçlarını karşılayabilir mi?

İçeriğin yüz yüze olması yerine mobil platform aracılığıyla verilmesi konusunda ne düşünüyorsunuz?

> Alt soru: Avantajları ve dezavantajları neler?

Sonuç

Eklemek istediğiniz başka bir şey var mı?

Görüşmemiz bitmiştir. Katkılarınız için tekrar teşekkür ederim.

Mobile Teacher Professional Development Course
2021 Syllabus

Date & Time: June 01 – June 30, 2021

Course Subject: Digital Game-Enhanced Language Learning

Course Platform: Schoology IOS/Android app – app.schoology.com

Instructor: Emrah Baki Başoğlu

Office hours: Online (by appointment)

Instructor Contact Information

      E-mail:

      Phone:

Required Materials for the Course

A Mobile device with internet connection (laptop, tablet or smartphone with at least 4 GB of storage

About this course

This 1-month mobile teacher professional development course offers a comprehensive introduction into Digital Game-Enhanced Language Learning and prepares you for using digital commercial off-the-shelf games in your language classes. This course focuses on developing technological pedagogical content knowledge on digital game-enhanced language learning that you are expected to acquire by the end of the course.

Learning Objectives

By the end of the course, you will be able to explain the role of digital games in language learning, identify some digital games and genres that can be used for language learning, indicate where language teachers and learners can reach out digital games for language learners, assess digital games for school content using TPACK framework and integrate digital games into classroom learning using PCaRD framework.

Program Structure

The course is divided into 4 units and each unit will be published every other 5 days. The content was developed by experts in the field of instructional technology and digital game-enhanced language learning. The first unit offers an introduction to the potential of using digital games in foreign language education and explains what digital game-enhanced language learning is. This will be followed by two units about how to choose digital games for school content and how digital games can be integrated into classroom learning. The last session includes a real-life example of

Digital Game Enhanced Language Learning in a Turkish university, which is explained by a language instructor. All the content provides you with ideas for teaching students with innovative pedagogical models. Throughout the course, a range of practical tasks were included, and you are encouraged to reflect on what you learn and to consider how you can adapt these ideas to your own students.

You will receive a grade out of 100 at the end of the course.

Course-related materials, communication, and assessment will be managed through Schoology. One of the most empowering features of this course is that you can set the pace yourself. The course includes self-guided lesson modules. Thus, you are expected to satisfy the requirements of the course on your own schedule, so long as you meet the expected deadlines.

COURSE ASSESSMENT

Your grade will be determined assessing your performance on 3 different aspects of the course: course participation, lesson plan submission and active participation into discussion forums.

Course Participation (60%)

Each content (video lecture or reading) will be given with a task. Your completion rate of these tasks in each unit will be evaluated by the instructor on an on-going basis and will be officially recorded at the conclusion of each unit. You may consult with your instructor at any time for feedback on your participation rate and for suggestions on how it might be improved. In order to receive a maximum score on the 'participation' component, you need to complete at least 85 percent of all the tasks (these tasks are limited to all module tasks and achievement tests)

Lesson Plan Submission (30%)

By the end of the course, you are expected to prepare a lesson plan based on PCaRD model. Further instructions, materials and the assessment rubric will be given in Unit 3 Try-Out section. The deadline for lesson plan submission is June 30th. The course instructor will hold a live Zoom session on June 20th to answer your questions regarding the preparation of lesson plans.

Discussion Forum Participation (10%)

There will be asynchronous discussion forum activities at the end of each unit. You are expected to actively participate in and contribute to these discussions without the instructor's calling. Specific instructions and the assessment rubric will be posted on the Schoology course.

Course outline (attached)
Course objectives (attached)

H. LESSON PLANS FOR THE mTPD COURSE

UNIT 1 – DIGITAL GAME-ENHANCED LANGUAGE LEARNING

MODULE 1

Objectives:

At the end of this module, participants will be able to;

- match some important facts about games with their explanations

- distinguish the difference between Digital Game-Enhanced Language Learning and Digital-Game Based Language Learning,

- identify the reasons why digital games are used for L2 learning,

- explain the affordances of digital games in language learning.

Warm-up (Matching activity)

Constance Steinkuehler, a professor at the University of California at Irvine, outlined 6 important facts about games and learning. Match the facts with their explanations.

FACTS	EXPLANATIONS
Games are more powerful combined with paratexts.	Examination of simulation games shows that the text surrounding games, when combined with the game, aids in improving student outcomes more than the game alone.
Games are great for language gains.	Games encourage students to communicate and provide practise in all four skills.
Content should be married to game mechanics.	Games are powerful motivators, but they function better when the learning is the playful part and not just a side note.
Co-play is better.	When kids play together, outcomes are improved by two standard deviations.
Despite popular opinions, games promote learning and discourage negative behaviors.	Regular gameplay can improve mental health as well as cognitive and social skills.
Games provide a 23 percent gain over traditional learning.	Games can increase learning outcomes by two grade levels.

Discover

- Short Article: What Is Digital Game-Enhanced Language Learning? (Reading Time: 1min 45sec)

Read the article and the answer the following question with your own words: How does Digital Game-Enhanced Language Learning differ from Digital Game-Based Language Learning?'

- Video: Why Do We Use Games for L2 Learning? - Jonathon Reinhardt (Video length: 4min 06sec)

Jonathon Reinhardt talks about why digital games are used for L2 learning. Watch the video and write five different reasons why digital games are used for L2 learning.

- Video: What Does Research Say About Using Games for L2 Learning? - Jonathon Reinhardt (Video length: 4 min 03 sec)

Jonathon Reinhardt talks about what research has found about using digital games in language learning. Watch the video and then answer the question below.

Explain what Jonathon Reinhardt means to say when he says 'Digital games can offer affordances to practice to mastery as sheltered, scaffolded spaces'.

MODULE 2 - LEARN

Objectives:

At the end of this module, participants will be able to;

- discuss various aspects of using digital games in language learning,

- identify 5 digital game genres that can be used for language learning,

- give at least 3 examples of some commercial digital games that have been investigated by researchers for L2 learning,

Warm-up

What are your views on the impact of video games on language learning? Read the statements below and decide to what extent do you agree or disagree with this statement?

1. Video games in a foreign language are considered as a type of simulated language immersion.

2. Gaming gives you a context to place your language learning in.

3. If you choose a wrong game, you can play for a very long time without improving your language skills.

4. If you are a beginner language learner, children's games might be a better option.

5. Using app store on your phone or tablet is a good way to find video games for language learning.

Videogames were a big help for Aaron when he was learning Spanish and French. Now watch the video in which he responds to the statements given above, and see if you agree with him.

https://www.youtube.com/watch?v=lHaLkz4l_GU&feature=emb_logo

Discover

- Video: Advice On How To Use Digital Games As Learning Resources - Jonathon Reinhardt (Video length: 5min 06 sec)

In this video, Jonathon Reinhardt gives some advice on how to use digital games as learning resources.

Watch the video and write a short paragraph explaining if any of this advice would work well with your learners.

- Video: Promising Genres of Digital Games for L2 Learning - Jonathon Reinhardt (Video length: 3min 47 sec)

In this video, Jonathon Reinhardt talks about some promising genres of digital games in L2 learning.

Watch the video and match the games genres with their functions.

Action-adventure games	contextualize language in progression narratives and promote goal-oriented activity
Multiplayer cooperative games	require coordinated collaboration and role-taking
Strategy and simulation games	promote planning, problem-solving and systems thinking
Open world games	promote story-making, creativity and imagination
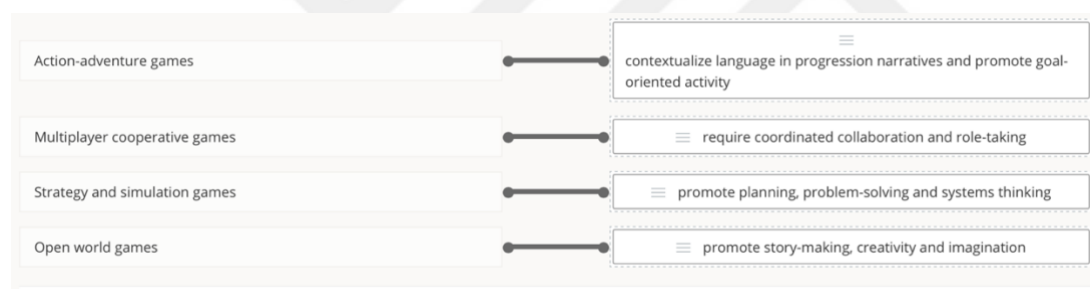
- Video: Examples of Some Digital Games For L2 Learning - Jonathon Reinhardt (Video length: 5min 06 sec)

In this video, Jonathon Reinhardt gives some examples of some digital games that can be used for L2 learning.

Watch the video and choose one game that might work well with your students. Then write a short answer explaining why you think it might fit in your context.

MODULE 3 – TRY_OUT AND DISCUSS

Objectives

At the end of this module, participants will be able to

- practice a real game playing experience,

- reflect on how digital games can be used for L2 learning,

- explain their past experiences of using digital games for language learning,

- argue the pros and cons of using digital games with students in the classroom.

Try-out

Now is the time to explore a commercial digital game for language learning purposes.

Download 'Life is Strange (Episode 1)' on your smartphone and play it for an hour or two. Then write a short reflection explaining how you think this game can be used for L2 learning with your students. You may need your notes for the next unit.

STEPS

1. Go to your App Store (IOS) or Google Play (Android) on your smartphone.

2. Type 'Life is Strange' on search bar (Choose the first episode. It is free).

3. Download the game.

4. Play it for an hour or two.

Discussion Forum

What are the pros and cons of using digital games with students in the classroom? Do you have any experience of this yourself? If so, please share your experience.

Use this area to start discussion threads on the topic below. Follow these steps:

- Click Discussion.

- Click + on the upper right corner to post your topic.

- Enter your comment. You can add attachments as well.

- Click Tick on the upper right corner.

Discussion Forum Principles:

- All posts are expected to be respectful.

- You are free to communicate in your mother tongue.

- You are expected to write at least 2 posts by (specify day of week)

- You are expected to respond substantively to the posts of 2 other learners. Participation in discussion forums is necessary to build knowledge in online learning.

You should post your initial responses by (specify day of week) and follow up with responses to other learners by (specify day of week).

Assessment Rubric for Participation in Online Discussion

Criteria	10	7	4	0
Timeliness and quantity of discussion responses	5 or more postings; well distributed throughout the discussion	3-4 postings distributed throughout the discussion.	1-2 postings; postings not distributed throughout the discussion	No posting
Responsiveness to discussion topics and demonstration of knowledge and understanding from assigned videos and articles.	Assigned videos and articles were understood and incorporated into discussion as it relates to topic.	Assigned videos and articles were understood and incorporated into discussion as it relates to topic.	Little or no use made of assigned videos and articles. Postings have questionable relationships to discussion questions.	No posting

Adapted from 'Sample Discussion Board Rubric' by Purdue Repository for Online Teaching and Learning

https://www.purdue.edu/innovativelearning/supporting-instruction/portal/files/8.2_Sample_Discussion_Board_Rubric_LDT.pdf

CHECK YOUR PROGRESS (Rate Your Learning and Achievement Test)

Rate Your Learning

Question 1

I have a good understanding of the difference between Digital Game-Enhanced Language Learning and Digital Game-Based Language Learning..

a   Completely agree
b   Agree
c   No idea
d   Disagree
e   Completely disagree

Question 2

I know why digital games are used for foreign language learning.

a   Completely agree
b   Agree
c   No idea
d   Disagree
e   Completely disagree

Question 3

I know what the relevant research says about the affordances of using digital games in foreign language learning.

a   Completely agree
b   Agree
c   No idea
d   Disagree
e   Completely disagree

Question 4

I can identify some of the game genres that can be used for language learning.

a   Completely agree
b   Agree
c   No idea
d   Disagree
e   Completely Disagree

Question 5

I am familiar with some digital games for L2 learning.

a   Completely agree
b   Agree
c   No idea
d   Disagree
e   Completely disagree

Achievement Test

Question 1

Digital Game Enhanced Language Learning refers to the use of commercial and non-educational digital games in the field of foreign language teaching.

 True

 False

Question 2

One of the benefits of digital games in language learning is the facilitation of deductive learning, which starts by giving learners rules, then examples, then practice so that learners become co-designers of a game through trial-and-error.

True

False

Question 3

Digital games are used in language learning because they involve authentic, meaningful and interactive language use.

True

False

Question 4

A vernacular game is a game that is made for specific educational purposes.

True

False

Question 5

Digital games can offer affordances to .... (There are 3 correct options)

a   associate form-meaning-function relationships in meaningful contexts.
b   increase language learners' depression and anxiety levels.
c   negotiate goals and actions with others using language.
d   develop learner autonomy.
e   offer language learners a sense of escape from the reality of the world.

Question 6

According to the research, how do people use digital games as informal language learning resources? (Tick 2 correct options)

a   They play familiar games at the right proficiency.
b   They avoid the technical constraints of the games they play.
c   They play any game in their L2 no matter what the game in intended for.
d   They play games that have useful features like subtitles, captioning, repeatability and pausability.

Question 7

Match the game genres with their descriptions.

Column A	Column B
1. Action-adventure games:	a. require coordinated collaboration and role-taking
2. Multi-player cooperative games:	b. promote planning, problem solving and systems thinking
3. Strategy and simulation games:	c. contextualise language in progression narratives and promote goal-oriented activity
4. Open world games:	d. promote story-making, creativity and imagination

<u>EXTRA SOURCES (ARTICLES)</u>

- Digital Game-Mediated Foreign Language Teaching And Learning: Myths, Realities and Opportunities – by Jonathon Reinhardt
- Commercial-Off-The-Shelf Games in the Digital Wild and L2 Learner Vocabulary – by Pia Sundqvist
- Encouraging Free Play: Extramural Digital Game-Based Language Learning as a Complex Adaptive System – by Kyle Scholz
- Digital Games and Language Teaching and Learning - by Julie M. Sykes

UNIT 2 - ASSESSING DIGITAL GAMES FOR SCHOOL CONTENT

MODULE 1 - LEARN:

Objectives

At the end of this module, participants will be able to;

- identify the main factors that should be considered while choosing a learning material,

- talk about the factors to consider when choosing a digital game for L2 learning,

- give examples of some digital games and digital platforms for language learners who are beginners, more advanced players and those who don't like violence.

Warm-up

In this short video, Dr. Steve Jacques talks about some factors that should be considered while choosing a learning material.

Watch the video and answer the question below in a short paragraph.

What advice does Steve Jacques give to the students who want to select a resource for learning? Do you agree or disagree with him?

https://youtu.be/BxC6HiVeOrk (Video Length: 2 minutes 14 seconds)

Discover

- Video: How to Choose Digital Games For Language Learning? - Jonathon Reinhardt (Video length: 4min 18 sec)

In this video, Jonathon Reinhardt recommends some important factors to consider when choosing a digital game for L2 learning.
Watch the video and select 4 factors he talks about in the video.

    a. The difficulty of the game to learn and play

    b. Functionality of the game interface

    c. The adaptability of the game to pedagogical meditation of the lesson

    d. The amount and quality of language in the game

    e. Capability of the system the game is operated

    f. Learner play styles and preferences

- Video: Where Can I Find Digital Games for Language Learning? - Jonathon Reinhardt (Video length: 2min 06 sec)

In this video, Jonathon Reinhardt lists digital games and different digital sources where one can find digital games for school content.

Watch the video and match the games with the categories.

For beginner players	
For beginner players	
For more advanced players	
For more advanced players	
For players who don't like violence	
For players who don't like violence	

:: World of Warcraft   :: Assassin's Creed   :: LifeQuest   :: Minecraft   :: Sims   :: Forge of Empires

MODULE 2 - LEARN:

Objectives

At the end of this module, participants will be able to;

- list 5 key considerations when choosing appropriate educational tools for their classrooms,

- define TPACK,

- explain differentiate domains used in TPACK,

- explain how TPACK is used to choose digital games for school content.

Warm-up

The educational technology space is endless and choosing the right educational apps and tools in your classroom can be a real challenge. You may find that choosing lesson materials or tools is easier after carefully considering what you want students to do with it, and why.

Now read below 5 key considerations when choosing educational technology for your classroom and match them with their explanations.

Discover

- Video: Using TPACK Model to Assess Digital Games For L2 Learning - Diler Oner (Video length: 8min 44 sec)

Diler Oner explains TPACK model and talks about how you can assess technology and particularly digital games for school content by using TPACK model.

Watch the video and decide if the statements are true or false.

1. TPACK is built on the construct of Pedagogical Content Knowledge.
2. Content knowledge refers to the knowledge about the practices and methods of teaching and learning.
3. One particular strategy to integrate technology into teaching is the use of learning activity types or LAT in short.

4. In order to be an effective teacher who integrates technology, the knowledge of content, pedagogy and technology separately is not sufficient.

5. Well-designed game would be like a well-designed lesson from the TPACK perspective where the teacher has successfully identified the learning goals and picked appropriate pedagogical strategies in technologies to support learning.

- Article: An Example of How to Use TPACK Model in Digital Game-Enhanced Language Learning (Reading Time: 1min 25 sec)

Now that you know what the TPACK model is and why it's important, let's look at the example of how you can use your technological, pedagogical content knowledge to assess a digital game.

Read the guidelines below and answer the following question:

- Which of these domains do you think you already practice in your teaching? Which ones do you think you need to focus more?

    1. As mentioned before, the TPACK model is based on three primary forms of knowledge. So your first step should be to understand your primary forms of knowledge in the context of this lesson.

        o Content Knowledge (CK)—what are you teaching and what is your own knowledge of the subject? For this lesson, you'll need a solid understanding of the topic you are teaching.

        o Pedagogical Knowledge (PK)—how do your students learn best and what instructional strategies do you need to meet their needs and the requirements of the lesson plan? In this case, you'll need to understand the needs and interests of your students to make the best decision.

        o Technological Knowledge (TK)—Assuming that you intend to use a digital game in your class, what digital tools are available to you, which do you know well enough to use, and which would be most appropriate for the lesson at hand? For this lesson, each student will need a smartphone. Do they have everything they need?

    2. Now that you've taken stock of your primary forms of knowledge, focus on where they intersect. While the ultimate goal is to be viewing your lesson and strategy through the lens of TPACK, or the center of the model where all primary forms of knowledge blend together, taking a moment to consider the individual relationships can be helpful.

        o Pedagogical Content Knowledge (PCK)—understanding the best practices for teaching specific content to your specific students.

        o Technological Content Knowledge (TCK)—knowing how the digital tools available to you can enhance or transform the content, how it's delivered to students, and how your students can interact with it.

        o Technological Pedagogical Knowledge (TPK)—understanding how to use your digital tools as a vehicle to the learning outcomes and experiences you want.

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MODULE 3 – TRY-OUT AND DISCUSS:

Objectives

At the end of this module, participants will be able to;

- explain how they can use different domains of TPACK model when choosing a digital game for school content,

- assess a digital game for school content using TPACK model.

Try-out

You played 'Life is Strange' last week and you are already familiar with the game. Now use the TPACK checklist below (download the fillable pdf to your phone here) to determine whether the digital game 'Life is Strange' can be integrated to your classroom learning.

After assessing the game, write a short paragraph answering the question below;

How appropriate do you think 'Life is Strange" digital game is for your own classroom in terms of different types of knowledge?

TPACK CHECKLIST

If you choose 'Life is Strange' game as a learning activity, do you think ....

a) Technological Knowledge (TK)

1. you will have essential technology tools to use the digital game as a learning activity?

2. you will be able to use the digital game to support instructional strategies?

3. you will be able to use the digital game as a learning activity without any problems?

b) Content Knowledge (CK)
1. you exhibit a good mastery of subject matter knowledge that students are expected to learn while playing the game?

2. you will be able to reinforce the target learning point of the lesson by providing assignments to students after or before playing the game?

c) Pedagogical Knowledge (PK)

1. you know essential pedagogical approaches for the lesson preparation and presentation (collaborative learning, critical thinking, problem-based learning, etc.)?

2. you demonstrate an understanding of different styles of student learning?

3. you will be able to structure a student-centered learning environment?

d) Technological Content Knowledge (TCK)

1. you will be able to use this digital game to demonstrate complex ideas that would otherwise be difficult to learn?

2. you will be able to use this digital game to observe things that would otherwise be difficult to be observed by the naked eye?

3. you will be able to assist students to use the digital game to investigate and construct meaning of the complex ideas they are learning?

4. the digital game is attractive (layout) and support the theme/content of the lesson?

e) Technological Pedagogical Knowledge (TPK)

1. you will be able to introduce technology-based tasks that enable students to engage in learning?

2. you will be able to use technology to interact and collaborate with students in different teaching and learning activities?

f) Technological Pedagogical Content Knowledge (TPACK)

1.you will be able to teach a lesson that appropriately combines subject content, digital game and teaching and learning approaches?

2. you will be able to use technology to support student learning approaches for the lesson taught?

3. you will be able to use the digital game to support learners' collaboration during the learning process?

4. you will be able to be well-prepared (having a lesson plan) and able to use the digital game to present a relevant lesson content?

DISCUSSION FORUM

Before choosing a digital game for school content, it is important to understand the different genres available and how to identify them. The following list classifies different game genres.

- Choose the genres you think you can benefit from in your teaching. Then discuss these questions in the discussion forum.

- Why did you choose these genres?

- Considering different domains in TPACK framework, how do you think you can use the digital game in your preferred genre with your students?

a   SHOOTERS: In these games, players have to win by shooting their opponents.

b   BAT AND BALL GAMES: In these games, players use a bat to hit the ball.

c   PLATFORMERS: In these games, players move through an environment where they need to progress to platforms.

d   PUZZLES: In these games, players have to solve a puzzle to progress further in a game.

e   MAZES: In these games, players have to navigate through a maze and are chased by enemies that they have to avoid.

f   SPORT GAMES: These games simulate popular sports such as football, golf or basketball.

g   RACING GAMES: In these games, players take part in a race, driving a car, a motorbike or a spaceship.

h   RTS (REAL TIME STRATEGY): In these games, players control both the economic and military aspects of an army or population and have to take fast strategic decisions.

i   RPG (ROLE PLAYING GAMES): In these games, players impersonate a fictional character that can evolve through play, such as health, strength or other skills.

j   FPS (FIRST PERSON SHOOTERS): In these games, players see the world through the eyes of the character they impersonate and need to eliminate enemies in order to progress further.

k   MMORPG (MASSIVE MULTIPLE ONLINE ROLE-PLAYING GAMES: They are similar to RPGs, in which a larger number of players interact in an online virtual world.

l   ADVENTURE GAMES: In these games, the gameplay is based on storytelling, in which players navigate through a complex world, collecting objects and overcoming challenges until they reach the final goal.

CHECK YOUR PROGRESS (Rate Your Learning and Achievement Test)

Rate Your Learning

Question 1

I know how to choose digital games for language learning.

a   Completely agree
b   Agree
c   No idea
d   Disagree
e   Completely disagree

Question 2

I have a good understanding of the difference between content, pedagogy and technology knowledge areas in TPACK framework.

a   Completely agree
b   Agree
c   No idea

d   Disagree

e   Completely disagree

Question 3

I know how I can use TPACK framework when assessing digital games to support school learning.

a   Completely agree

b   Agree

c   No idea

d   Disagree

e   Completely disagree

Question 4

I know where I can find digital games for language learning.

a   Completely agree

b   Agree

c   No idea

d   Disagree

e   Completely disagree

Achievement Test

Question 1

Which of these <u>is not important</u> to consider when choosing a game for language learning?

a   The amount and quality of target language used in the game

b   The play styles and preferences of the learners

c   The release date of the game and its up-to-dateness

d   The target language proficiency of the learners

Question 2

Among several types of knowledge that would constitute the knowledge base for teaching, TPACK is built on the construct of ....

a   content knowledge

b   general pedagogical knowledge

c   curriculum knowledge

d   pedagogical content knowledge

Question 3

Which best describes the Content Knowledge domain in the TPACK framework?

a   What teachers know

b   How teachers teach

c   How technology is used

d   Where teachers use technology

Question 4

Which best describes the Pedagogical Knowledge domain in the TPACK framework?

a   What teachers know

b   How teachers teach

c   How technology is used

d   Where teachers use technology

Question 5

Which best describes the Technological Knowledge domain in the TPACK framework?

a   What teachers know

b   How teachers teach

c   How technology is used

d   Where teachers use technology

Question 6

TPACK is the knowledge of how to teach specific content with appropriate technological tools and pedagogical methods.

True

False

Question 7

TPACK is a conceptual framework for language teachers to integrate technology into language learning. This framework is not applicable for other subject areas.

True

False

Question 8

No single combination of content, technology, and pedagogy will apply for every teacher, every course, or every view of teaching.

True

False

Question 9

One particular strategy to integrate technology into teaching is the use of learning activity types or LAT in short.

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True

 False

Question 10

Well-designed game would be like a well-designed lesson from the TPACK perspective where the teacher has successfully identified the learning goals, picked appropriate pedagogical strategies in technologies to support learning.

 True

 False

EXTRA SOURCES (ARTICLES)

- Digital Game Analysis: Using the Technological Pedagogical Content Knowledge framework to determine the affordances of a game for learning – by Aroutis N Foster, Punya Mishra and Matthew J Koehler
- Using the Technological Pedagogical Content Knowledge (TPACK) – Inquiry, Communication, Construction, and Expression Framework to Evaluate Educational Digital Games – by Matthew Duvall, Aroutis Foster

UNIT 3 – INTEGRATING DIGITAL GAMES INTO CLASSROOM LEARNING

MODULE 1 - LEARN

Objectives:

By the end of this module, participants will be able to;

- give examples of the learning activities for different phases (pre-while-post) of game play,

- identify the essential factors that makes Digital Game-Enhanced Language Learning more effective.

Warm-up

In order to hasten the process of finding a game that meets learner needs, it is important to keep some factors in mind, such as intervention, enrichment and reinforcement.

Match these factors with their explanations below.

Intervention		
Enrichment		
Reinforcement		

⠿
Instead of using games to teach and engage individual students, entire classes can play to reinforce curriculum content. This can also make game-based learning a group activity. Some games have multiplayer features and students may naturally compete against each other to earn higher scores.

⠿
If a student is struggling to demonstrate understanding of core material, you may consider using a game to address his or her trouble spots. The game you choose should therefore deliver content that adjusts itself to player knowledge and learning style. This should help the student gain a better understanding of difficult material.

⠿
As students master core material, you may want a game that presents content through different media. For example, it may give questions through text, audio, images and more. This should encourage students to challenge themselves as they explore new ways to process the content.

Discover

- Video: How to Design a Class for Game-Enhanced Language Learning – Jonathon Reinhardt (Video length: 6min 03sec)

In this video, Jonathon Reinhardt gives some ideas to design a lesson for Digital Game-Enhanced Language Learning.

Watch the video and match the learning tasks with the correct phases of play.

Pre-play task		
During-play task		
Post-play task		
Follow-up task		

⠿ Narrativization   ⠿ Vocabulary jeopardy   ⠿ Plannning for gameful learning   ⠿ Comprehension and recounting

- Video: A Few Tips to Integrate Digital Games for Language Learning - Jonathon Reinhardt (Video length: 2min 40sec)

In this video, Jonathon Reinhardt gives a few tips to integrate digital games for language learning. Watch the video and write a short paragraph explaining which of these tips might work well with your students and which of these might not.

MODULE 2 - LEARN

Objectives

By the end of this lesson, participants will be able to;

- explain different phases of the PCaRD model,

- identify the characteristics of ICCE framework,

- analyze play, curricular activity, reflection and discussion phases of PCaRD model.

Warm-up

In this unit, we are going to learn how to use PCaRD and ICCE Framework to integrate digital games into classroom learning. But first of all, let's remember why we need frameworks.

1. By the help of of teaching and learning frameworks, instructors can organize classroom activities according to the learning goals.
2. Students' prior knowledge is not an important factor to consider for an effective teaching and learning framework.
3. Teaching and learning frameworks help students decide when and how to apply the skills and knowledge they learn.

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Read the article below and decide if the statements are true or false.

WHY DO WE NEED TEACHING AND LEARNING FRAMEWORKS?

Teaching and learning frameworks are research-informed models for course design that help instructors align learning goals with classroom activities, create motivating and inclusive environments, and integrate assessment into learning. They serve as conceptual maps for planning or revising any course, syllabus, or lesson, and can be easily adapted and mixed.

Effective frameworks emerge from psychological, cognitive, sociological, and educational research findings that students learn best when

a) the prior knowledge and "preconceptions" they bring into the classroom are recognized and engaged,

b) they have practice and time to build "conceptual frameworks" upon foundational knowledge through active, experiential, and contextually varied learning, and

c) they have practice and time to "take control of their own learning" through metacognitive reflection.

Frameworks provide scaffolded, diverse approaches that help students "form knowledge structures that are accurately and meaningfully organized" while informing "when and how to apply the skills and knowledge they learn".

Discover

- Article: An Introduction to PCaRD Model and ICCE Framework (Reading Time: 2min 50 sec)

Read the article and answer the questions below.

Write the names of phases that the PCaRD model is comprised of.

What are the four characteristics of ICCE framework? Why do we use ICCE framework when integrating digital games into L2 learning?

- Video: Using PCaRD Model To Integrate Digital Games in L2 Classroom Learning - Aroutis Foster (Video length: 8min 17sec)

Play Curricular activity Reftection Discussion (PCaRD) is a systematic approach developed to aid teachers in corporating games and it was designed by Aroutis Foster. In this video, he talks about his own model.

Watch the video and decide if the statements are true or false.

1. When integrating games into learning, the first thing that a teacher needs to do is to analyze the game.
2. Teachers need to analyze the game for only content and pedagogy.
3. In his work, Aroutis Foster had his students engage in about 1 hour of gameplay.
4. After playing a digital game, students engage in a curricular activity that's tied to the gameplay,
5. After gameplay, the teacher must provide opportunities for students to reflect on what they've just experienced.

MODULE 3 – TRY_OUT AND DISCUSS

Objectives

By the end of this lesson, participants will be able to;

- develop a lesson plan on Digital Game Enhanced Language Learning lesson using PCaRD model,

- discuss the strengths and weakness of a lesson plan on Digital Game-Enhanced Language Learning.

Try-out

You are going to design a digital game-enhanced language learning lesson using the digital game, 'Life is Strange', whose content and pedagogical approaches you are already familiar with.

The aim of the lesson will be to provide students with an alternative learning experience through the use of interactive learning environments.

You are going to use PCaRD model while developing the lesson. Here you can find a lesson plan that has been developed for your use. Add your own ideas, develop an activity and then share your lesson plan in this topic.

Discussion Forum

Now that you have developed a lesson plan on Digital Game-Enhanced Language Learning, discuss these questions with your colleagues.

- What kind of an activity did you develop in the lesson plan? Why?

- What do you think will work in this lesson with your students and what will not?

- What do you think your students might think about this gameful activity?

CHECK YOUR PROGRESS (Rate Your Learning and Achievement Test)

Rate Your Learning

Question 1

I can identify play, curricular activity, reflection and discussion phases of the PCaRD model.

- Completely agree
- Agree
- No idea
- Disagree
- Completely disagree

Question 2

I know how to use PCaRD model to integrate digital games in language learning.

- Completely agree
- Agree
- No idea
- Disagree
- Completely disagree

Question 3

I can list a few tips to integrate digital games for language learning.

- Completely agree
- Agree
- No idea
- Disagree
- Completely disagree

Achievement Test

Question 1

A pedagogical model is necessary to implement digital games effectively in language teaching, guiding teacher intervention and helping student learning and assessment.

 True

 False

Question 2

PCaRD model is comprised of four phases, which are   ,   ,   , and   .

Blank 1:

Blank 2:

Blank 3:

Blank 4:

Question 3

In order to integrate digital game into school content, the first thing that the teacher should do is to analyze the game for both pedagogy and content.

 True

 False

Question 4

How does inquiry, communication, construction and expression (ICCE) framework help teachers integrate digital games in students' language learning?

 a   The ICCE framework contributes to the naturalistic play environment without any interruption.
 b   The ICCE framework connects students' gameplay experience to their application of content knowledge.
 c   The ICCE framework bridges game analysis and game integration by helping teachers in the identification of learning experiences and design of opportunities that may be lacking in a game.
 d   The ICCE framework helps teachers assess students through their interactions with peers, and conversations with students while playing the game.

Question 5

In what order do teachers use these activities while implementing PCaRD model in a digital game based learning classroom?

   1. engaging students in reflection tasks on the curricular activities

   2. engaging students in naturalistic game-play

   3. engaging students in curricular activities that are connected to game-play

   4. engaging students in discussion tasks led by students and teachers to reconcile classroom-learning goals from the activities

Question 6

PCaRD model facilitates student learning with teacher-designed opportunities for inquiry, construction, communication and expression (ICCE).

 True

 False

Question 7

Teachers can choose any game genre for language learning on the condition that students enjoy the game.

 True

 False

Question 8

Even if a majority of your students have no interest in learning through digital games, there is always a possibility that students want to participate if teacher has a well-planned lesson.

 True

 False

EXTRA SOURCES (ARTICLES)

- The Play Curricular Activity Reflection Discussion Model for game-Based Learning, by Aroutis Foster

UNIT 4 – EXPERIENCES OF A LANGUAGE INSTRUCTOR USING DGELL

Objectives:

By the end of this unit, participants will be able to;

- identify some important questions that might arise when language instructors want to implement Digital Game-Enhanced Language Learning,

- discuss some solutions to these questions with an experienced language instructor who implemented DGELL in a similar context before,

- discuss how to implement this method in language instructors' own context with the other language instructors.

Discover

- Video: Experiences of a Language Instructor on DGELL – Seda Musaoglu (Video Length: 21min 12 sec)

Seda Musaoğlu Aydın, an EFL instructor in a Turkish university, implemented Digital Game-Enhanced Language Learning method in her class in one semester. In her video, she answers 10 most common questions asked by the language instructors who are interested in using this method in their classes.

Watch the video and make note of your questions. You will be able to discuss your question with Seda in the discussion forum.

In order to help learners identify the content that is most relevant to their needs, in addition to the full video, the content has also been given divided into 10 parts according to the questions.

Q1: ARE YOU A TECH EXPERT? WHAT IS YOUR GAME PLAYING EXPERIENCE? (1 min 17 seconds)

Q2: WHAT KIND OF CONCERNS DID YOU HAVE BEFORE IMPLEMENTING DIGITAL GAME-ENHANCED LANGUAGE LEARNING? (1min 19 seconds)

Q3: DID YOU EVER WORRY THAT STUDENTS MIGHT ADDICTED TO GAME PLAYING? (55 seconds)

Q4: WHAT STEPS DID YOU FOLLOW WHILE CHOOSING THE RIGHT GAME FOR YOUR STUDENTS? (1 minute 56 seconds)

Q5: HOW DID YOU INTEGRATE THE DIGITAL GAME INTO YOUR CLASSROOM LEARNING? (6 minutes 33 seconds)

Q6: HOW MUCH TIME DID YOU DEVOTE TO THE PREPARATIONS? WAS IT WORTH IT? (47 seconds)

Q7: WHAT ARE THE LIMITATIONS AND PROBLEMS YOU CONFRONTED IN THE WHOLE PROCESS? (2 minutes 16 seconds)

Q8: DO YOU THINK DGELL IS APPLICABLE IN YOUR SCHOOL'S CURRICULUM? (2 minutes 08 seconds)

Q9: WHAT WOULD YOU DO DIFFERENTLY TO IMPROVE THE EFFECTIVENESS OF USING THIS METHOD IN YOUR CLASSROOM? (52 seconds)

Q10: WHAT ADVICE WOULD YOU GIVE TO HELP OTHER LANGUAGE INSTRUCTORS IMPROVE THEIR LEARNING IN THIS mTPD COURSE ON DGELL? (2 minutes 30 seconds)

Discussion Forum

In this discussion, you will be able to compare your notes with Seda and the other participants. Read the questions below and share your questions and other ideas. Seda is following all the posts and she will respond correspondingly.

What questions have arisen while listening to Seda regarding her experiences in Digital Game-Enhanced Language Learning?

In what aspects do you agree with Seda and in what aspects you don't?

I. CODEBOOK FOR THE QUALITATIVE ANALYSIS

<table>
<tr><th colspan="3" align="center">BENEFITS</th></tr>
<tr><th>CODE</th><th>DESCRIPTION</th><th>EXAMPLE</th></tr>
<tr>
<td>Prompted a new way to reach students</td>
<td>Responses mentioning that teachers discovered new ways to create meaningful learning experiences for students by using digital games after completing the mTPD course.</td>
<td>"Ben kendim oyun oynamayı hiç sevmem ve hiç oynamam ve yapamam da zaten öyle bir sabır da gösteremiyorum ama öğrenciler için farklı onların ilgi alanı olabiliyor zamanları da var O zaman neden olmasın bence çok güzel bir fikir bu."</td>
</tr>
<tr>
<td>Enabled the application of theory into practice</td>
<td>Responses mentioning that teachers can adapt practice to theory by identifying teaching situations in which theoretical information in the mTPD course is relevant.</td>
<td>"Ne kattı bana ders planı yani tpack İle bir ders planı yapabilirim diye düşünüyorum hani oradaki kriterlere dikkat ederek işte o modele uygun olarak bir ders planı hazırlayabilecegimi düşünüyorum"</td>
</tr>
<tr>
<td>Enabled autonomous learning</td>
<td>Responses mentioning how the mTPD course provided autonomous learning for the teachers.</td>
<td>"Ben çok keyif alıyorum açıkçası kendi Eğitime kendim devam etmek istediğim zaman başlamak istediğim zaman kendi kararlarını verebiliyor olmak aslında hiç sevmeyeceğimi düşünmüştüm ama çok sevmiştim"</td>
</tr>
<tr>
<td>Provided an effective guideline</td>
<td>Responses mentioning how the mTPD course provided guidelines to help language teachers prepare their lessons using digital games effectively.</td>
<td>"Bu eğitimi almasaydım 10 yıllık hocalık kimliğimle 5 adımlı ya da 4 adımlı bir ders planı oluşturamazdım herhalde ya da PCaRD modelini harfi harfine takip edemezdim… Bu dersin yanına bile yaklaşamayacak bir ders tasarlamış olurdum ama böyle pedagojik ve sound yaklaşımım ve informed kararlarım olmadan bir şey yapmış olurdum yani sadece oyun kullanmış olurdum."</td>
</tr>
<tr>
<td>Enabled realization of using digital games as authentic learning sources</td>
<td>Responses mentioning that the mTPD course provided teachers real-world scenarios and situations while learning.</td>
<td>"Ben bu tür oyunların derste kullanılacağını hiç düşünmemiştim açıkçası çok hatta saçma bir fikir gibi geliyordu vakit çok alacağı için ve bireysel bir durum olduğu için oyunlar ama fikrim biraz değişti"</td>
</tr>
<tr>
<td>Provided real life example</td>
<td>Responses mentioning that teachers could make use of the content of the last unit in the mTPD course, which was based on the experiences of a language</td>
<td>"Derste içerik açısından en çok hoşuma giden şey tecrübe etmiş hocamızla yapılan görüşme idi çünkü orada canlı bir örnek vardı bu oyunu kullanan.'</td>
</tr>
</table>

	instructor who implemented DGELL in a real classroom.	
Provided application of knowledge in each module	Responses mentioning that teachers performed a task that is related to the newly learnt content after learning the new information.	"Her bölümün bir aktiviteyle verilmesi iyi oldu, yani izledin şimdi şunu yap gibi çünkü tam izlerken atladığım bir şey meydana çıktı mesela"
Provided information and know-how from the experts in their fields	Responses mentioning that teacher made use of the video content prepared and delivered by different experts in the modules.	"Birinci elden konuşmaların ve oradan anlatılan şeylerin güvenilir bilgiler olduğunu düşündüm. Yani oradaki o videoların uzmanlar tarafından verilmesi ve ilk elden ona ulaşmam hoşuma gitti ve bu bilgilere güvenilebilir diye düşündüm"
Learning anytime and anywhere is possible due to mobility	Responses mentioning the possibility of studying and learning at the moment teachers want it using the technology they prefer.	"Mümkün olduğunca her şeyi mobil yaptım ben bilgisayardan bakmadım bilerek, bakalım nasıl gidiyor diye. Şöyle bir avantajı olduğunu düşündüm ben yemek pişirirken bile kulağıma takıp bir videoyu dinleyebiliyordum, burada görseli olanları görebiliyordum, bu bana çok büyük bir avantaj çünkü bazı zamanlar bana vakit kaybı."
Enriched pedagogical knowledge	Responses indicating that the knowledge of teachers for creating effective teaching and learning environments for students improved after the mTPD course.	"Hani endişeyle başladım yabancıyım oyun oynamıyorum oynamadığım bir şeyle bunu kendi programıma dahil edip öğrencilerime kullanacağım o yüzden ben çok önyargılı başlamıştım ama sonra her daim kullanabileceğim oyun dışında da kullanabileceğim bir takım bilgiler elde ederek devam ettim yoluma"
Made connections to other teachers	Responses indicating that teachers were able to communicate with other teachers and shared information and opinion with each other.	"Ama tartışma yaptık ya hani oradaki etkilesimi sevdim hosuma gitti baskalarinin fikirlerini de gorup onlarla bir sohbet ortami kurmak birbirimize dönüt verdik çok güzel yani ben çok faydalı faydalandım bir safe zone yaratti bana orada konusulan seyler yalniz olmadigimi hissettirdi bana"

CHALLENGES		
CODE	DESCRIPTION	EXAMPLE
Too much time spent on lesson planning	Responses mentioning that teachers spent more time than anticipated for the lesson planning task and they needed extra time.	"Ders planında çok zaman geçirdim oradan teorisi tekrar izlemem gereken bir şeydi."

Screen size could be limiting	Responses discussing that the diagonal length from one corner to the corner furthest away of the viewable screen area of the mobile devices used in the mTPD course was small and it made it difficult for some learners to use the mTPD course.	"Dezavantajı tabi ekranın büyüklüğü insanı sınırlayan bir şey çünkü yazılar sağa sola aşağı yukarı doğru gidiyor geliyor doğal olarak yani bu durum öğreneni ara sıra sinirlendirebilir."
Concentration is difficult due to mobility	Responses indicating the difficulty to pay attention to the course content on mobile devices or when the learner is mobile.	"Şeyden çok emin değilim, insanlar yolda giderken otobüsle giderken metroda giderken acaba açar bunu yapar mı, yapamaz diye düşünüyorum. Mesela kelime bilgisi biraz daha kolay bir konu ama oyun ve bununla ilgili şey ben öğrenir miydim genç bile olsam konsantrasyon gerektirdiği için tercih etmezdim mobil öğrenmeyi çünkü oturup sakin bir şekilde dingin bir ortamda yapmayı tercih ederdim."
Difficulty to correct typos on mobile devices	Responses indicating a difficulty to correct mistakes while typing on mobile devices.	"Ders planını yazarken bir sürü yazım hatası göreceksiniz, bunların hepsini cep telefonu üzerinden yaptım. Tamamıyla her şeyi telefondan yazmaya çalıştım orada yazım hatası çıkıyor. Bir düzelttim iki düzelttim, diğerlerinde artık akışına bıraktım kendimi."
Sharing homework on mobile devices was not easy.	Responses indicating a difficulty to submit homework on mobile devices.	"Uygulama dışında başka bir uygulama üzerinden çalıştığı için bu mobil cihazlarda teknik olarak bir sınırlama olabilir yani ders planı Google docs üzerinden paylaşıyordu. yani her cihaz Google docs açmayabilir. Ders planını detaylı incelemek için mobil cihazın dışına çıkmak zorunda kaldım"
Difficulty to download game because of device requirements	Responses indicating a difficulty to download and play the 'Life is Strange' game because of technical barriers.	"O oyunu oynamak benim için bir sorundu o oyunu oynamak benim için sıkıntıydı o yüzden oyunu izledim"

SUGGESTION		
CODE	**DESCRIPTION**	**EXAMPLE**
Need for feedback about course progress	Responses indicating a necessity for feedback when teacher wants to understand what they did well and what	"Yani ben nasıl gidiyorum acaba ne düşünüyorlar acaba gidişim iyi mi yani bunu bilmek istiyorsunuz. Doğru yolda düşünüyor muyum yani bir de diğer arkadaşlar nasıl gidiyor acaba, ben

	they could do better in the mTPD course.	böyleyim ama onlar nasıldı acaba? Yani benden daha iyi yapan birinden bir tüyo almak isteği oluyor Burada tam olarak yaşayamadığımız için bir dezavantaj olarak görünüyor, belki öbür uygulamada daha canlı olarak oluşursa dezavantajı kaybolur diye düşünüyorum"
Target group of the mTPD course	Responses indicating what grade level of teachers this mTPD course is appropriate for and referring to the teacher qualities essential for the effectiveness of the mTPD course.	"Bu çalışma en deneyimsiz hocadan en deneyimli hocaya kadar alanda çok tecrübeli görmüş geçirmiş hocalara kadar herkesin bu sürece yani oyunları kullanma noktasına kadar en azından kötü de olsa bir tasarım ortaya çıkarıp bir uygulamanın sonucunda dönüt alıp geri dönüp uygulamalarını geliştirecekleri kadar yönlendirici bir program"
I wish I had a badge	Responses that involve suggestions to use badges in the mTPD course to award people who complete the objectives of the course.	"Badge'ler var ya genel olarak kullanılıyor belli şey şeyleri olsa bilmiyorum senin çalışma kapsamının içine girer mi ama mesela böyle ben hoca olarak bunu yapabileceğim için bir rozetim olsa"
You can give more time	Responses indicating that teachers needed more time to complete the mTPD course.	"Daha çok zaman verebilirsiniz özellikle uygulamada ders planlamasında çünkü örnek bir ders planlarken geri dönüp okuyup ya da videosuna bakıp tekrar yapması gerekebilir kişinin."
Need for support in creating a new lesson plan	Responses indicating a necessity to see sample lesson plans before preparing a real lesson plan and more information about how to prepare their lesson plans.	"Bir kere örnek bir ders planı olması lazım sanıyorum yani birisinin bunu yapabilmesi için sadece kelime bilgisi için değil herhangi bir gramer noktasını öğretmek için nasıl bir ders planı yapılabilir çünkü bir başka bir frameworke geçince insan şaşırıyor."
Need for more explicit guide for implementations	Responses indicating a necessity to see concrete teaching techniques to relate their knowledge and skills teachers learned in the mTPD course.	"Tamam ben teoriye okudum anladım ikna da oldum, sınıfta uygulamak için de çok güzel tamam ama ne yapacağım tam olarak"
A different type of game may be added	Responses suggesting that teacher expected to see more games in different genres in the mTPD course.	"Tek bir çeşit gösteriyor otantik oyun üzerinden gidiyor. Belki bir modül eklemeyi düşünürsen başka bir tarz oyun da düşünülebilir"

The need for providing cooperation	Responses indicating expressions underlying the need to cooperate and share opinions of teachers during the process. This could also include expressions to improve discussion part of the course to facilitate communication among the participants.	"Ufak bir yardımlaşma iyi olabilir herkese, insan yanındakinin nasıl yaptığını, hislerini paylaşabileceğimiz ya da birisinin yardım ediyor olması iyi olur. Gerçi orada tartışma bölümü var hocaların bunu etkin olarak kullanmasına yöneltmek belki iyi olabilir. Yani el ele tutuşmak istiyorum birileriyle"
Course navigation could be improved	Responses indicating the usability of different links and menus in the mTPD course and the extent to which the learners can move between these menus.	"Bazen nerede kaldığımı çok göremedim yani burada çok fazla göstermiyor ama sonunda buldum. O da büyük bir sıkıntı mı bilemedim. Bazı şeyleri nereden tıklayıp görebileceği mi bilemedim mesela başarı testinin acaba cevaplarını nasıl görebileceğimi tam anlamadım."
The need for improving teacher-learner communication	Responses indicating a necessity for the links showing learners how to communicate with the trainers when they need help with the course.	Tasarımcıya ya da hocaya ne zaman ve nasıl ulaşılabileceği bilgisi verilebilir. Hani ben takıldıysam ders planıma bir şey diyecek mi acaba diye sormak istesem sorar mıydım diye düşündüm çünkü bir iki yerde ya da bu başarı testleri ile ilgili dönüt almadığımı zannettiğim yerde acaba hocaya sorayım mı diye aklımdan geçti."
Sentences in some questions could be shortened.	Responses indicating a difficulty to drag and drop or read long sentences in the achievement tests.	"Bazı maddeler maalesef çok uzundu, yani mobil cihaz uyumluluğundan dolayı birkaç satır madde olduğunu hatırlıyorum hani bu işte testingde çok tercih edilen bir şey değil"
Need for more input while teaching new content	Responses indicating a necessity to include more learning sources to support teachers' learning.	"Ben biraz daha okuyarak öğrenen birisi olduğum için hani okuma kısımları belki biraz daha fazla olabilirdi ya da video olsa bile okuma parçasıyla bir şeyle desteklemek isterdim daha kalıcı olurdu benim için"
Need for information about course load	Responses suggesting that teachers needed to know the amount of work and time they were supposed to devote before starting the course.	"Bizden beklenilen ne, sadece derslere katılmak ve dinlemek mi, yani bu kadar çok task verileceğini açıkçası tahmin etmemiştim. O yüzden birazcık benim açımdan bayağı vaktimi alan bir çalışma oldu. Yani güzel olsa da zamanlaması bana uymadı yani neleri içeriyor program böyle kabataslak anahatlarıyla eğer güzel bir çizelge içinde yollayabilseydiniz daha fazla bir fikrimiz olurdu"
Need for transcript of videos	Responses indicating that some teachers needed to see the transcripts of the videos.	"Önceden aldığım eğitimlerde altta bir de transkripti veriyordu yani bizim için önemli değil tabi ama bir başkası ama İngilizcesi çok iyi olmayan ve bu eğitimi alan biri öyle bir faydası olabilir onun

		dışında arayüzü basitti bir problem yaşamadım telefonumda"

SATISFACTION		
CODE	**DESCRIPTION**	**EXAMPLE**
Satisfaction with the course design	Responses indicating teacher satisfaction or dissatisfaction related to the program of the mTPD course.	"Muhtemelen bundan daha başarılı bir tasarım yapamazdım Hani onu söyleyeyim, gönül rahatlığıyla teşekkür ederim. Emeği geçen herkese tüm samimiyetimle söylüyorum.
This mTPD course fulfilled my expectations	Responses indicating teacher satisfaction or dissatisfaction indicating whether the mTPD course fulfilled their expectations from the program.	"Bu eğitim de bence bu ihtiyacı karşılayabilir en temel konuda bu algıyı yıkmak açısından yeterli oyun var ama ben hiç oyun oynamıyorum nasıl dahil edeceğim dahil edilir yani cevabı çok basit yani o cevabı almak için bile yeterli olur bu eğitim"
Satisfaction with achievement tests	Responses indicating teacher satisfaction or dissatisfaction related to the items in the achievement tests.	"ünite sonlarındaki değerlendirme testlerinde sorulan sorular yeterliydi gayet iyiydi"
Satisfaction with warm-up tasks	Responses indicating teacher satisfaction or dissatisfaction related to the relevancy of the warm-up tasks to the module activities.	"Warm up aktiviteleri çok iyiydi, aktiviteler modül konularıyla direkt ilişkiliydi. Tanımları ya da kriterleri vererek onu etkinlikle yaptırarak bir ısınma yapıyoruz onları çok beğenmiştim ben yani kısa ve öz beni çok yormuyor ama konuya da girişimiz sağlıyor."
Satisfaction with the depth of content	Responses indicating teacher satisfaction or dissatisfaction related to the quality of the videos and texts.	"Çok yoğun bir bilgi bombardımanı yoktu, sadece ihtiyacım olan bilgiye ulaşacak ve bir sonraki aşamaya geçmeme yetecek kadar olan bilgiye özenle seçilip ve içerikler onun çerçevesinde oluşturulmuştu. Bu da zamandan tasarruf sağlıyordu ve bir şekilde kişilerin motivasyonunun kaybolmasının önüne geçmekteydi"
Satisfaction with the videos	Responses indicating teacher satisfaction or dissatisfaction related to the quality of the videos in the mTPD course.	"Derste en çok hoşuma giden şey küçük küçük bölünmüş videoların olması ve mantıklı bir şekilde bölmüşler ve küçük bir bölüm izliyorsunuz ve oradan alabileceğiniz kadar bilgiyi oradan anlayıp oturtabileceğiniz bilgiyi örnek vererek anlatıyor."
Satisfaction with multiple content types and formats	Responses indicating that the mTPD course includes different kinds of learning methods and	"Farklı medya bulundurmanız da iyiydi. Yani sadece video yoktu, farklı input da

	sources such as videos, articles, classroom activities, lesson plans etc.	vardı inputun farklılaşmış olması özellikle çok hoşuma gitti."
Satisfaction with extra materials	Responses indicating teacher satisfaction or dissatisfaction related to the extra materials (articles, classroom activities, etc) at the end of each unit.	"Extra materyaller vardı derste, ben onlardan faydalandım, yani ben onlardan çok şey öğrendim. Hemen yansıtabildim mi ders planına o ayrı bir konu ama çok şeye uyanmama sebep oldu."
Satisfaction with clear and effective instructions	Responses indicating teacher satisfaction or dissatisfaction related to detailed information about how the tasks and modules should be done or completed.	Instruction'lar çok açık ve netti yani. Yönergeler herhangi bir aktivitenin amacı herhangi bir aktivitenin sonucunun nereye bağlanacağı nasıl değerlendirme olacağı yani çok açık."
Satisfaction with check your progress activity	Responses indicating teacher satisfaction or dissatisfaction related to the check your progress part in which they can see what and how much they learned in the mTPD course.	"Check your progress gayet iyiydi insanlar bunu yapmayı sever yani yapması iyi olan ben neredeyim acaba diye yapması iyi olan bir şey"
Satisfaction with the rubrics	Responses indicating teacher satisfaction or dissatisfaction related to the set of instructions given in each module to evaluate learner performance.	"Rubriklerin olması çok güzeldi"
Satisfaction with the program objectives	Responses indicating teacher satisfaction or dissatisfaction related to the program objectives given at the beginning of each module.	"Objektiflere hep eklemişsiniz o kısımları baya seviyorum yani neler öğreneceğimi her ünite başında neler öğreneceğimi dönüp bak ben bunları öğrendim diye kontrol ettim yani yaparken objektif kısımlarını eklemiş olmanız da güzeldi"

J. CONSENT FORM

ARAŞTIRMAYA GÖNÜLLÜ KATILIM FORMU

Bu çalışma ODTÜ Eğitim Bilimleri Bölümünden Dr. Öğr. Üyesi Nur Akkuş Çakır'ın danışmanlığında Emrah Baki Başoğlu tarafından yürütülmektedir. Bu form sizi araştırma koşulları hakkında bilgilendirmek için hazırlanmıştır.

Çalışmanın Amacı Nedir?

Türk eğitim sisteminde yabancı dil öğretiminde yenilikçi öğretim yöntemleri geliştirmek amacıyla çeşitli araştırmalar yapılmaktadır. Biz de dijital oyunların yabancı dil öğretiminde nasıl kullanılacağına yönelik bir öğretmen mesleki gelişim programı tasarladık ve öğretmenlerle yapacağımız uygulamalar ve onlardan gelecek dönütlerle bu programı geliştirmeyi amaçlıyoruz.

Bize Nasıl Yardımcı Olmanızı İsteyeceğiz?

Araştırma, bu dersi almaya gönüllü İngilizce öğretim görevlileri ve öğretmenleriyle birlikte yapılacaktır. Bu araştırma kapsamında katılımcılardan bu eğitimi tamamlamaları, eğitim öncesi ve sonrasında verilecek anketleri yapmaları ve birebir görüşmelere katılmaları beklenmektedir.

Katılımınızla ilgili bilmeniz gerekenler:

Bu çalışmaya katılmak tamamen gönüllülük esasına dayalıdır. Herhangi bir yaptırıma veya cezaya maruz kalmadan çalışmaya katılmayı reddedebilir veya çalışmayı bırakabilirsiniz. Araştırma esnasında cevap vermek istemediğiniz sorular olursa o soruları yapmayıp sorular hakkında konuşmayı reddedebilirsiniz.

Araştırmaya katılanlardan toplanan veriler tamamen gizli tutulacak, veriler ve kimlik bilgileri herhangi bir şekilde eşleştirilmeyecektir. Katılımcıların isimleri bağımsız bir listede toplanacaktır. Ayrıca toplanan verilere sadece araştırmacılar ulaşabilecektir. Bu araştırmanın sonuçları, katılımcıların kimlikleri gizli tutulmak koşuluyla, bilimsel ve profesyonel yayınlarda veya eğitim amaçlı kullanılabilir.

Araştırmayla ilgili daha fazla bilgi almak isterseniz:

Çalışmayla ilgili soru ve yorumlarınızı araştırmacıya
adresinden iletebilirsiniz.

Yukarıdaki bilgileri okudum ve bu çalışmaya tamamen gönüllü olarak katılıyorum.
(Formu doldurup imzaladıktan sonra uygulayıcıya geri veriniz).

    İsim Soyad   Tarih   İmza

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K. APPROVAL OF METU HUMAN SUBJECTS ETHICS COMMITTEE

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER

ORTA DOĞU TEKNİK ÜNİVERSİTESİ
MIDDLE EAST TECHNICAL UNIVERSITY

DUMLUPINAR BULVARI 06800
ÇANKAYA ANKARA/TURKEY

21 Ocak 2020

Konu: Değerlendirme Sonucu

Gönderen: ODTÜ İnsan Araştırmaları Etik Kurulu (İAEK)

İlgi: İnsan Araştırmaları Etik Kurulu Başvurusu

Sayın Dr.Öğr.Üyesi Nur ÇAKIR

Danışmanlığını yaptığınız **Emrah Baki BAŞOĞLU'nun "Dijital Oyun Destekli Dil Öğrenimine Yönelik Bir Mobil Mesleki Gelişim Programının Yabancı Dil Öğretim Görevlileri Üzerine Etkisi"** başlıklı araştırması İnsan Araştırmaları Etik Kurulu tarafından uygun görülmüş ve (protokol numarası ile onaylanmıştır.

Saygılarımızla bilgilerinize sunarız.

Prof.Dr. Mine MISIRLISOY

Başkan

Prof. Dr. Tolga CAN
Üye

Doç.Dr. Pınar KAYGAN
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Üye

L. CURRICULUM VITAE

PERSONAL INFORMATION

Surname, Name: Başoğlu, Emrah Baki

EDUCATION

Degree	Institution	Year of Graduation
PhD	METU Curriculum and Instruction	2022
MSc	BEUN Curriculum and Instruction	2010
BA	Hacettepe University, ELT	2003

WORK EXPERIENCE

Year	Place	Enrollment
2004 - Present	Bulent Ecevit University	Language Instructor
2019 - Present	Indiana University	Language Instructor
2015 - 2019	Arizona State University	Language Instructor
2011 - 2012	Utah University	Foreign Language Teaching Assistant
2003 – 2004	MoNE	English Teacher

LANGUAGES

Turkish – Native

English – Fluent

PUBLICATIONS

1. Basoglu, E. B. & Cakir, N. (2021) Designing and implementing a prototype for mobile teacher professional development. *Proceedings of the 8th International Congress on Curriculum and Instruction Curriculum Studies in Life Long Learning*. Available at https://icci-epok.maku.edu.tr/files/bildiri-kitabi.pdf

2. Basoglu, E. B. & Akdemir, Ö. (2010). A comparison of undergraduate students' English vocabulary learning: Using mobile phones and flash cards. *TOJET: The Turkish Online Journal of Educational Technology*, 9(3). Full Article: http://www.tojet.net/articles/v9i3/931.pdf

3. Basoglu, E. B. (2009). Trendy English Grammar 1-2 (Book Chapter). Trend ELT

HONORS AND AWARDS

1. Fulbright Foreign Language Teaching Assistant (FLTA) Scholarship - The Fulbright Program 2011
2. Excellence in Instruction Award – Indiana University Hamilton Lugar School of Global and International Studies 2020

DİJİTAL OYUNLA ZENGİNLEŞTİRİLMİŞ DİL ÖĞRENİMİ ÜZERİNE BİR MOBİL ÖĞRETMEN MESLEKİ GELİŞİM DERSİ

Giriş

Günümüzde öğrenciler dijital yerliler olarak doğmaktadır ve tüm yaşamlarını bilgisayarlar, video oyunları, kameralar, cep telefonları ve diğer teknolojik oyun cihazlar doldurmaktadır (Prensky, 2003). Teknolojik ilerleme ve neredeyse herkesin bir bilgisayara veya akıllı telefona sahip olmasıyla birlikte, 'ticari kullanıma hazır' dijital oyunlar küçük bir topluluğa hitap etmekten daha çok dünyanın birçok ülkesinde milyonlarca insan tarafından oynanan küresel bir fenomen haline geldi. "Oyuncular" olarak adlandırılan yeni bir topluluk ortaya çıktı (Walsh, 2010) ve bu da yeni bir çok dilli ve kültürler arası küresel gerçeklik yarattı.

Gençlerin ticari dijital oyunlar oynamak için bu kadar fazla zaman harcaması araştırmacıların da dikkatini çekmiştir ve bu potansiyeli dil öğreniminde kullanmak için günümüze kadar birçok çalışma yapılmıştır (Ali et al., 2018; Bolliger et al., 2015; Cardoso et al., 2017; Ebrahimzadeh & Alavi, 2017; Eshelman, 2017). Oyunların bu potansiyeli, yabancı dil öğretmenlerinin dil öğretiminde kullanabilecekleri yeni bakış açıları oluşturmuştur. Bununla birlikte, ticari dijital oyunların dil öğrenimindeki etkinliği, öğretim tasarımının kalitesine güçlü bir şekilde bağlıdır ve bu da dil öğretmenlerinin oyunları müfredata entegre etme yetkinliği konusunu önemli bir hale getirir. Dijital oyunların yabancı dil öğrenimi üzerindeki etkisini artırmak ve daha verimli öğrenme ortamları oluşturmak için yabancı dil öğretmenlerini dijital oyun olgusu hakkında bilgilendirmek ve potansiyeli hakkında farkındalık yaratmak çok önemlidir. Ancak ticari hazır oyunların dil öğreniminde kullanımına odaklanan araştırmalar incelendiğinde, daha önce Türk okullarında yapılmış araştırmaların sınırlı kaldığı görülmüştür (Yaşar, 2018).

Öğretmen eğitiminde yapılan araştırmalar, öğretmen yeterliğine katma bir değer getirmenin en etkili yolunun öğretmenler için etkili mesleki gelişim fırsatları yaratmak olduğunu ortaya koymaktadır (Kempen & Steyn, 2015; Opfer & Pedder, 2011). Son 5 yılda dil öğretmenlerinin mesleki gelişimi, eğitim araştırmalarında önemli konulardan biri olmuştur ve dünyada yabancı dil öğretmenlerinin mesleki gelişimi konusunda çeşitli çalışmalar bulunabilir (Qi & Wang, 2018; Santos, 2016; Sierra Piedrahíta, 2018). Türk üniversiteleri bağlamında dil öğretim elemanlarının mesleki gelişimlerine yönelik olarak, dil öğretim görevlilerinin mesleki gelişim ihtiyaçları ve katıldıkları mesleki gelişim uygulamaları konusundaki ihtiyaçları ve görüşleri hakkında az sayıda araştırma yapılmıştır (Kulavuz-Onal & Tatar, 2017; Sarac, 2015).

Yabancı dil öğretmenleri için teorik olarak birçok mesleki gelişim fırsatı mevcut olsa da (Mitton-Kukner & Akyuz, 2012), ara tatillerde yapılan az sayıda mesleki gelişim eğitimleri dışında, yabancı dil öğretmenleri çeşitli nedenlere bağlı olarak sürekli olarak anlamlı mesleki gelişim fırsatları bulamamaktadır (Elliott, 2017). Öğretmenler, bir arada bulunmalarını ve işbirlikçi bir profesyonel öğrenme ortamı oluşturmalarını engelleyen günlük yoğun programları nedeniyle mesleki gelişim uygulamalarına katılmakta sorun yaşamaktadır (Casteel & Ballantyne, 2010; Mockler & Groundwater-Smith, 2009). Ek olarak, öğretmenler sürekli hareket halindedir. Masalarında oturmak veya işbirlikçi bir ortamda yüz yüze veya çevrimiçi PD fırsatları yakalamak için yeterince zamanları yoktur. Çalışma ortamları, farklı zamanlarda farklı yerlerde kendi mesleki gelişimlerine zaman ayırmalarını engeller (Aubusson et al., 2009).

Yabancı dil öğretmenlerinin karşılaştığı bu zorluklara ek olarak, Covid-19 pandemisinin olası etkisinin öğretmenlerin sürekli mesleki gelişim fırsatları üzerinde uzun vadeli önemli etkileri olacağı öngörülmektedir. Pandemi tehdidini en aza indirmek için daha fazla önlem alma riskinin yanı sıra eğitimde öngörülemeyen bu tür bir aksama için alternatif bir plan hazırlanmasına ihtiyaç duyulması nedeniyle, araştırmacılar uzaktan pedagojiler üzerine geliştirilen öğretmen mesleki gelişim programlarına daha fazla odaklanmalıdır. Gelecekte öğretmenlere giderek daha fazla çevrimiçi mesleki gelişim eğitimlerinin sunulacağı ve bunun Covid sonrası yeni dönemin ayrılmaz bir parçası olacağı öngörülmektedir (Bragg et al., 2021).

Mobil teknolojilerin öğretmen mesleki gelişiminde kullanımı tüm dünyada artmakta ve geleneksel öğrenme ve öğretme yöntemleri her zaman ve her yerde öğrenme fırsatlarına dönüşmeye başlamıştır. Yabancı dil öğretmenlerine daha fazla mesleki gelişim fırsatları sunmak için geleneksel öğretmen mesleki gelişim yöntemlerine alternatif olarak yeni ve yaygın teknolojiler yer almaya başlamıştır (Campbell et al., 2013). Bununla birlikte, Royle et al. (2014), mobil teknolojinin eğitimdeki rolünün hala çok net olmadığını ve güvenilir bir sonuca varmak için mobil öğretmen gelişimine ilişkin yeterli örnek bulunmadığını ileri sürmüştür. Ayrıca, dünyada mTPD' ye artan ilgiye rağmen, Türkiye'de sadece birkaç araştırma, dil öğretmenlerinin mobil platformlarda yapılan mesleki gelişim uygulamalarına odaklanmıştır (Baran, 2014; Keskin & Kuzu, 2015).

Mobil öğrenme gibi yenilikçi dijital yaklaşımları öğretmen mesleki gelişimine entegre etmek, öğrenme ve öğretme süreçlerinin öğretim çerçevesine anlamlı bakış açıları verebilir. Ancak mobil öğrenme programları, daha önce mobil derslerle ilgili deneyimi olmayan öğretmenlerde korku ve kaygıya neden olabilir (Dunst & Raab, 2010; Yoder, 2001). Bu anlamda, düşük kalitede tasarlanmış bir mobil öğrenme programını deneyimlemek, mobil öğrenme deneyimine hiç sahip olmamaktan daha kötü bir etki yaratabilir. Öğretmenlerin bu tür programlara yönelik önyargıları, mesleki gelişim programları öğretmenlerin ihtiyaçlarına yönelik olarak etkin bir şekilde tasarlanırsa azaltılabilir (Bereiter, 2002; Garet et al., 2001). Ancak, bu alandaki literatür gözden geçirildiğinde, mobil kaynakların hızlı tüketimine rağmen mobil öğretmen mesleki gelişim programlarının tasarımı ve uygulanması için en iyi uygulamalar hakkında çok az şey bilindiği anlaşılmıştır (Baran, 2014; Borko, 2004; Dede et al., 2009; Fisher et al., 2010; Hubbard, 2008; Kearney et al., 2012; Liaupsin, 2002; Lieberman & Mace, 2010; Naismith et al., 2004).

Amaç

Bu çalışmada tasarlanmış olan Dijital Oyunla Geliştirilmiş Dil Öğrenimi dersi, ticari olarak hazırlanmış dijital oyunlarını dil öğrenimine entegre etmek için yabancı dil öğretmenlerine yenilikçi bir mesleki gelişim becerisi kazandırmıştır. Bu bağlamda, bu çalışmanın amacı, dijital oyun destekli dil öğrenimi üzerine bir mobil öğretmen mesleki gelişim dersi tasarlamak ve geliştirmek, ve yabancı dil öğretmenlerinin mobil öğretmen profesyonel gelişim dersine ilişkin algılarını ve Dijital Oyunla Geliştirilmiş Diş Öğrenimi yaklaşımı hakkındaki algı ve bilgilerini araştırarak değerlendirmektir. Aşağıda verilen araştırma soruları bu çalışmaya rehberlik etmiştir:

1. Yabancı dil öğretim elemanlarının Dijital Oyunla Geliştirilmiş Dil Öğrenimi konusunda verilen mobil öğretmen mesleki gelişim dersine yönelik algıları nelerdir?

   1.1. Dijital Oyunla Geliştirilmiş Dil Öğrenimi konusunda verilen mobil öğretmen mesleki gelişim dersinin içeriğine ilişkin yabancı dil öğretim elemanlarının algıları nelerdir?

   1.2. Dijital Oyunla Geliştirilmiş Dil Öğrenimi konusunda verilen mobil öğretmen mesleki gelişim dersinin kullanılabilirliğine ilişkin yabancı dil öğretim elemanlarının algıları nelerdir?

   1.3. Dijital Oyunla Geliştirilmiş Dil Öğrenimi konusunda verilen mobil öğretmen mesleki gelişim dersinin etkililiğine ilişkin yabancı dil öğretim elemanlarının algıları nelerdir?

2. Mobil öğretmen mesleki gelişim dersinin uygulanmasından sonra yabancı dil öğretim elemanlarının dijital oyunların dil öğreniminde kullanımına ilişkin algıları ne ölçüde değişmiştir?

3. Mobil öğretmen mesleki gelişim dersi sonunda yabancı dil öğretim elemanlarının Dijital Oyunla Geliştirilmiş Dil Öğrenimi hakkındaki bilgileri ne ölçüde değişmiştir?

Yöntem

Bu çalışma, iç tutarlılık kriterlerini karşılaması gereken öğretim programları, süreçleri ve ürünleri tasarlama, geliştirme ve değerlendirmeye yönelik sistematik bir çalışma olarak tanımlanan Tip 1 tasarım ve geliştirme araştırma metodolojisini kullanmıştır (Seels & Richey, 1994). Araştırmacının bu çalışmadaki amacı, Tip 1 tasarım ve geliştirme araştırma tasarımını kullanarak analiz, tasarım, geliştirme ve değerlendirme aşamalarını içeren döngüsel bir süreçte farklı prototipler sunmaktır ve tüm adımları ayrıntılı bir şekilde açıklayarak bir ürün ortaya konmayı amaçlamaktadır. Ayrıntılı açıklanan bu aşamaları değerlendiren ve benzer tasarım ve geliştirme projeleriyle uğraşan diğer araştırmacılar bu çalışmanın sonuçlarından yararlanabilir.

Bu çalışmada, araştırmacının tasarım araştırma ilkeleri doğrultusunda izlediği bazı adımlar bulunmaktadır (Reeves, 2006). İlk olarak, araştırmacı öğretim problemlerini belirlemek için öğretmenlerle iş birliği içinde çalışılmıştır. Daha sonra mevcut tasarım ilkeleri ve yenilikçi teknolojiler doğrultusunda prototipler geliştirilmiştir. İlk prototipin uygulanmasından sonra, ürün yinelenen döngülerde test edilmiştir. Son olarak, uygulama döngüleri ile ilgili deneyimlerin paylaşılması için çalışmanın sonuçları rapor edilmiştir.

Bu çalışma iki prototip ve bir nihai ürün uygulamasını içermektedir. Her aşama, ADDIE öğretim tasarımı modelinin analiz, tasarım, geliştirme, uygulama ve değerlendirme adımlarını içerir. Prototip aşamalarında dersi test etmek ve dersin kalitesini artırmak için gerekli değişiklikleri yapmak için hızlı prototipleme yaklaşımı kullanılmıştır.

Öğretim tasarımının analiz aşamasında dil eğitmenlerinin öğrenme aktivitelerinde ne öğrenmesi gerektiğini belirlemeye odaklanılmıştır. Bu adımda, araştırmacı mesleki gelişim dersinin konusuna karar vermek için araştırma bağlamının içerik ve bağlam analizini yürütmüştür. Tasarım adımı, öğrencilerin başarılı olabilmeleri için ihtiyaç duydukları bilgi ve becerilerin, uygulanacak öğretim hedeflerinin ve öğrenme stratejilerinin ve mesleki gelişim dersinde kullanılacak mobil öğrenme çerçevesinin

belirlenmesine yardımcı oldu. Tasarım aşamasında belirlenen tasarım ilkelerinden hareketle geliştirme aşamasında öğretim materyalleri geliştirilmiştir. Her döngünün uygulaması, Türkiye'deki farklı okullardan dil öğretmenleri ve öğretim görevlileri ile gerçekleştirilmiştir. Değerlendirme aşamasında katılımcılardan ders değerlendirme anketi, dijital oyunların öğretimde kullanımına ilişkin algı anketi, başarı testi, dereceli puanlama yönergesi ile ders planı değerlendirmesi ve görüşmeler yoluyla veriler toplanmıştır. Mobil öğretmen mesleki gelişim dersini geliştirmek ve programın tüm yönlerinin başarıya ulaşmasını sağlamak için, farklı prototiplerde ve süreç ve sonuç değerlendirmesi ile nihai ürünle ilgili sürekli geri bildirim ve veriler sağlandı.

Değerlendirme süreci, mobil öğretmen mesleki gelişim dersinin uygulanmasından önce ve sonra yürütülen çeşitli değerlendirme etkinliklerini içermektedir. Uygulama öncesinde dil öğretim elemanlarına dijital oyunların öğretimde kullanımına ilişkin algı anketi ve başarı testi verilmiştir ve derse başlamadan önce bu anketleri doldurmaları ve göndermeleri istenmiştir. Dersi bitirdikten sonra, ders değerlendirme anketi ile aynı anketler tekrar verilmiştir. Dersin, katılımcıların bilgilerini nasıl etkilediğini anlamak için ders planları dereceli puanlama yönergesi kullanılarak değerlendirilmiştir. Bu araçların verileri analiz edildikten sonra, rastgele seçilen katılımcılarla, ders hakkındaki görüşlerini daha derinden anlamak için görüşme yapılmıştır.

Bu çalışmanın amacı, araştırmanın nicel ve nitel bulgularını örneklemin seçildiği evrene genellemek değildir. Araştırmacı, Dijital Oyunla Geliştirilmiş Dil Öğrenimi üzerine bir mobil öğretmen mesleki gelişim dersi tasarlayarak, geliştirerek ve değerlendirerek, bu programa ilişkin veriler elde etmeyi amaçlamaktadır ve bu verilerin en etkili şekilde elde edilmesi için çalışmanın prototip aşamaları için amaçlı olarak katılımcıları prototip uygulamaları için belirlemiştir. Nihai ürün uygulaması için bir devlet üniversitesinde görev yapan dil öğretim görevlileri ile erişilebilir ve uygun oldukları için çalışmıştır (Cohen et al., 2007). Tasarım ve gelişimsel araştırma çalışmaları farklı yinelemeli uygulama döngüleri gerektirdiğinden, bu çalışmanın farklı uygulama aşamalarına üç katılımcı grubu dahil edilmiştir. Uygun dil öğretim elemanlarını ve araştırmaya katılmaya istekli öğretmenleri seçmek için uygun ve ölçüt örnekleme stratejileri kullanılmıştır. Çalışmaya 8'i ilk prototipte, 11'i ikinci prototipte

ve 25'i nihai ürün uygulamasında olmak üzere toplam 44 yabancı dil öğretmeni ve öğretim elemanı katılmıştır. Katılımcıların tamamı Türk üniversitelerinde ve devlet okullarında ikinci dil olarak İngilizce öğretmektedir. Çalışma COVID-19 salgını sırasında yapıldığından, tüm üniversiteler ve diğer okul seviyeleri tüm akademik yıl boyunca çevrimiçi eğitim veriyordu. Birinci ve ikinci prototip uygulamalarının katılımcıları, Türkiye'nin farklı bölgelerindeki farklı okullarda öğretmenlik yapıyordu ve hiçbirinin çalışma sırasında yüz yüze dersleri yoktu. Mobil öğretmen mesleki gelişim dersinin son halinin uygulanması Türkiye'de bir devlet üniversitesinde 25 İngilizce öğretim görevlisi ile gerçekleştirilmiştir.

Araştırmada kullanılan her bir ölçümün geçerliliğini ve güvenilirliğini değerlendirmek için araştırmacı, Guba ve Lincoln (1981) tarafından önerilen sürekli katılım, veri çeşitlemesi, akran bilgilendirmesi ve üye kontrolü tekniklerini kullanmıştır. Mevcut çalışma, bulgularını daha geniş bir evrene genelleme niyetinde değildir. Ancak, araştırmacı, benzer tasarım ve geliştirme çalışmaları yürüten diğer araştırmacıların projenin hangi bölümünden yararlanabileceklerine karar verebilmeleri için tüm araştırma sürecinin derinlemesine, ayrıntılı ve net bir tanımını sağlamıştır.

Görünüş geçerliğini sağlamak için Kvale (1996) tarafından geliştirilen aşamalara göre bir görüşme protokolü hazırlanmış ve görüşme protokolü iki araştırmacıya uzman görüşü alınmak üzere gönderilmiştir. Başarı testi, Simonson, v.d. (1987) tarafından önerilen yönergelere göre geliştirilmiştir. Araştırmacı farklı soru setleri oluşturmuş ve başarı testi uzman görüşü için üç araştırmacıya gönderilmiştir. Araştırmacı kapsamlı bir literatür taraması yapmış ve katılımcıların ders planlarını değerlendirmek için bazı kriterler belirlemiştir. Daha sonra ders planı değerlendirme rubriğinin ilk taslağını oluşturmuş ve danışmanı ile tekrar gözden geçirmiştir. Daha sonra dereceli puanlama anahtarı uzman görüşü için iki farklı uzmana gönderilmiştir. Aracın puanlayıcılar arası güvenirliği, değerlendirme aşamasında iki işaretleyici kullanılarak sağlanmıştır.

Araştırmacı, tanımlayıcı istatistikler, Wilcoxon işaretli sıra testi, eşleştirilmiş gruplar t testi ve bağımlı grup t testi dahil olmak üzere çalışmanın nicel analiz aşamasının farklı aşamalarında birden fazla nitel analiz yöntemi kullanmıştır. Birinci araştırma

sorusunda veriler, frekans, yüzde, ortalama ve standart sapma puanları hesaplanarak betimsel olarak analiz edilmiştir. İkinci araştırma sorusunda, Prototip 1'de mTPD dersi öncesi ve sonrasında katılımcıların algılarında anlamlı bir değişiklik olup olmadığını belirlemek için Wilcoxon işaretli sıra testi yapılmıştır. Prototip 2 ve nihai ürün uygulamasında Shapiro-wilk testi normal dağılımı kontrol etmek için yapılmıştır ve normal olmayan herhangi bir bulgu göstermemiştir. Bu sonuca dayalı olarak, mTPD dersi öncesi ve sonrasında katılımcıların algılarında anlamlı bir değişiklik olup olmadığını belirlemek için eşleştirilmiş gruplar t testi yapılmıştır. Üçüncü araştırma sorusunda, Prototip 1'de mTPD dersinden sonra katılımcıların başarı testi puanlarının önemli ölçüde değişip değişmediğini değerlendirmek için bir Wilcoxon işaretli sıra testi yapılmıştır. mTPD dersinden sonra başarı testi puanları önemli ölçüde değişiklik göstermiştir. Başarı testi puanlarına ek olarak, katılımcıların mTPD dersi hakkındaki bilgileri, ders planları değerlendirilerek incelenmiştir. Ders planlarını değerlendirmek için bütüncül bir dereceli puanlama anahtarı kullanılmıştır. Verileri yorumlamak ve katılımcıların ders planı aktivitesindeki başarıları hakkında bilgi sağlamak için betimsel analiz kullanılmıştır. Her üç döngüyü karşılaştırmak ve gruplar arasında istatistiksel olarak anlamlı fark olup olmadığını belirlemek için Kruskal-Wallis testi ve Dunn testi yapılmıştır. Bu test, 3 farklı döngüde anlamlı bir fark bulduğunda, hangi grupların önemli ölçüde farklı olduğunu tam olarak belirlemek için Dunn testi kullanılmıştır.

Nitel veri analizi, katılımcıların mTPD dersi hakkındaki algılarını daha derinden anlamak için yapılan görüşmelerin analizini içermektedir. Her uygulamadan sonra veri kaynakları araştırmacı tarafından gözden geçirilmiş ve yazıya dökülmüştür. Görüşme analizi için, araştırma sorusuna derinlemesine açıklama sağlayan veriler içindeki temaları belirlemek ve raporlamak için tematik analiz yapılmıştır.

Bulgular

Prototip 1 Bulguları

İçerikle ilgili olarak, nicel analiz sonuçları öğretmenlerin çoğunun videolar, derse hazırlık aktiviteleri, değerlendirme bölümü ve uygulama aktivitelerini içeren ders içeriğinden memnun olduğunu göstermiştir. Öğretmenlerin içerikle ilgili yaşadığı en belirgin memnuniyetsizliğin tartışma forumları olduğu görülmüştür.

Öğretmenlerin içeriğe ilişkin algılarının nitel analizinde iki tema bulunmuştur Bunlar memnuniyet ve öneri temalarıdır. Memnuniyet teması altında yedi alt tema bulunmaktadır. Bu alt temalar şunlardır: kurs içeriğinin beklentileri karşılaması, içerik derinliğinden memnuniyet, çoklu içerik türleri ve biçimlerinden memnuniyet, açık ve etkili yönergelerden memnuniyet, derse hazırlık aktivitelerinden memnuniyet, videolardan memnuniyet ve ekstra materyallerden memnuniyet. Öneriler teması altında iki alt tema vardır. Bu alt temalar şunlardır: yeni bir ders planı oluşturmada destek ihtiyacı ve farklı oyun türleri eklenebilir.

İçerikle ilgili olarak, nicel analiz sonuçları öğretmenlerin çoğunun videolar, derse hazırlık aktiviteleri değerlendirme bölümleri ve uygulama aktivitelerini içeren ders içeriğinden memnun olduğunu göstermiştir. Öğretmenlerin içerikle ilgili yaşadığı en belirgin memnuniyetsizliğin tartışma forumları olduğu ortaya çıkmıştır.

Öğretmenlerin içeriğe ilişkin algılarının nitel analizi iki tema sağlamıştır: memnuniyet ve öneriler. Memnuniyet temasında yedi alt tema bulunmaktadır: kurs içeriğinin beklentileri karşılaması, içerik derinliğinden memnuniyet, çoklu içerik türleri ve biçimlerinden memnuniyet, açık ve etkili talimatlardan memnuniyet, derse hazırlık aktivitelerinden memnuniyet, videolardan memnuniyet ve ekstra materyallerden memnuniyet. Öneriler temasında iki alt tema bulunmaktadır: yeni bir ders planı oluşturmada destek ihtiyacı ve farklı oyun türlerinin eklenebilirliği.

Mobil öğretmen mesleki gelişim dersinin kullanılabilirliği ile ilgili olarak, nicel analiz sonuçları, katılımcıların çoğunun dersin işlevselliğinden memnun olduğunu, ancak katılımcıların yarısının ders arayüzünün kolaylığı konusunda tereddüt ettiğini göstermiştir. Nitel analiz bulguları iki ana tema sağlamıştır: algılanan zorluklar ve öneriler. İlk temada dört alt tema bulunmaktadır: ekran boyutunun sınırlayıcı olması, hareketlilik nedeniyle konsantrasyon güçlüğü, mobil cihazlarda yazım hatalarını düzeltme zorluğu ve mobil cihazlarda ödev paylaşımının kolay olmaması. İkinci temada iki alt tema bulunmaktadır: ders navigasyonunun geliştirilmesi gerekliliği ve bazı sorulardaki cümlelerin kısaltılması gerekliliği.

Mobil öğretmen mesleki gelişim dersinin algılanan etkiliği ile ilgili olarak, nicel analiz bulguları, katılımcıların yarısının gelecekte başka bir mobil öğretmen mesleki gelişim dersi almayı düşündüğünü gösterdi. Katılımcıların çoğu, yüz yüze bir öğretmen mesleki gelişim dersinde öğrenecekleri kadar bilgi öğrendiklerini ve mobil öğretmen mesleki gelişim derslerini yüz yüze derslere tercih edeceklerini belirtti. Çoğu katılımcı, mobil öğrenmenin öğretmen mesleki gelişim programları için verimli ve uygun bir yaklaşım olduğu konusunda hemfikirdi. Nitel analiz bulguları, mobil öğretmen mesleki gelişim dersinin algılanan etkiliği ile ilgili iki tema sağlamıştır: algılanan faydalar ve öneriler. Algılanan faydalar teması altında yedi alt tema yer almaktadır. Bu alt temalar şunlardır: hareketlilik sayesinde her zaman ve her yerde öğrenmenin mümkün olması, bağımsız öğrenmenin etkin kullanımı, dijital oyunların özgün öğrenme kaynakları olarak kullanılmasını sağlaması, öğrencilere ulaşma imkanı sağlaması, teorinin pratiğe dökülmesini sağlaması, etkili yönlendirici ilkeler sağlaması ve alanlarında uzman kişilerden bilgi sağlaması. İkinci tema olan öneriler temasının altında dört alt tema yer almıştır. Bunlar kurs ilerlemesi hakkında geri bildirim ihtiyacı, mobil öğretmen mesleki gelişim dersinin hedef grubu, daha fazla zaman ihtiyacı ve işbirliği sağlama ihtiyacıdır.

İkinci araştırma sorusu, mobil öğretmen mesleki gelişim dersinin uygulanmasından sonra yabancı dil öğretim elemanlarının dijital oyunların dil öğreniminde kullanımına ilişkin algılarındaki değişimi araştırmıştır. Analiz sonuçları, katılımcıların mobil öğretmen mesleki gelişim dersinden önce (Mdn=4) ve sonra (Mdn=9) sınıflarda dijital

oyunların kullanımına ilişkin deneyimlerine ilişkin algılarında önemli bir değişiklik olduğunu göstermiştir (T = 36, p = 0.012, r = 0.63). Diğer yapılardaki değişim analiz sonuçlarına göre önemsiz bulunmuştur.

Üçüncü araştırma sorusu, dijital oyunlarla zenginleştirilmiş yabancı dil öğrenimi üzerine olan bir mobil öğretmen mesleki gelişim dersinin, katılımcıların dijital oyunlarla zenginleştirilmiş yabancı dil öğrenimi hakkındaki bilgilerine teori ve pratikte ne kadar katkıda bulunduğunu araştırmıştır. Başarı testinin sonuçları anlamlı bir değişim olduğunu göstermiştir (Z = 2.21, p < .05, r= .78). Yani katılımcıların başarıları mobil öğretmen mesleki gelişim dersini aldıktan sonra önemli ölçüde artmıştır. Ders planı hazırlayan dört katılımcıdan hiçbiri tam puan alamamıştır. Ders planı aktivitesinde konuyu önemli ölçüde anladığını gösteren bir katılımcı bulunmaktadır. İki katılımcı ders planlarında PCaRD modelinin bileşenlerini kısmen uygulamış ve dersin aşamalarıyla ilgili az sayıda etkinlik geliştirmiştir.

Prototip 2 Bulguları

İlk araştırma sorusu, katılımcıların dijital oyunlarla zenginleştirilmiş yabancı dil öğrenimi üzerine olan bir mobil öğretmen mesleki gelişim dersinin içeriği, kullanılabilirliği ve algılanan etkililiği hakkındaki algılarını araştırmıştır. Mobil öğretmen mesleki gelişim dersinin içeriği ile ilgili olarak, nicel veri analizinden elde edilen bulgular, katılımcıların çoğunun mobil öğretmen mesleki gelişim dersindeki derse hazırlık aktiviteleri, videolu anlatımlar, makaleler, başarı testleri, değerlendirme aktiviteleri ve dereceli puanlama anahtarlarının içeriğinden memnun olduklarını göstermiştir. İlk prototipte olduğu gibi, ikinci prototip uygulamasında yer alan katılımcılar da tartışma forumları hakkında tartışmalı görüşler paylaşmışlardır. Tartışma forumlarının konu ile ilgili başkalarının fikirlerini öğrenmelerine yardımcı olmadığını belirten katılımcılar olmuştur.

Mobil öğretmen mesleki gelişim dersinin içeriğiyle ilgili görüşmelerden elde edilen bulgular iki tema ortaya çıkarmıştır: memnuniyet ve öneriler. Memnuniyet teması altında dokuz alt tema bulunmaktadır. Bunlar ders içeriğinin beklentileri karşılaması, içerik sıralamasından memnuniyet, içeriğin derinliğinden memnuniyet, açık ve etkili

yönergelerden memnuniyet, program hedeflerinden memnuniyet, derse hazırlık aktivitelerinden memnuniyet, videolardan memnuniyet, uygulama aktivitelerinden memnuniyet ve değerlendirme aktivitelerinden memnuniyettir. Öneriler temasının altında üç alt tema yer almıştır. Bunlar yeni içerik öğretirken daha fazla girdi ihtiyacı, yeni bir ders planı oluşturmada destek ihtiyacı ve farklı bir oyun türünün eklenilmesi önerisidir.

Mobil öğretmen mesleki gelişim dersinin kullanılabilirliği ile ilgili olarak, katılımcıların çoğu ders ara yüzünün kolaylığı hakkında olumlu görüşler belirtirken, mobil öğretmen mesleki gelişim dersinin kolaylığı konusunda hala tereddütlü olan bazı katılımcılar olmuştur. Tüm katılımcılar programın işlevselliğinden memnun kalmışlardır. Görüşmeler iki tema ortaya çıkarmıştır. Bunlar algılanan zorluklar ve önerilerdir. Algılanan zorluklar teması altında iki alt tema bulunmaktadır. Bunlar ekran boyutunun sınırlayıcı olması ve cihaz gereksinimleri nedeniyle oyunu indirmek konusunda yaşanan zorluklardır. Öneriler temasının altında sadece bir alt tema bulunmaktadır. Bu alt tema ders navigasyonunun geliştirilmesi önerisidir..

Mobil öğretmen mesleki gelişim dersinin algılanan etkililiği ile ilgili olarak, tüm katılımcılar yüz yüze bir öğretmen mesleki gelişim dersinde öğrenebilecekleri kadar çok şey öğrendiklerini ve gelecekte başka bir mobil öğretmen mesleki gelişim dersi almayı düşündüklerini belirtmişlerdir. Katılımcıların çoğu mobil öğretmen mesleki gelişim derslerini yüz yüze derslere tercih ettiklerini belirtmişlerdir. Nitel analiz iki tema sağlamıştır. Bunlar algılanan faydalar ve önerilerdir. Algılanan faydalar teması altında yedi alt tema yer almaktadır. Bunlar hareketlilik sayesinde her zaman ve her yerde öğrenmenin mümkün olması, bağımsız öğrenmenin etkin kullanımı, dijital oyunların özgün öğrenme kaynakları olarak kullanılmasını sağlaması, öğrencilere ulaşma imkanı sağlaması, teorinin pratiğe dökülmesini sağlaması, alanlarında uzman kişilerden bilgi sağlaması ve pedagojik bilgi ve öğrenme sağlamasıdır. Öneriler teması altında üç alt tema bulunmaktadır. Bunlar mobil öğretmen mesleki gelişim dersinin hedef grubu, daha fazla zaman ihtiyacı ve işbirliği sağlama ihtiyacıdır.

İkinci araştırma sorusu, mobil öğretmen mesleki gelişim dersinin uygulanmasından sonra dil öğretim elemanlarının dijital oyunların dil öğreniminde kullanımına ilişkin algılarındaki değişimi araştırmıştır. Analiz sonuçları, mobil öğretmen mesleki gelişim dersinden önce (M = 11.64, SD = 3.04) ve sonra (M = 8.36, SD = 3.04) katılımcıların dijital oyunların kullanışlılığına ilişkin algılarında önemli bir değişiklik olduğunu göstermiştir (t (10) = 2.92, p = 0.015). Katılımcıların dijital oyunların öğretimde kullanım kolaylığına ilişkin algı puanları da son testte (M = 3.36, SD = 1.54) ön teste (M = 6.18, SD = 1.03), göre anlamlı derecede düşük çıkmıştır (t(10) = 4.95, p = 0.001). Katılımcıların dijital oyunların öğrenme fırsatlarına ilişkin algıları ön test (M = 12.64, SD = 2.80) ve son testte (M = 8.91, SD = 2.55) önemli ölçüde değişmiştir (t(10) = 2.98, p = 0.014). Diğer yapılardaki değişim analize göre önemsiz bulunmuştur.

Üçüncü araştırma sorusu, dijital oyunlarla zenginleştirilmiş yabancı dil öğrenimi üzerine olan bir mobil öğretmen mesleki gelişim dersinin katılımcıların dijital oyunlarla zenginleştirilmiş yabancı dil öğrenimi hakkındaki bilgilerine teori ve pratikte ne kadar katkıda bulunduğunu araştırmayı amaçlamıştır. Başarı testleri sonuçları, ön test (M = 8.45, SD = 3.75) ve son testte (M = 16.55, SD = 2.58) önemli bir değişiklik olduğunu ve katılımcıların dijital oyunlarla zenginleştirilmiş yabancı dil öğrenimi hakkındaki bilgilerinin mobil öğretmen mesleki gelişim dersini aldıktan sonra önemli ölçüde arttığını göstermiştir (t(10) = 4.68, p = 0.001).

Mobil öğretmen mesleki gelişim dersinde ünite 3'ün sonunda, katılımcıların dijital oyunlarla zenginleştirilmiş yabancı dil öğrenimi hakkındaki pedagojik içerik bilgilerinin birçok yönünü içermesi beklenen bir ders planı oluşturmaları beklenmiştir. Katılımcıların çoğu, DGELL hakkında tam veya önemli bir öğrenme oranı göstermiş ve PCaRD modelinin tüm aşamalarını tutarlı bir şekilde kullanabilmişlerdir.

Son Uygulama Bulguları

Mobil öğretmen mesleki gelişim dersinin içeriği ile ilgili olarak, katılımcıların çoğu tartışma forumları da dahil olmak üzere her bir içerik alanı hakkında olumlu görüş bildirmiştir. Tematik analiz bulguları iki tema sağlamıştır. Bunlar memnuniyet ve önerilerdir. Memnuniyet teması altında dokuz alt tema bulunmaktadır. Bunlar

beklentilerin karşılanmış olması, içerik sıralamasından memnuniyet, içerik derinliğinden memnuniyet, çoklu içerik türleri ve formatlarından memnuniyet, açık ve etkili yönergelerden memnuniyet, derse hazırlık aktivitelerinden memnuniyet, videolardan memnuniyet ve değerlendirme aktivitelerinden memnuniyettir. Nihai ürünün içeriğiyle ilgili olarak görüşülen katılımcılardan alınan dönütler sonucu ortaya çıkan öneriler alt temasında tek bir öneri ortaya çıkmıştır. Görüşme yapılan üç kişi, yeni içerik öğretirken daha fazla girdiye ihtiyaç olduğunu vurgulamıştır.

Mobil öğretmen mesleki gelişim dersinin kullanılabilirliği ile ilgili olarak, katılımcıların çoğu ders arayüzünün kolaylığı ve işlevselliği hakkında olumlu algılar dile getirmişlerdir. Algılanan zorluklar ve öneriler, nihai üründe kullanılabilirlikle ilgili görüşme verilerinin analizinden sağlanan iki temadır. Birinci ve ikinci prototiplerde yapılan revizyonlar sayesinde, katılımcılar ekran boyutuyla ilgili yaşadıkları zorluk dışında başka bir zorluk yaşamamışlardır. Ayrıca bir görüşmeciden video bölümlerinde transkript eksikliği ile ilgili bir öneri alınmıştır.

Mobil öğretmen mesleki gelişim dersinin algılanan etkinliği ile ilgili olarak, katılımcıların çoğu, yüz yüze bir öğretmen mesleki gelişim dersinde öğrenebilecekleri kadar çok şey öğrendiklerini ifade etmişlerdir. Katılımcıların yarısı mobil öğretmen mesleki gelişim derslerini yüz yüze derslere tercih ettiklerini ve katılımcıların yarısından fazlası gelecekte başka bir mobil öğretmen mesleki gelişim dersi almak istediklerini belirtti. Görüşmelerin tematik analizinden iki ana tema ortaya çıkmıştır. Bunlar algılanan faydalar ve önerilerdir. Memnuniyet teması altında sekiz alt tema yer almaktadır. Bunlar hareketlilik sayesinde her zaman ve her yerde öğrenmenin mümkün olması, bağımsız öğrenmenin etkin kullanımı, dijital oyunların özgün öğrenme kaynakları olarak kullanılmasını sağlaması, öğrencilere ulaşma imkanı sağlaması, teorinin pratiğe dökülmesini sağlaması, etkili yönlendirici ilkeler sağlaması, pedagojik bilgi sağlaması ve diğer öğretmenlerle bağ kurulmasını sağlamasıdır. Öneriler teması iki alt tema içermektedir. Bunlar ders ilerlemesi hakkında geri bildirim ihtiyacı ve mTPD kursunun hedef grubudur.

İkinci araştırma sorusu, mobil öğretmen mesleki gelişim dersinin uygulanmasından sonra dil öğretim elemanlarının dijital oyunların dil öğreniminde kullanımına ilişkin algılarındaki değişimi araştırmıştır. Nicel analizin sonuçları üç önemli bulguya işaret etmektedir. İlk olarak, katılımcıların dijital oyunların öğretimde kullanım kolaylığına ilişkin algı puanları son testte (M = 5.04, SD = 1.77) ön teste (M = 7.56, SD = 1.69) göre anlamlı derecede düşük çıkmıştır (t(24) = 5.18, p = 0.000). İkinci olarak, katılımcıların dijital oyunların öğrenme fırsatlarına ilişkin algıları ön test (M = 13.08, SD = 3.13) ve son testte (M = 10.92, SD = 2.23) önemli ölçüde değişmiştir (t(24) = 3.04, p = 0.006). Son olarak, mobil öğretmen mesleki gelişim dersinin öncesi (M = 5.64, SD = 1.29) ve sonrasında (M = 4.68, SD = 1.41) katılımcıların dijital oyunların müfredatla ilişkili olmasına ilişkin algılarında önemli bir değişiklik olmuştur (t (24) = 2.39, p = 0.025). Diğer yapılardaki değişim analize göre önemsiz bulunmuştur.

Üçüncü araştırma sorusu, dijital oyunlarla zenginleştirilmiş yabancı dil öğrenimi üzerine olan bir mobil öğretmen mesleki gelişim dersinin katılımcıların dijital oyunlarla zenginleştirilmiş yabancı dil öğrenimi hakkındaki bilgilerine teori ve pratikte ne kadar katkıda bulunduğunu araştırmayı amaçlamıştır. Başarı testinin sonuçları, ön test (M = 6.92, SD = 3.95 ve son testte (M = 15.32, SD = 2.67) önemli bir değişiklik olduğunu göstermiştir (t(24) = 9.47, p = 0.000). Bu bulgudan, katılımcıların dijital oyunlarla zenginleştirilmiş yabancı dil öğrenimi hakkındaki bilgilerinin mobil öğretmen mesleki gelişim dersini aldıktan sonra önemli ölçüde geliştiği sonucuna varabiliriz.

Mobil öğretmen mesleki gelişim dersinde ünite 3'ün sonunda, katılımcıların dijital oyunlarla zenginleştirilmiş yabancı dil öğrenimi hakkındaki pedagojik içerik bilgilerinin birçok yönünü içermesi beklenen bir ders planı oluşturmaları bekleniyordu. Ders planları incelendiğinde katılımcıların çoğu, dijital oyunlarla zenginleştirilmiş yabancı dil öğrenimi hakkında tam veya önemli bir öğrenme gösterebilmiştir ve PCaRD modelinin tüm aşamalarını tutarlı bir şekilde kullanabilmişlerdir. Sadece bir katılımcı ders planında PCaRD modelinin bileşenlerini kısmen uygulamış ve modelin aşamalarını tutarsız bir şekilde geliştirmiştir.

Üç Uygulamanın Karşılaştırılması

Katılımcıların mobil öğretmen mesleki gelişim programı dersinin içeriğine ilişkin algıları, program yinelemeli döngülerde yeniden geliştirilirken olumlu yönde değişmiştir. Öte yandan, son uygulamaya katılan katılımcılar tartışma forumlarının diğer insanların konuyla ilgili görüşlerini öğrenmelerine yardımcı olduğunu düşünürken, prototiplere katılanlar bu konuda kararsız kalmışlardır.

Mobil öğretmen mesleki gelişim programı dersinin kullanılabilirlik özellikleri geliştirilirken, her yinelemeli döngüde katılımcıların algıları olumlu yönde değişmiştir. Ek olarak, birinci ve ikinci prototipteki katılımcılar, diğer öğrenenlerle iletişim kurmak için tartışma forumlarını kullanmakta sorun yaşamışlardır, ancak son uygulamada katılımcılar, tartışma forumlarında diğer katılımcılarla kolayca iletişim kurabildiklerini düşünmüşlerdir.

Katılımcıların çoğu, yüz yüze bir mobil öğretmen mesleki gelişim programı dersinde öğrenebilecekleri kadar bilgi öğrendiklerini düşünmüşlerdir. Ek olarak, mobil öğrenmenin öğretmen mesleki gelişim programları için verimli ve uygun bir yaklaşım olduğunu da düşünmüşlerdir. Ancak, katılımcılar mobil öğretmen mesleki gelişim programlarını yüz yüze mesleki gelişim programlarına tercih edip etmeyeceklerinden emin olmadıklarını ifade etmişlerdir.

Dijital oyunların sınıfta kullanımına ilişkin algı anketi de bazı bulgular göstermiştir. 'Kullanım kolaylığı' yapısının ön test puanları, gruplar arasında istatistiksel olarak anlamlı bir fark olduğunu göstermiştir ($\chi^2(2, N = 44) = 21.246$, $p<.001$). Prototip 1'deki puanlar (Mdn=4.50), son uygulama puanlarından (Mdn=12) önemli ölçüde farklılık göstermiştir. Ön testte kullanım kolaylığı yapısı ile ilgili maddeler arasında istatistiksel olarak anlamlı başka bir fark bulunmamıştır. 'Kullanım kolaylığı' yapısının son test puanları da ilk prototip, ikinci prototip ve son uygulama için önemli farklılıklar göstermiştir $\chi^2(2) = 21.639$, $p<.001$). Katılımcıların prototip 2'deki puanları (Mdn=8), prototip 1 (Mdn=4.50) ve son uygulamadan (Mdn=6) anlamlı ölçüde farklılık göstermiştir.

Ön testte yer alan "deneyim" yapısına ilişkin maddelerin sonuçları, farklı döngülerde anlamlı farklılık göstermiştir (χ^2(2, N = 44) = 10.945 , p = 0.004). Sonuçlar, ön testte prototip 1 (Mdn=4) ile son uygulama (Mdn=8) arasında anlamlı bir fark olduğunu göstermiştir. Ön testte deneyim yapısıyla ilgili maddeler arasında istatistiksel olarak anlamlı başka bir fark olmamıştır. Farklı döngülerdeki "deneyim" yapısı ile ilgili maddelerin son test puanları arasında da anlamlı bir fark bulunmuştur (χ^2(2, N = 44) = 12.300 , p = 0.002). Katılımcıların son uygulamadaki puanları (Mdn=4), prototip 1'deki puanlardan (Mdn=11.5) anlamlı ölçüde farklılık göstermiştir.

"Öğrenme fırsatları" yapısına ilişkin maddelerin ön test puanlarının farklı döngülerde önemli ölçüde farklı olduğu gözlemlenmiştir (χ^2(2, N = 44) = 21.971 , p = 0.000). Sonuçlar, prototip 2'yle (Mdn=5) prototip 1 (Mdn=6) arasında ve son uygulamayla (Mdn=5) prototip 1 arasında anlamlı bir fark göstermiştir. Öğrenme fırsatları yapısının son test puanları farklı döngülerde de anlamlı ölçüde farklılık göstermiştir (χ^2(2, N = 44) = 23.927 , p = 0.000). Her üç döngünün ikili karşılaştırması, prototip 2 (Mdn=5) ile prototip 1 (Mdn=11.5) ve son uygulama (Mdn=13) ile prototip 2 arasında anlamlı bir fark göstermiştir.

Bir diğer anlamlı farklılık ise "davranışsal niyet" yapısına ilişkin maddelerin ön test puanlarında gözlenmiştir (χ^2(2, N = 44) = 18.502 , p = 0.000). Katılımcıların prototip 1'deki puanları (Mdn=4), prototip 2 (Mdn=8) ve son uygulamadaki (Mdn=9) puanlardan anlamlı olarak farklılık göstermiştir. En son anlamlı farklılık ise "davranışsal niyet" yapısı ile ilgili maddelerin son test puanlarında gözlenmiştir (χ^2(2, N = 44) = 9.197 , p = 0.010). Katılımcıların prototip 1'deki puanları (Mdn=6), prototip 2'deki puanlardan (Mdn=2) anlamlı olarak farklılık göstermiştir

Başarı testi ön test puanları, gruplar arasında istatistiksel olarak anlamlı bir fark olmadığını göstermiştir. Başarı testinin son test puanları arasında da farklı döngülerde anlamlı bir fark bulunmamıştır.

İlk prototipin katılımcılarından geri bildirimler alınarak ders planı etkinliği yeniden geliştirilmiştir ve bu istatistikler diğer döngülerde yukarı yönlü değişiklik göstermiştir.

Son uygulamada katılımcılardan hiçbiri 1 puan almamıştır, bu da son uygulamadaki tüm katılımcıların ders planlarında PCaRD modelinin bileşenlerinin en azından bir kısmını uygulayabildiklerini göstermiştir.

Tartışma

Araştırma Sorusu 1

İçerik

Dersin içeriği, derse hazırlık aktiviteleri, video dersleri, yazılı metinler, ders aktiviteleri, uygulama aktiviteleri, tartışma forumu ve başarı testi gibi öğrenme için ihtiyaç duyulan çeşitli içeriklerden oluşmaktadır. Katılımcılardan içeriği kalite açısından değerlendirmeleri istendiğinde her döngüdeki tüm katılımcılar içeriğin açık ve mantıklı bir sıra ile verildiğini, videolu anlatımların, yazılı anlatımların ve uygulama aktivitelerinin öğrenmelerine yardımcı olduğunu belirtmişlerdir. Katılımcılar başarı testlerini de değerlendirmişler ve başarı testlerinin kendi öğrenmelerini değerlendirecek kadar iyi hazırlandığını belirtmişlerdir.

Mobil öğretmen mesleki gelişim programında videolar, makaleler gibi farklı öğrenme kaynakları vardı. Birden fazla içerik kullanmanın amacı, öğretmenlerin farklı tür materyallere erişmelerine ve nihayetinde öğrenmelerini ve anlamalarını derinleştirmelerine yardımcı olmaktır (Smylie, 1989). Öğrenme kaynaklarının çeşitliliği, öğrenenlere kendi öğrenmeleri hakkında karar verme fırsatı verildiğinde öğrenen özerkliğini de genişletir (Little, 2007). Konuyu uzman videoları izleyerek, makaleler okuyarak, ek kaynaklara erişerek veya çevrimiçi olarak kendi araştırmalarını yaparak öğrenebilirler.

İlk iki prototipte katılımcılar tartışma forumlarını etkin kullanamadıklarını sözlü olarak ifade etmişlerdir. Ancak son üründe ilk 2 prototipten farklı olarak katılımcılar tartışma forumlarını sürekli kullandıklarını ve başkalarının paylaşımlarından yeni şeyler öğrendiklerini dolayısıyla daha az kaygı duyduklarını belirtmişlerdir. Son uygulamada yer alan tartışma forumları, etkileşimi teşvik eden teknikler kullanılarak

daha etkili olarak kullanılmaya teşvik edilmiştir (Andresen, 2009).

Katılımcıları ders planı aktivitesinde desteklemek için araştırmacı, nihai ürünün uygulanmasına geçmeden önce programda iki farklı iyileştirme yaptı. Öncelikle örnek ders planları çeşitlendirilmiş ve programa farklı dil becerilerine dayalı daha fazla ders planı eklenmiştir. İkinci olarak, programın üçüncü haftasında, katılımcılar ders planı etkinliğine başlamadan önce, aktiviteyle ilgili sorularını yanıtlamak için katılımcılarla senkronize canlı oturum yapılmıştır. Bu tedbirlere bağlı olarak son uygulamada ders planı aktivitesinin içeriğinden duyulan memnuniyette artıl gözlemlenmiştir.

Kullanılabilirlik

Kullanılabilirlik açısından her uygulamada katılımcıların algıları olumlu yönde değişmiştir. Kullanılabilirlik açısından, katılımcıların tüm döngülerde belirttiği tek sorun, mobil cihazların küçük ekranı nedeniyle yaşanan zorluk oldu. Çalışmaya katılanlar, sürükle bırak etkinliklerinin zor olduğunu, makale okumanın hoş olmadığını ve cep telefonlarının küçük ekranlarında ders planlarını biçimlendirmenin büyük bir zorluk olduğunu bildirdiler. Bu nedenle, bazı katılımcılar bu sorunu en aza indirmek için dizüstü bilgisayarlara geçtiklerini ifade etmişlerdir.

Algılanan Etkililik

İkinci prototipteki katılımcılar, prototip 1 ve son uygulamadaki katılımcılara göre gelecekteki mobil öğretmen mesleki gelişim derslerine katılmaya daha istekli olmuşlardır. Tüm döngülerde katılımcılar, mobil öğretmen mesleki gelişim programlarını yüz yüze mesleki gelişim programlarına tercih etme konusunda kararsız kalmışlardır. Ancak tüm döngülerdeki katılımcılar mobil öğretmen mesleki gelişim programlarını yüz yüze öğretmen mesleki gelişim programlarına tercih etme konusunda kararsız olmalarına rağmen, bu mobil öğretmen mesleki gelişim dersinden yüz yüze alacakları ders kadar bilgi öğrendiklerini ve mobil öğrenmenin öğretmen mesleki gelişim programları için uygun bir yaklaşım olduğunu belirtmişlerdir.

Tüm döngülerde, katılımcılar mobil olduklarında cep telefonlarında video açıp

izleyebilmenin veya tartışma forumunda bir gönderiyi okuyup yanıtlayabilmenin, nerede olduklarına veya ne yaptıklarına bakılmaksızın esneklik ve kullanılabilirlik sağladığını belirtmişlerdir. Covid-19, insanların yaşamlarına benzeri görülmemiş zorluklar getirdi. Öğretmenler, özel ve mesleki yaşamlarında beklenmedik koşullara uyum sağlamak zorunda kalmışlardır. Bu koşullar altında, mesleki gelişimi herhangi bir yer ve zamanla sınırlı olmayan günlük aktivitelerine dahil etmekten memnuniyet duyduklarını ifade etmişlerdir.

Tüm döngülerdeki katılımcıların bu dersin faydaları konusunda hemfikir oldukları bir diğer konu da öğretmen özerkliğidir. Bu mobil öğretmen mesleki gelişim dersinde, katılımcılar durumlarına göre kararlar alarak kendi öğrenmelerini kontrol edebilmişlerdir ve mobil öğretmen mesleki gelişim dersi onlara mesleki becerilerini geliştirme fırsatı vermiştir, bu da nihayetinde öğretmen özerkliğine yol açmıştır. Tüm döngülerdeki katılımcılar, bu mobil öğretmen mesleki gelişim dersini aldıktan sonra dijital oyunları gerçek öğrenme kaynakları olarak kullanma potansiyelini fark ettiklerini belirttiler.

Katılımcılar, bu mobil öğretmen mesleki gelişim dersi sayesinde dijital oyunları sınıflarında kullanarak daha verimli bir öğrenme deneyimi yaşatabileceklerini ve öğrencilerin motivasyonlarını artırabileceklerini belirtmişlerdir. Tüm döngülerdeki katılımcıların kazandıklarını düşündükleri bir diğer fayda da teorik bilgileri pratikte uygulama fırsatıydı. Katılımcılar derste öğrendikleri teorik bilgileri gerçek yaşam durumlarına aktarabileceklerini ve sonunda sınıfta kullanabilecekleri bir materyal geliştirebileceklerini belirtmişlerdir.

Son uygulamada görüşülen tüm kişiler, tartışma forumları aracılığıyla diğer öğrenenlerle etkileşime girdiklerini belirtmişlerdir. Tartışma forumlarında diğer öğrenenlerle etkileşime giren katılımcılar, önceleri ilerlemelerinden endişe duyduklarını, ancak diğer öğrenenlerin yorumlarını okuduklarında fazla endişelenmelerine gerek olmadığını anladıklarını ifade etmişlerdir. Ayrıca paylaşılan diğer mesajları okuduklarında konulara hiç düşünmedikleri açılardan bakabildiklerini belirtmişlerdir. Bu sonuç, Dewey (1910) tarafından önerilen "yansıtıcı uygulama"

modeliyle paralellik göstermektedir. Bu modele göre, öğretmenler için bu tür yansımalar önemlidir, çünkü öğretmenler öz-farkındalıklarını geliştirirken aynı zamanda diğerlerinin aynı kavramla ilgili algıları, tutumları ve yansımaları hakkında bir farkındalık geliştirirler ve bu da nihayetinde gelişime yol açar.

Araştırma Sorusu 2

Öğretmenlerin yeni bir teknolojiye alışmalarını sağlamak için, değişimin ve gelişimin nasıl teşvik edileceğini keşfetmeden önce, öğretmenlerin bu yeni teknolojinin mevcut pedagojik yaklaşımlarına ne kadar iyi uyduğuna dair ilk algılarını anlamak önemlidir (Royle, 2014).). Prototip 2 ve son uygulamaya katılanlar öğretmenler, mobil öğretmen mesleki gelişim dersinden sonra dijital oyunların sınıfta sunduğu öğrenme fırsatlarına ilişkin algılarını olumlu yönde değiştirmiştir.

Öğretmenler, dijital oyunların sınıf içi öğrenime nasıl dahil edileceği konusunda doğru bir şekilde bilgilendirildiğinde öğretimlerinde dijital oyunların kullanımına ilişkin olumsuz algılarını değiştirir (McNeil, 2018). Son uygulamaya katılanlar, mobil öğretmen mesleki gelişim dersini aldıktan sonra sınıflarında dijital oyunları kullanmak için daha fazla beceriye sahip olduklarını ifade etmişlerdir. Mobil öğretmen mesleki gelişim dersi, katılımcılara öğretim rutinlerinin dışına çıkma ve dijital oyunları sınıflarına entegre etme becerilerini geliştirme fırsatı vermiştir.

Tüm döngülerin uygulama aşamasında, katılımcılar düşüncelerini müfredattan gerçek öğrenme sürecine kaydırmanın zorluğuyla ilgili endişelerini dile getirmişlerdir. Ayrıca oyunları müfredatlarına nasıl dahil edeceklerini gösteren daha fazla araştırmaya dayalı bilgi görmek istediklerini de eklemişlerdir. Takeuchi ve Vaala (2014), dijital oyunları müfredata dahil etme zorluğunun, öğretmenlerin hizmet öncesi veya hizmet içi mesleki gelişim programları aracılığıyla öğretimlerinde dijital oyunları nasıl kullanacaklarını öğrenme fırsatı bulamamalarından kaynaklanabileceğini öne sürmüştür.

Başarı testi sonuçları, katılımcıların tüm döngülerde mobil öğretmen mesleki gelişim dersini aldıktan sonra dijital oyunla zenginleştirilmiş yabancı dil öğrenimi hakkındaki bilgilerinin önemli ölçüde arttığını göstermiştir. Bu sonuçlardan mobil öğretmen mesleki gelişim dersinin tüm döngülerde katılımcıların dijital oyunla zenginleştirilmiş yabancı dil öğrenimi hakkındaki içerik bilgilerini olumlu yönde etkilediğini anlayabiliyoruz. Katılımcıların ders planı aktivitesindeki başarıları incelendiğinde, ilk prototipteki katılımcıların dijital oyunla zenginleştirilmiş dil öğrenimini biraz anladığı ve uyguladığı anlaşılmaktadır. Ders planı aktivitesi, katılımcılardan geri bildirim alındıktan sonraki her döngüde yeniden geliştirilmiştir ve puanlar diğer döngülerde yükseldi. Nihai ürün uygulamasında, katılımcılardan hiçbiri 1 puan almadı ve tüm katılımcılar ders planlarında konuyu tam veya önemli ölçüde anladıklarını ve uyguladıklarını gösterebilmişlerdir. Başarı testi ve ders planlarının sonuçları birlikte yorumlandığında, mTPD dersinin dil öğretmenlerinin dijital oyunları dil öğreniminde kullanma konusundaki teorik bilgilerini artırmalarına ve dijital oyunları sınıflarına nasıl dahil edecekleri konusunda yeni düşünme yolları geliştirmelerine yardımcı olduğu söylenebilir.

Sonuç

Bu çalışmanın bulguları, dil öğretmenlerinin sınıf ortamlarında dijital oyunları kullanmaya istekli olduklarını ve dijital oyunla zenginleştirilmiş dil öğreniminde pedagojik becerilerini geliştirmek için etkili öğretmen mesleki gelişim programlarıyla desteklenmeleri gerektiğini kanıtlamıştır. Bu çalışma aynı zamanda dil öğretmenlerinin sınıflarda kullanılabilecek dijital oyunlara yönelik olumlu algılarını da ortaya çıkarmıştır, ancak dijital oyunların okul müfredatına dahil edilmesi ile ilgili bazı endişeleri vardır. Karar alıcılar bu konuyu dikkate almalı ve dijital oyunları okul müfredatına entegre etmek için müfredat çalışmaları uygulamalıdır.

Bu çalışma, öğretmenlerin mesleki gelişimlerinin mobil öğrenme ile desteklenen öğretmen mesleki gelişim programlarıyla desteklenebileceğini göstermiştir. Karar

vericiler öğretmenlere mobil öğretmen mesleki gelişim eğitimleri sunmalıdır; böylece birebir öğretmen mesleki gelişim eğitimlerinin maliyeti düşürülebilir, daha fazla öğretmen bu eğitimlere ulaşabilir ve bu eğitimlere istedikleri yerden ve istedikleri zaman ulaşabilirler.

Öğrencilerin mobil öğretmen mesleki gelişim programına yönelik olumlu tutumlarını şekillendiren bu dersin tasarımına ait bazı özellikler vardır. Benzer tasarım ve geliştirme çalışmaları ile ilgilenen diğer araştırmacılar, mobil öğretmen mesleki gelişim programlarını tasarlarken ve geliştirirken bu mobil öğretmen mesleki gelişim dersi tasarımında ortaya konulan çözümler yollarını dikkate alabilirler.

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<u>TEZİN ADI</u> / TITLE OF THE THESIS (**İngilizce** / English): A Mobile Teacher Professional Development Course on Digital Game-Enhanced Language Learning

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