REPUBLIC OF TURKEY
SULEYMAN DEMIREL UNIVERSITY
GRADUATE SCHOOL OF EDUCATIONAL SCIENCES
DEPARTMENT OF FOREIGN LANGUAGES EDUCATION

NEEDS ANALYSIS FOR DIGITAL GAME ELEMENTS CONCERNING DIGITAL GAME-BASED LANGUAGE LEARNING IN PREPARATORY EDUCATION

İdil SAYIN

Advisor: Assoc. Prof. Dr. Nazlı BAYKAL

MASTER'S THESIS
ISPARTA, 2021

CERTIFICATE OF COMMITTEE APPROVAL

We certify that this thesis under the title of **"Needs Analysis for Digital Game Elements Concerning Digital Game-Based Language Teaching in Preparatory Education"** prepared by **"İdil SAYIN"** is satisfactory for the award of the degree of **MASTER OF ARTS** in the Department of **Foreign Languages Education**.

Advisor

Committee Member

Committee Member

Director of the Institute .....

COMMITMENT

I declare that this thesis has been written by taking ethical rules into consideration and by giving all the references cited from the field by referring them in the thesis.

İdil SAYIN

TABLE OF CONTENTS

ABSTRACT

NEEDS ANALYSIS FOR DIGITAL GAME ELEMENTS CONCERNING DIGITAL GAME-BASED LANGUAGE LEARNING IN PREPARATORY EDUCATION

İdil SAYIN

Master's Thesis, Süleyman Demirel University, Graduate School of Educational Sciences, Department of Foreign Languages Education
Advisor: Assoc. Prof. Dr. Nazlı BAYKAL
2021, 96 pages

Playing games is a universal activity in which all humans engage. This activity has evolved into playing digital games as a consequence of the development of technology. Digital games, played by a considerable portion of the world's population, are not used for entertainment purposes only. There are also several digital games developed and used for educational purposes. Furthermore, the educational potential of digital games has been investigated for many years and studies show that they promise fruitful outcomes. By its very nature, English language education is one of the fields of education that can benefit most from the opportunities offered by digital games, and the practice of using digital games in language education is called digital game-based language learning (DGBLL). However, in order to get the optimum benefit from this technology in education, it is important to pay attention to the preferences and needs of the target audience in the game design. Although there are several studies analyzing digital games, most studies in the English language education field have only focused on the effects of DGBLL and not the design of the digital games used in DGBLL. Therefore, this descriptive cross-sectional survey study set out to determine the digital game design element needs and preferences of preparatory education students and lecturers. Two online questionnaires provided quantitative data from 333 participants. The data analyzed with descriptive statistics and visualized with weighted network graphs show that students and lecturers have consensus on preferences and needs in

most of the digital game design elements. The findings found and presented in this thesis add to the understanding of digital game design element needs and preferences of preparatory education students and lecturers for DGBLL. Additionally, the findings provide practical and research contributions to the field of education and game design.

Keywords: English language learning, digital game-based language learning, digital game design, preparatory education, needs analysis

ÖZET

HAZIRLIK EĞİTİMİNDE DİJİTAL OYUN TABANLI DİL ÖĞRETİMİ İÇİN DİJİTAL OYUN ELEMENTLERİNE YÖNELİK İHTİYAÇ ANALİZİ

İdil SAYIN

Yüksek Lisans Tezi, Süleyman Demirel Üniversitesi, Eğitim Bilimleri Enstitüsü, Yabancı Diller Eğitimi Anabilim Dalı

Danışman: Doç. Dr. Nazlı BAYKAL

2021, 96 sayfa

Oyun oynamak, tüm insanların dahil olduğu evrensel bir aktivitedir. Bu aktivite, teknolojinin gelişmesinin bir sonucu olarak dijital oyun oynamaya dönüşmüştür. Dünya nüfusunun önemli bir kesiminin oynadığı bu oyunlar sadece eğlence amaçlı kullanılmamaktadır. Eğitim amaçlı geliştirilmiş ve eğitimde kullanılan birçok dijital oyun bulunmaktadır. Ayrıca, dijital oyunların eğitimdeki potansiyelleri uzun yıllardır araştırılmakta ve yapılan araştırmalar bu oyunların verimli sonuçlar vaat ettiklerini göstermektedir. İngiliz dili eğitimi, doğası gereği dijital oyunların sunduğu imkanlardan en çok yararlanabilecek eğitim alanlarından biridir ve dil eğitiminde dijital oyunların kullanılmasına dijital oyun tabanlı dil öğrenimi (DOTDÖ) denir. Ancak, eğitimde bu teknolojiden en iyi faydayı sağlayabilmek için oyun tasarımında hedef kitlenin tercihlerine ve ihtiyaçlarına dikkat etmek önemlidir. Dijital oyunları analiz eden birçok çalışma olmasına rağmen, İngiliz dili eğitimi alanındaki çoğu çalışma, DOTDÖ'de kullanılan dijital oyunların tasarımına değil, yalnızca DOTDÖ'nün etkilerine odaklanmıştır. Bu nedenle, bu tanımlayıcı kesitsel anket çalışması, hazırlık eğitimi öğrencilerinin ve öğretim görevlilerinin dijital oyun tasarım element ihtiyaç ve tercihlerini belirlemeyi amaçlamaktadır. İki çevrimiçi anket yardımıyla 333 katılımcıdan nicel veri toplanmıştır. Tanımlayıcı istatistiklerle analiz edilen ve ağırlıklı ağ grafikleri ile görselleştirilen veriler, öğrencilerin ve öğretim görevlilerinin dijital oyun tasarım elementlerinin çoğunda tercihleri ve ihtiyaçları konusunda fikir birliğine sahip olduklarını göstermektedir. Tezde bulunan ve sunulan bulgular, hazırlık eğitimi

öğrencilerinin ve öğretim görevlilerinin DOTDÖ için dijital oyun tasarımı element ihtiyaçlarının ve tercihlerinin anlaşılmasına katkıda bulunmaktadır. Ek olarak, bulgular eğitim ve oyun tasarımı alanlarına uygulamada ve araştırmalarda katkılar sağlayacaktır.

Anahtar Kelimeler: İngiliz dili eğitimi, dijital oyun tabanlı dil öğrenimi, dijital oyun tasarımı, hazırlık eğitimi, ihtiyaç analizi

ACKNOWLEDGEMENTS

Foremost, I would like to express my deep and sincere gratitude to my advisor Assoc. Prof. Dr. Nazlı BAYKAL for all the support and contributions not only in the preparation of my thesis but also in my first experiences in academia. I would like to extend my gratitude to my respected professors, Assoc. Prof. Dr. Kağan BÜYÜKKARCI, Asst. Prof. Dr. Ahmet ÖNAL and Asst. Prof. Dr. Nihan ERDEMİR, for their continuous support and encouragement in all the time of the research and writing of this thesis.

I would like to thank my graduate friends for their not only academic but also emotional support, which I enjoyed and benefited greatly from working together during my graduate education. You were the best peers and friends I could have ever asked for. I would also like to offer my special thanks to my dear friends Ulviye SAVAŞ, Yusuf Mehmet KURALAY and Hande GEZGİN for their patience, understanding encouragement and efforts to rest my mind when I needed it.

I would also like to acknowledge Dr. Gülin ZEYBEK and Asst. Prof. Dr. Atilla ÖZDEMİR for being there for me and for their valuable guidance and insightful feedback that enabled me to choose the right direction and successfully complete my thesis.

I would like to express my gratitude to my dear family, my dear grandparents, my father Abdurrahman Tevfik SAYIN, my mother Ayşe SAYIN, my dear young-looking elder sister İrem SAYIN, my aunt Hülya SAYIN and last but not least to our family cat Çakıl and my study peer cat Kestane for always believing in me, for their support and unconditional love.

For all the people I could not mention here, thank you for your tremendous understanding and encouragement. Without you, it would not be possible for me to complete my thesis.

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

DGBL	Digital Game Based Learning
DGBLL	Digital Game Based Language Learning
FLE	Foreign Language Education
f	Frequency
n	Number
%	Percentage

OPERATIONAL DEFINITIONS

Digital game: Games played interactively on different types of electronic media with one or more players (Tan & Jansz, 2008; Demirbilek, 2009).

Games in learning: Umbrella term covering all kinds of digital games designed for educational purposes.

Digital game-based language learning: Using digital games to learn or teach a language.

1. INTRODUCTION

This chapter aims to briefly introduce the background of the study. For this purpose, the statement of the problem, purpose and significance of the study will be described. Lastly, assumptions and limitations of the study will be presented.

1.1. Statement of the Problem

Ever since the humans existed, besides their basic needs such as food, drink, and shelter, they have utilised various activities to fulfill their needs. One of these activities is playing. Playing, which has been a part of the existence and culture of people throughout history, has also undergone changes with the characteristics of the ages. With the introduction of technology into daily life, the concept of playing has evolved. Digital games can be given as an example of these new concepts. As reported by the latest data, there are 2.69 billion people worldwide playing digital games as of 2020 (Gough, 2020). Considering that the world population is 7.8 billion by December 2020, it is seen that 34.4% of the people in the world play digital games (Worldometers.info, 2020). By 2023, the number of people playing digital games is expected to reach 3.07 billion and the world's human population to reach 8 billion, making it 38.3% people in the world playing digital games (Gough, 2020; Worldometers.info, 2020). When the ages of the players of digital games are examined, Digital Game Market Report (Ankara Kalkınma Ajansı, 2020) states that players between the ages of 16-24 and 25-34 make up a large part of players, and Turkey Game Industry 2019 Report (Gaming in Turkey, 2020) states that the age group 25-34 constitutes a large percentage of it (34,95%). Data suggest that the gaming industry grows over the years and gains places in different areas.

Education is one of the areas digital games are utilized as a tool for different purposes besides entertainment. In education, tools such as edutainment games, educational games, and serious games can be cited as different utilizations of digital games. The use of these games as a part of language education is called digital game-based language learning (Hung et al. 2016). Many studies revealed the positive effects of DGBLL on various language skills (Hung et al. 2018). The fact that these games attract more and more recognition in education and progress to become a promising tool as a part of

digital game-based learning has drawn attention to the designs of these games (Chen et al., 2020). Many studies show that these games are effective tools, especially in language education, thanks to the various opportunities they offer. Nevertheless, the excessive academicization in the designs of digital games used in education can cause the fun part of these games to disappear, thus leading to a bad reputation (Mitgutsch & Alvarado, 2012; Van Eck, 2006). Therefore, game designers stated that the designs of digital games used in education are difficult and that such games should be prepared in accordance with the expectations of the target audience (Flanagan, 2009; Mitgutsch & Alvarado, 2012; Winn, 2009). In addition, theories investigating why and with what criteria people prefer and engage with digital games also suggest that people tend to prefer games that meet their own needs and expectations.

Although various theories and game designers argue that digital games should be designed compatibly to the needs and preferences of the target audience for them to be accepted and used effectively by people (Catalano et al., 2014; Mitgutsch & Alvarado, 2012), it has been observed that there is a scarcity of studies exploring the needs and preferences of the target audience regarding the design of a digital game in language learning. Hence, it is argued that this deficiency should be eliminated to see the expected effect of these games (Bellotti et al. 2011; Kiili, 2007; 2010). Even though various design and evaluation frameworks have been proposed for the design of games in learning, these frameworks are not specific to cover the age and needs of the target audience of this study's scope (Hamari & Eranti, 2011; Mitgutsch & Alvarado, 2012; Winn, 2009).

1.2. Purpose of the Study

This study aims to determine the digital game design element needs and preferences of tertiary level English preparatory education students and lecturers for DGBLL. The participants of this study were determined as the students and lecturers of the education level that is suitable for the age group that plays digital games the most. In order to determine the needs and preferences of the participants, the literature was examined, and 2 questionnaires were developed. Questionnaires were conducted in 5 randomly selected state universities in Turkey. Collected data were analyzed by descriptive

statistics. Data were visualized with weighted network graph. In this light, this study sought to answer the following research questions:

1. What are the digital game design element needs of English preparatory education students for a digital game concerning English language learning?
2. What are the digital game element design needs of English preparatory education lecturers for a digital game concerning English language learning?

1.3. Significance of the Study

This recent study aims to find out the needs and preferences regarding digital game design elements of English preparatory education students and lecturers for DGBLL. Therefore, it examined several digital game design frameworks for educational purposes and various studies related to this topic to create a concept map to develop questionnaires regarding digital game design elements for educational purposes. After the examination of these studies, this thesis adopted Kalmpourtzis (2018)'s educational game design element pentad as the basis of the concept map. By examining many studies for sub-elements, a concept map was created for the questionnaire development.

Additionally, this study attempts to propose a weighted network graph for English preparatory education students' and lecturers' digital game elements needs concerning English language learning. Therefore, it will contribute to many areas as a tool for English preparatory education lecturers to select the digital game that best suits their students' needs, or by providing a data-driven list of needs for educational game developers that aims to develop a digital game for English preparatory education.

Lastly, the concept map presenting the main and sub-elements of games in learning will provide a basis for the development of questionnaires aiming to determine the educational game design element needs of different education levels.

1.4. Assumptions

In the study, it is assumed that participants who returned the questionnaires had an overall idea of the questions and answered them sincerely.

1.5. Limitations

- The study is limited to 5 randomly selected state universities' English preparatory schools in Turkey.
- Applying the questionnaires online due to the pandemic may have caused coverage error (Couper, 2000; Dillman et al., 2014).
- Data is limited to those collected by questionnaires which were developed based on the data available to the researcher.

2. CONCEPTUAL FRAMEWORK AND RELATED STUDIES

In this chapter, the theoretical framework and the phenomenon that form the basis of the study will be explained.

2.1. Psychological and Theoretical Foundations of Digital Game Preferences

Digital games can be defined as games played interactively on different types of electronic media with one or more players (Demirbilek, 2009; Tan & Jansz, 2008). In the literature, this term has different relationships with various terms such as video games and electronic games (Alpert, 2007). In some studies, the term 'digital games' is used interchangeably with the terms (Demirbilek, 2009; Li, 2020), while in other studies, it is considered as an umbrella term that includes these terms (Bösche, & Kattner, 2011; Carras et al., 2019; Tan & Jansz, 2008). In this study, *digital game* will be used synonymously with the terms *video games* and *electronic games*.

The value of the digital game market is increasing rapidly, and it is estimated to reach 200 billion US dollars in 2023 (Statista Research Department, 2021). According to current data, 2.69 billion people worldwide are playing video games as of 2020 (Gough, 2020). The constant rise in the value of this market and the fact that people play and invest time and money in these games addictively have also attracted the attention of the psychologists. There are several theories used in game studies that help explain why people engage with these games, why they are motivated to play and what makes them prefer specific game features. Hamari and Keronen (2017) and Boyle et al. (2012) examined game studies and listed the most frequently mentioned psychological theories in these studies. These theories are as follows;

- Theory of Flow
- Self Determination Theory
- Self-efficacy Theory
- Theory of Planned Behavior
- Uses and Gratification Theory
- Technology Acceptance Model
- The Big Five Personality Traits

Theory of flow: Csikszentmihalyi introduced the theory of flow in 1990 to explain how and in what conditions people engage in an activity. He explained the flow as "the state in which people are so involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will do it even at great cost, for the sheer sake of doing it" (Csikszentmihalyi, 1990, p. 4). The theory argues that people perform a certain activity when 8 conditions that provide an optimal experience and a state of flow for its users are met (Csikszentmihalyi, 1990; Jackson, 2012). These conditions are: (1) challenging activity that requires skills with a chance to be completed; (2) full concentration; (3) clear goals; (4) immediate feedback; (5) deep involvement to the extent that player forgets concerns; (6) sense of control; (7) loss of self-consciousness; (8) the transformation of time (Csíkszentmihályi, 1990).

Self-determination theory: Self-determination theory, developed by Deci and Ryan (2000), hypothesizes that people are involved in various activities to meet their universal needs to function effectively and stay psychologically healthy (Deci & Ryan, 2008). In this theory, the essence of motivation to take an action comes from intrinsic motivation (Frederick & Ryan, 1995). In order to promote intrinsic motivation, an activity should encompass autonomy, competence and relatedness. Autonomy is the control that players have over the game. Competence is the suitability of challenges' difficulty with players' abilities. Relatedness is the feeling of connectedness of players to each other (Şengün, 2018).

Self-efficacy theory: Self-efficacy theory is a concept introduced by Bandura in 1977 as a more extensive theory called the social cognitive theory. Bandura (1977) explains this theory as "the conviction that one can successfully execute the behavior required to produce the outcomes". In other words, self-efficacy theory argues that the adoption of a certain activity or goal is depended on one's personal belief of ability to succeed that certain activity or goal (Bandura, 1977;1990). According to this theory, the perceived efficacy of an individual is more important than the individual's real efficacy (Bong & Clark, 1999).

Theory of planned behavior: The Theory of Planned Behavior, developed by Ajzen (1985), was based on the Theory of Reasoned Action (Fishbein & Ajzen 1975) to understand, predict, and change human behavior (Ajzen, 1991). Ajzen claims that the

intention of an individual can predict the behavior of that individual (1985). According to this theory, intention is a combination of the attitude towards behavior, subjective norms and perceived behavioral control (Haagsma et al., 2012). If a person's attitude towards the game is positive, it is expected for this person to play the game more. Perspectives of people who are important in a person's life affect their gaming habits. Whether the act of gaming can be performed within the scope of a person's skills affects whether this act will be performed or not.

Uses and gratification theory: Uses and gratification theory emerged to understand the audience involvement in media and media content, which treats people as active audience rather than passive ones (Blumler, 1979). According to this theory, people involve in media and media content for gratification purposes such as being socially and psychologically satisfied (Liu, 2015).

Technology Acceptance Model: Technology Acceptance Model (TAM) was developed to better understand the reasons why people adopt or not adopt a technology (Davis, 1989). It examines the acceptance of technology from two main perspectives: ease of use and effectiveness. TAM has varieties developed according to the characteristics of different technologies (Benyon, 2019). According to this model, someone who finds digital games useless and very difficult is less likely to play the game.

The Big Five Personality Traits: This framework was developed by McCrae and Costa (1987) to broadly describe the personality under five personality traits. These five traits can be listed as Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. Studies have shown that personality traits at different levels cause changes in people's game preferences (De Hesselle et al., 2021; Graham & Gosling, 2013).

When the theories briefly explained above are examined, it is evident that people's gaming habits and preferences get affected by their needs and expectations from the game or their attitudes towards the game. In this sense, if the features of a digital game are not suitable for the needs, expectations and interests of the target audience, it is unlikely for this digital game to be preferred by this target audience.

2.2. Digital Games in Education

Digital games have been used as a tool in education for many years to offer instruction, raise awareness or support individual learning (Felicia, 2009). The use of these games for educational purposes is discussed under two different concepts; gamification and digital game-based learning (DGBL). Gamification is the use of game design elements in non-game environments for different purposes such as increasing user engagement, productivity, and learning (Deterding et al. 2011; Faiella & Ricciardi, 2015; Hamari, 2013; 2017; Sailer & Homner, 2020). On the other hand, DGBL is described as the use of digital games in learning by Prensky (2001a; 2001b), who introduced the term DGBL to the field of education. Similarly, other researchers have defined DGBL as the use of digital games within the scope of instruction for learning rather than entertainment (Van Eck, 2015). When the definitions are examined, it is possible to state that gamification and DGBL are different approaches; gamification referring to the use of game design elements to increase motivation and attention in non-game environments and DGBL is learning through a digital game (Schaaf, 2017). Similarly, game-based learning is used synonymously with the term digital game-based learning (DGBL) However, game-based learning includes non-digital games, while digital game-based learning covers the use of digital games in education (Susi et al., 2007). The confusion regarding the use of these terms in research occurs due to having no clear-cut description in the terminology. Some researchers state that gamification is a concept that includes game-based learning (Kapp, 2012) on the other hand, there are researchers who argue that these two concepts should be considered separately (Al-Azawi et al., 2016; Gregory et al., 2015; Landers, 2014).

DGBL is an especially promising educational technology field that has started to attract attention (Chen et al., 2020). In DGBL where learning is supported by digital games, the aim is to integrate digital games into the learning process in a harmonious way. Principles and theories such as assimilation and accommodation (placing new information into existing categories and modifying existing information in case of conflict between new and existing information), situated cognition (learning occurring in meaningful context), play theory (play as a socialization and learning mechanism) support the benefits of using digital games in learning (Van Eck, 2006). Besides this theoretical background, considering that the new generation spends most of their time

gaming, it can be predicted that this practice will yield successful results in education. In line with this, educational studies have found that the use of DGBL provides various benefits to students (Clark et al., 2016; Sitzmann, 2011; Vogel et al., 2006; Wouters et al., 2013). Studies show that the use of digital games in education develops 21st century skills (Romero et al., 2014), increases students' motivation, enables students to focus on the lesson and makes the lesson more enjoyable (Allen et al., 2014; Almeida & Simoes, 2019; Alsawaier, 2018; Bellotti et al., 2013; De Freitas, 2018; Prensky, 2003; Rama et al., 2012; Taub et al., 2020; Vos et al., 2011; Yang et al., 2020).

2.2.1. Digital games in learning

Digital games used in education are divided into two groups (Van Eck, 2006). The first is the commercial off-the-shelf games designed for non-educational purposes, the second is digital games designed for educational purposes. Examples of commercial off-the-shelf games designed for non-educational purposes are World of Warcraft, Ragnarok Online, League of Legends, Counter-Strike: Global Offensive, Guild Wars, The Sims (Cabraja, 2016; Nardi et al., 2007; Rama et al., 2012; Ranalli, 2008).

Digital games designed for educational purposes are defined with different terms such as edutainment, edugames (the amalgamation of educational games), and serious games. There is no consensus in the explanation of these terms and these terms are often used interchangeably (Landers, 2014; Ratan & Ritterfeld, 2009). However, some researchers in the field state that these terms have different meanings and purposes. According to Charsky (2010), edutainment games refer to the games aiming lower order thinking skills, while serious games refer to the games aiming higher order thinking skills. On the other hand, Beatman and Duff (2019) argue that terms differ according to the context, for example the term 'serious game' is usually preferred in K-20 education (formal education). Additionally, according to some researchers, serious game is an umbrella term, and games designed to balance learning and fun are called serious games, serious representing the learning goal, game representing the fun aspect (Arnab et al., 2014; Lameras et al., 2016). In this study, the term 'games in learning' was chosen as an umbrella term as it was suggested by Beatman and Duff (2019). As games in learning can be developed and used for certain subjects, they also can be used to raise awareness in various subjects. Examples of games in learning developed to raise

awareness are given in Figure 1. In the figure, the first picture is from the game called *Ban Human Trafficking* developed by Balkans ACT (Against Crime of Trafficking) Now! Project to familiarize people with risky situations related to human trafficking and the process of escaping the human trafficking chain. The second picture is from *Darfur is Dying* which was developed to raise awareness about the living conditions of the 2.5 million refugees living in Sudan. The third picture belongs to the game *Enercities* developed to offer its players the experience of developing eco friendly cities while trying to balance the sources. The fourth picture is from the game called *Ayiti: The Cost of Life* developed to raise awareness of the life standards of living in the rural area of Haiti.

Figure 1. Examples of games in learning developed for raising awareness

Examples of games in learning designed for certain subjects are given in Figure 2. The first picture is from the game *Mathbreakers* developed to teach elementary level mathematics. The second picture is from the game *Spongelab Biology* aiming to teach the history of biology. The third picture is from the called *Sprite's Quest* that teaches 7th and 8th grade geography. The fourth picture is from the *Practice Spanish: Study Abroad* game developed to teach Spanish by offering its players the experience of studying abroad by presenting real-world challenges.

Figure 2. Games in learning for certain subjects (Alhadeff, 2010; 2013; 2014; 2016)

2.3. Digital Game-Based Language Learning

Digital games, which have started to attract attention and started to be frequently utilized in every field of education, provide promising results especially in foreign language education (FLE). In this sense, digital game-based language learning (DGBLL) is defined as "the design and use of a diverse array of digital games for the purpose of learning or teaching a second or foreign language" (Cornillie et al., 2012, p. 243). This popularity of DGBLL is due to the reason that digital games provide advantages such as replications of sociocultural situations (Anderson et al., 2008; Ryu, 2013; Schwienhorst, 2002), exposure to language learning environment, feedback, motivation (Peterson, 2013), safe place for practicing (Godwin-Jones, 2014; Hitosugi et al., 2014; Ryu, 2013), meaning focused practices (Peterson, 2013), removing affective barriers of language learning (Reinders & Wattana, 2012), contextualized learning (Reinders, 2017), tangential learning (Savonitti & Mattar, 2018) and opportunities to use target language for interaction (Peterson, 2013). It is known that language education benefits from many off-the-shelf games. Examples of these games are World of Warcraft, Ragnarok Online, League of Legends, Counter-Strike: Global Offensive, Guild Wars, The Sims (Cabraja, 2016; Nardi et al., 2007; Rama et al., 2012; Ranalli, 2008). Various studies show that DGBLL has a positive effect on language education.

According to studies, DGBLL improves vocabulary learning (Ansteeg, 2015; Berns et al., 2013; Bytheway, 2014; Ceylaner & Yelken, 2017; Ebrahimzadeh, 2017; Jensen, 2017; Yudintseva, 2015), writing skills (Allen et al., 2014; Lin et al., 2018; Suh et al., 2010), reading skills (Suh et al., 2010), listening skills (Berns et al., 2013), speaking skills (Hwang et al., 2017; Peterson, 2012) and motivation (Berns et al., 2013; Wu & Huang, 2017).

2.4. Game Design for Educational Purposes

Each digital game is meticulously designed and presented to the market in accordance with the design purpose and target audience. During the design process, it is important to know and respond to the expectations and needs of the game's target audience. In order for the games developed for educational purposes to achieve the expected effect, the characteristics of the target audience should be considered. Educational games have a bad reputation in terms of design due to prioritizing educational purposes before the needs and expectations of the target audience resulting with funny and meaningless contents in game designs (Mitgutsch & Alvarado, 2012). Therefore, in the design process of educational games, the target audience should be included in these processes and these should be carried out more carefully in a holistic sense. Considering that the main sector of digital games is the entertainment sector, studies on designs of games in learning are limited. Additionally, in the literature, data-driven educational game design studies are few in number.

According to Flanagan (2009) educational game design is the most challenging game design due to the obligation that they have to be both engaging and effective. Therefore, success of these games depends on establishing a good balance between entertainment and learning (Brisson et al., 2012).

2.4.1. Game design frameworks for educational purposes

Games in learning, which are different from the entertainment games, comprise the educational dimension, should be developed in a way that will attract the attention of the students and convey the educational content properly. In this respect, various design frameworks have been developed in the literature to overcome the challenging designs

of games in learning. Majority of the game design frameworks for educational purposes are based on the game design framework Mechanics, Dynamics and Aesthetics (MDA) framework developed by Hunicke et al. (2004). Mechanics is the basic elements of games such as rules, goals, actions and controls. Dynamics is the result of player integration with game through game mechanics. Aesthetics is audio-visual elements of a game that arouse emotional responses from players.

Winn (2009) developed the Design, Play and Experience (DPE) framework for games in learning based on MDA framework. In this framework, he added four layers to the three main layers of MDA. These four layers are learning, storytelling, gameplay and user experience. The structure of DPE is presented in Figure 3. According to the DPE framework, designer only has direct control over the design and not the experience of the player. As it is presented in the Figure 3, experience influences the design, and it is bounded not only to the design itself but also to the player's background characteristics (Winn, 2009). Therefore, Winn (2009) emphasizes the importance of considering the target audience throughout the game design process.

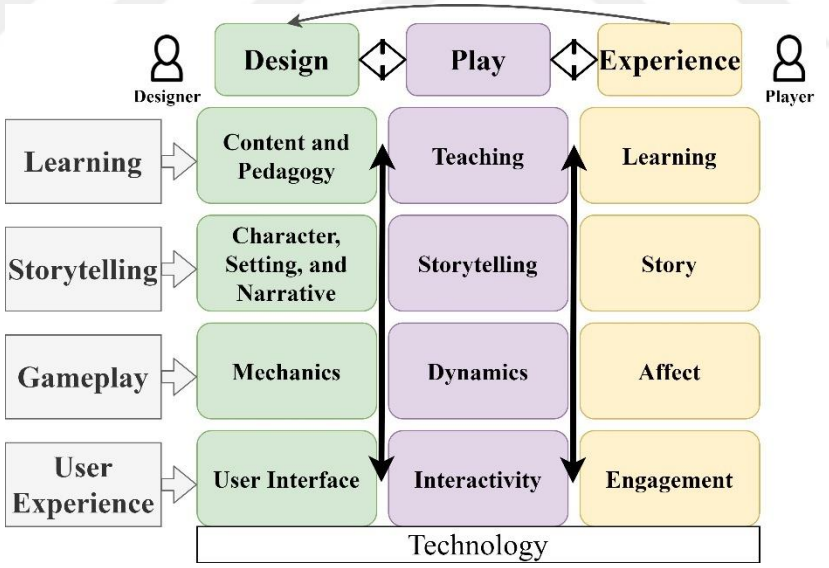

Figure 3. The structure of DPE (redrawn from Winn, 2009, p. 1015)

Aleven et al. (2010) proposed a framework consisting of three components for the analysis and design of educational games. The first component is learning objectives which covers the answers for three questions related to prior knowledge players need to possess to play the game, knowledge and skills expected to be learned by players

through the game and potential knowledge learnt through the game that can be transferred to higher order thinking skills. The second component is the MDA framework (Hunicke et al., 2004). The third component is instructional principles which argue that the design of the game should be based on research-based principles.

Mitgutsch and Alvarado (2012) developed Serious Game Design Assessment (SGDA) framework to assess and plan the design of serious games. According to the framework, serious games are based on six elements as shown in Figure 4. Mitgutsch and Alvarado (2012) described those six elements as follows: Purpose is the scope and aim of the game and designers' purposes; Content and information is the data offered to players in the game; Mechanic is broadly rules and actions enabling player to interact with the game; Fiction/Narrative is the scenario and characters; Aesthetics/graphics is the visualization of the game; Framing is concerned with players and their ability to play the designed game.

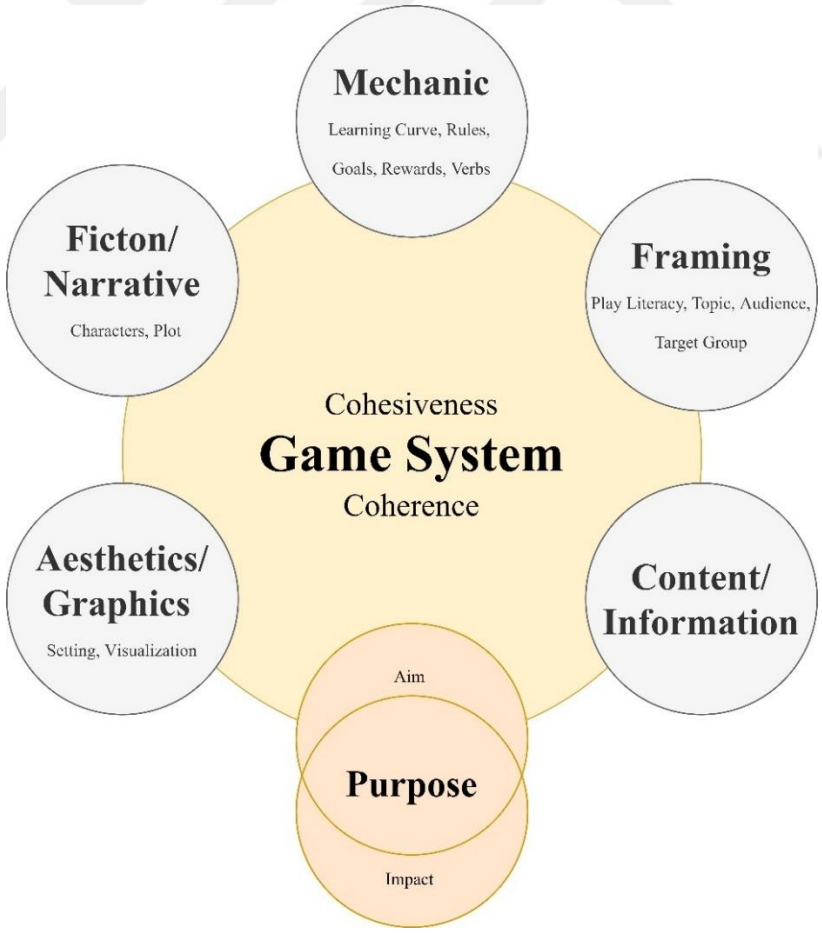

Figure 4. Elements of SGDA (redrawn from Mitgutsch & Alvarado, 2012, p. 123)

Arnab et al. (2014) proposed the Learning Mechanics–Game Mechanics (LM-GM) model by combining the game mechanics and pedagogical elements in the literature. This model was proposed to help the analysis and design of serious games by enabling the identification of pedagogical and entertainment elements and their interrelationships. Figure 5 shows the map of the LM-GM model.

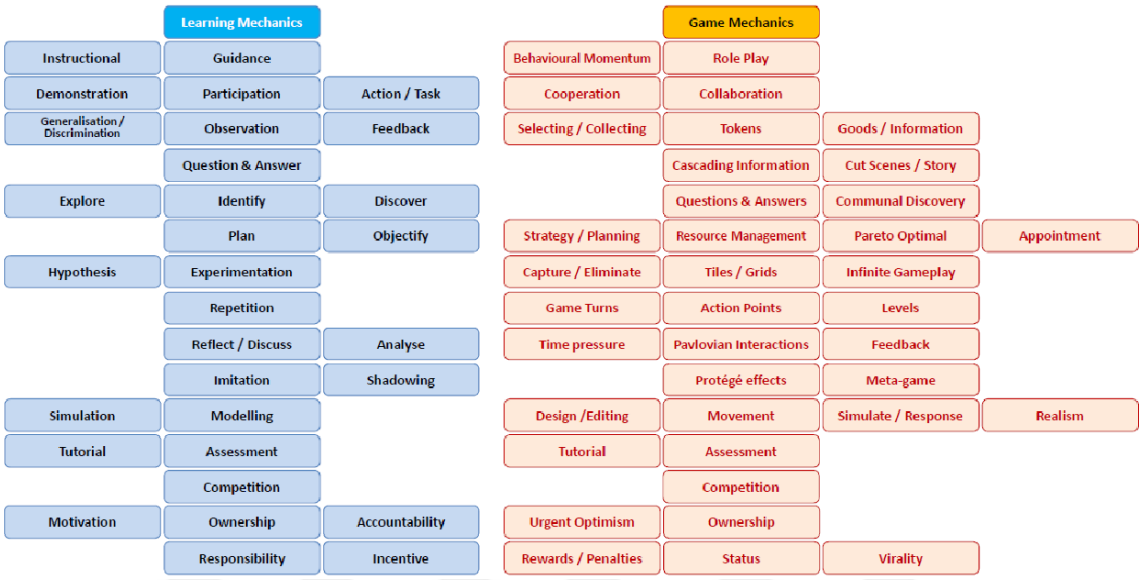

Figure 5. Map of the LM-GM Model (Arnab et al., 2014, p. 7)

Another framework developed for educational game design is the Game Object Model (GMO) by Amory et al. (1999) and Amory (2001). According to this model, educational games should consist of objects in relation to abstract and concrete interfaces. Abstract interface comprises of theoretical and pedagogical background. On the other hand, concrete interfaces refer the design elements of the game. GOM is presented in Figure 6. As it is shown, there are five types of objects in the GOM. Those types are Game Space, Visualization Space, Elements Space, Actors Space and Problem Space. Game Space includes all other space objects as well as its own objects. Visualization Space also includes its objects and the objects of Elements, Actors and Problem spaces. Elements Space includes its own objects and Actors Space objects. In the figure, white circles represent the concrete interfaces while black circles represent abstract interfaces.

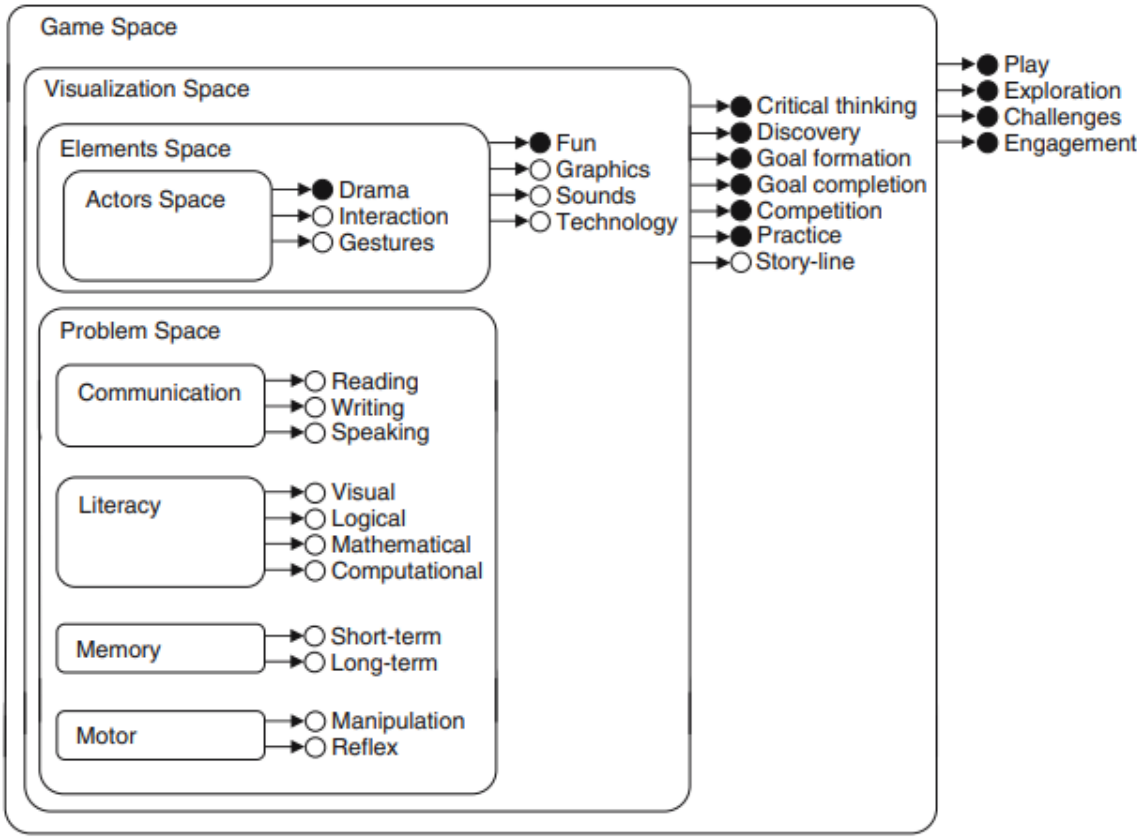

Figure 6. The game object model (GOM) (Amory, 2006, p. 53)

In 2006, Amory updated the GOM to be more inclusive by adding theoretical concepts into the model and created GOM II. GOM II is a richer model including contemporary learning practices to evaluate or plan educational game design. Illustration of GOM II is presented in Figure 7.

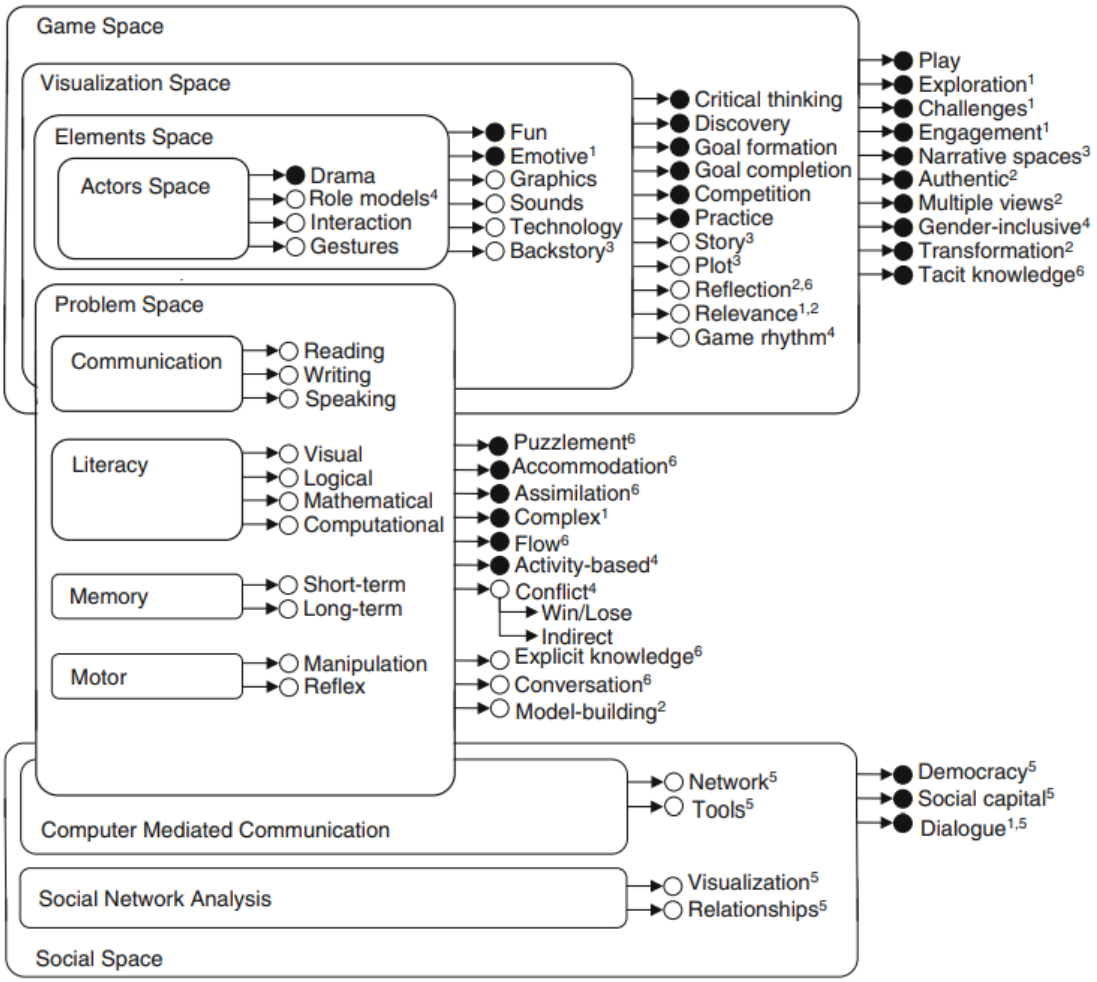

Figure 7. The game object model II (GOM II) (Amory, 2006, p. 55)

In 2018, Kalmpourtzis developed an educational game design element pentad based on the game designer Schell (2014)'s game design element tetrad. Schell's game design element tetrad is presented in Figue 8. Kalmpourtzis's educational game design element pentad is shown in Figure 9.

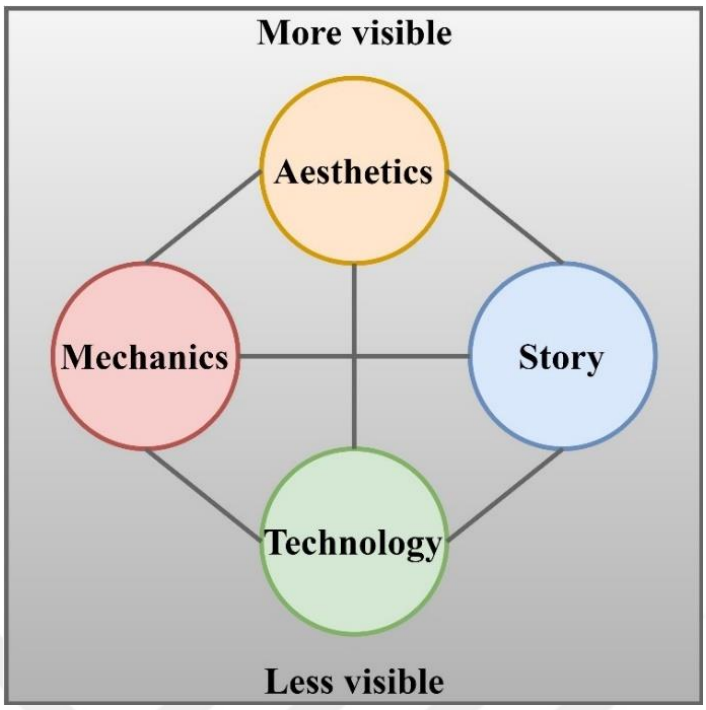

Figure 8. Game design element tetrad (Schell, 2014, p. 54)

Figure 8 shows the four main elements namely aesthetics, story, mechanics and technology identified by Schell to design a game (Schell, 2014). Mechanics consists of procedures and rules that determine the game's feedback to player's actions. Story is the game's event sequence which can be branching or pre-determined. Aesthetics is the most visible element of the game design by consisting of sensuous elements. Lastly, the least visible element technology makes the game possible. Schell (2014) notes that the design of the tetrad does not show the importance of the elements since none of the elements are more important than the other ones. Tetrad was designed to show the visibility and connections of the elements.

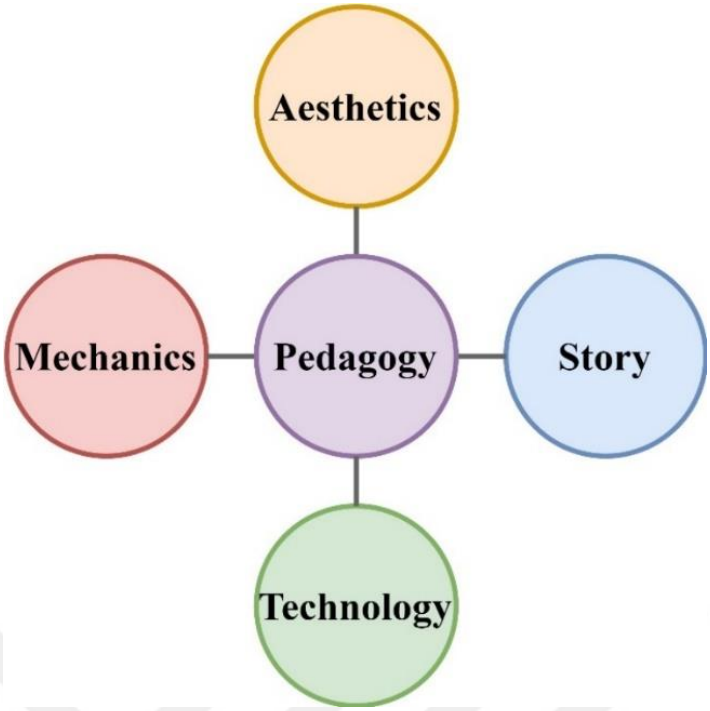

Figure 9. Educational game design element pentad (Kalmpourtzis, 2018, p. 143)

Figure 9 displays the educational game design element pentad designed by Kalmpourtzis (2018). In this pentad, while maintaining the four main game design elements that Schell identified (2014), Kalmpourtzis adds the fifth main element, pedagogy, which is essential for educational game design. While all elements impact each other, pedagogy is placed in the middle to represent its direct impact in the development of all other design elements. Kalmpourtzis (2018) argues that the strength of this impact is dependent on the objectives of the designer.

For this study, the designs prepared for games in learning listed above were examined. However, the researcher could not find a sufficiently detailed design that matches the purpose and the characteristics of the target audience of this study. For this reason, Educational Game Design Element Pentad of Kalmpourtsiz (2018) has been selected as the basis for questionnaire development. Other designs and various studies were used to determine the sub-elements to be covered in the questionnaires (Ahmad, 2019; Ahmat et al., 2015; Arnab et al., 2014; De Lope et al., 2017; Lameras, 2015; Lameras et al., 2016; Roungas, 2015; Sillaots, 2015; Sillaots et al., 2016) (see Figure 12).

3. METHODOLOGY

This survey research is a descriptive quantitative study. Survey research is defined as collecting information from participants through questions (Check & Schutt, 2012). Therefore, this study aims to determine the digital game element needs of English as Foreign Language lecturers and students for a digital game that will be used for DGBLL in preparatory education. In this chapter, the methodology of the study will be explained in detail by presenting the research design, participants, data collection tools, data collection and analysis processes.

3.1. Research Design

This survey research adopts descriptive cross-sectional survey design which can be defined as collecting data from a specific population at a single point in time through surveys (Lavrakas, 2008; Visser et al., 2000). Figure 10 presents the workflow diagram of the research. The research process started with questionnaire development. After developing the questionnaires, researcher sent them to the Ethics Committee of Süleyman Demirel University to receive ethical approval (see Appendix H). Later, application approval was sought from randomly selected universities in Turkey. Questionnaires were conducted on an online platform (Google Forms) in the universities that gave application approval (see Appendix C, Appendix D, Appendix E, Appendix F, Appendix G). After the application process, data were analyzed by descriptive statistics. Finally, the researcher interpreted the results, created a graph to visualize the findings and reported it. Weighted network graph was prefered to visualize the data to present the relationships of the elements which were emerged from the data analysis.

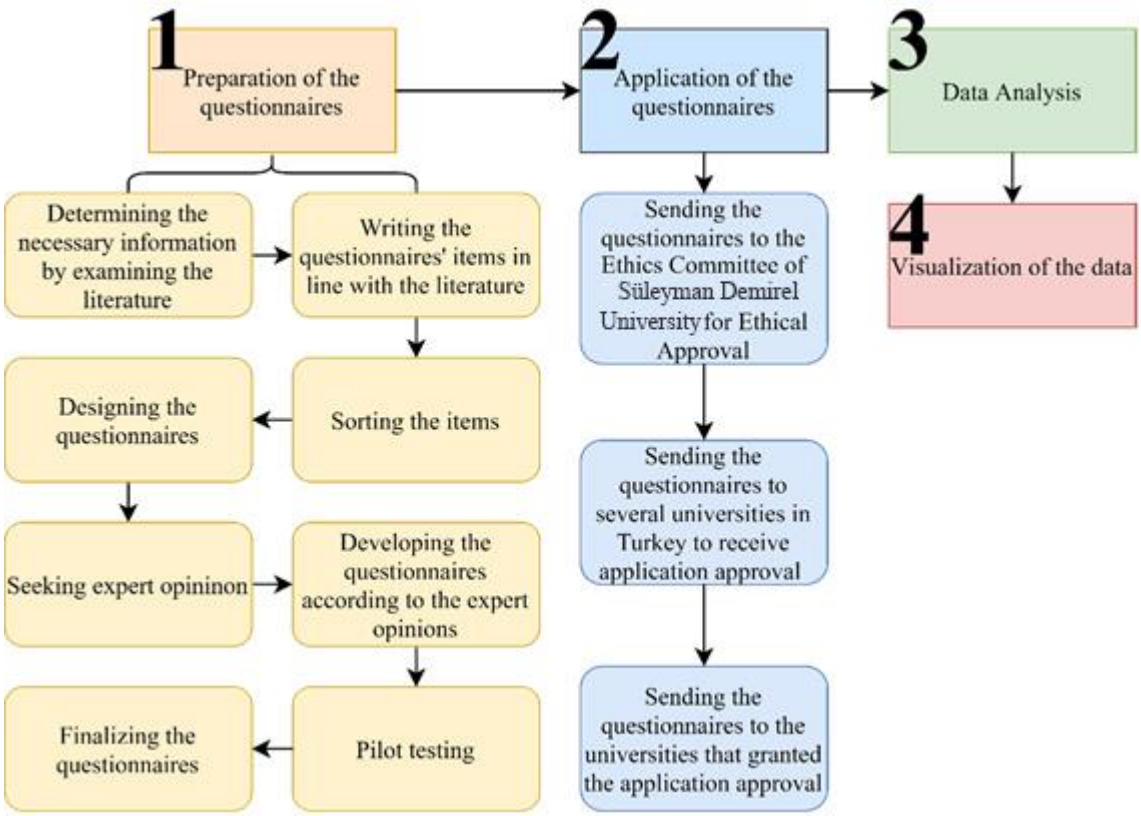

Figure 10.Workflow diagram of the research

3.2. Participants

In survey research, it is crucial to identify the key characteristics of the participants that are aimed to be included in the study (Ponto, 2015). Therefore, in order to determine the target audience and participants of the study, the literature was reviewed and it was found that players between the ages of 16-24 and 25-34 constitute a large part of the total players according to Digital Game Market Report (2020) and players between the ages of 25-34 constitute 34.95% of the total players according to Turkey Game Industry 2019 Report (Gaming in Turkey, 2020). Since university education is the proper education level for this age range of students, English preparatory education students were determined as the participants of the study. Therefore, this thesis aimed to analyze tertiary level English preparatory education students' and lecturers' needs and preferences regarding digital game design elements and to prepare graphs regarding the subject. Participants (students and lecturers) were selected using purposive sampling to avoid bounded reality problems which can be defined as participants having a lack of experience or knowledge about the subject they are asked about (Simon, 1957). In the pilot study of questionnaires, 15 students and 15 lecturers of a state university's English

preparatory school who did not participate in the actual study took part in. As for the actual study, a total of 333 participants studying or teaching in randomly selected 5 universities located in different regions of Turkey completed the questionnaire. Table 1 presents the number of participants according to the universities. Table 2 provides the distribution of the participants by groups, age and gender.

Table 1. Number of participants according to the universities

	Groups				Total	
	Students		Lecturers			
Universities	*n*	*%*	*n*	*%*	*n*	*%*
Süleyman Demirel University	83	31.3	20	29,41	103	30.93
Mardin Artuklu University	48	18.11	11	16.17	59	17.71
Ankara Hacı Bayram Veli University	51	19.24	12	17.64	63	18.91
Fırat University	40	15.09	15	22.05	55	16.51
Muğla Sıtkı Koçman University	43	16.22	10	14.7	53	15.9
Total	265	100	68	100	333	100

Table 2. Distribution of the participants by groups, age and gender

	Groups				Total	
	Students		Lecturers			
Age & Gender	*n*	*%*	*n*	*%*	*n*	*%*
Gender						
Female	151	56.98	31	45.58	182	54.65
Male	114	43.01	37	54.41	151	45.34
Age						
Younger than 20	149	56.22	0	0	149	44.74
20-24	76	28.67	5	7.35	81	24.32
25-29	28	10.56	9	13.23	37	11.11
30-34	12	4.52	15	22.05	27	8.1
35-39	0	0	21	30.88	21	6.3
40-44	0	0	12	17.64	12	3.6
45-49	0	0	6	8.82	6	1.8
Total	265	100	68	100	333	100

3.3. Data Collection Tools

Questionnaires are data collection tools used to collect participants' ideas on a topic (Erkuş, 2007; 2010). Therefore, the researcher selected questionnaires as the data collection tools suitable for the research questions posed in this study. In this study, two questionnaires prepared separately for both participant groups were used as data collection tools. The questionnaires were developed by the researcher. Work-flow chart of questionnaire development process is presented in Figure 11.

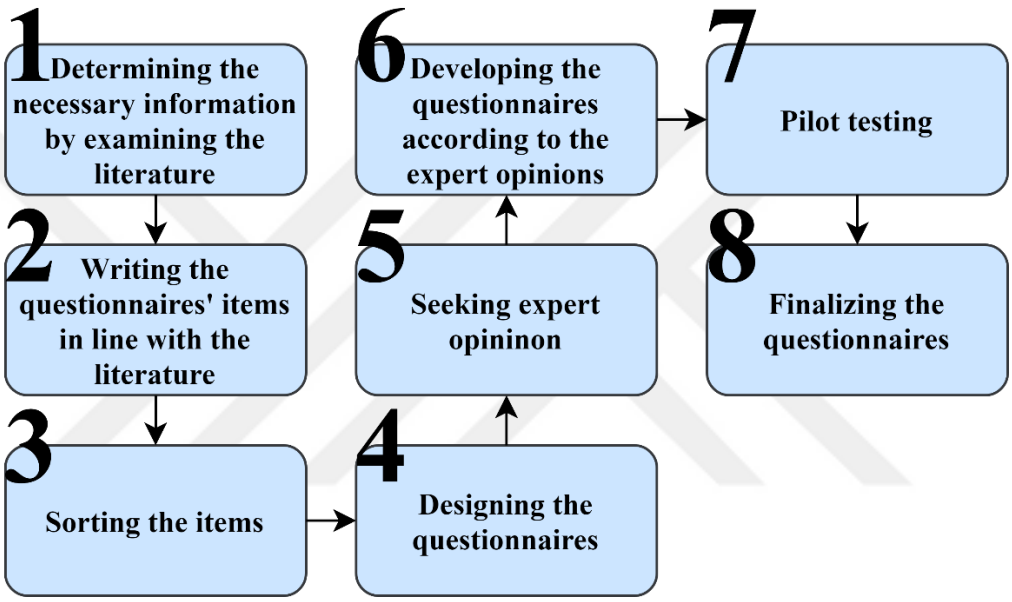

Figure 11.Work-flow chart of questionnaire development process

The questionnaire development process started with determining the information that constitutes the content of the question. In order to collect the necessary information to create the questionnaire, various studies that have worked on game design elements for educational purposes (Ahmad, 2019; Ahmat et al., 2015; Arnab et al., 2014; De Lope et al., 2017; Kalmpourtzis, 2018; Lameras, 2015; Lameras et al., 2016; Roungas, 2015; Sillaots, 2015; Sillaots et al., 2016) were examined and a concept map (see Figure 12) for game design elements for FLE was created. These elements have been clustered under five main elements identified by Kalmpourtzis (2018) on the basis of four main game elements proposed by game designer and scholar Schell (2014). These five main elements are *Pedagogy*, *Technology*, *Story*, *Aesthetics,* and *Mechanics*. Main elements are placed with Pedagogy being in the middle, meaning that pedagogy directly affects all other main elements. Additionally, other four main elements are in an indirect

relationship with each other. *Mechanics* can be identified as the elements essential for the game logic (e.g. game rules, number of players, interactions etc.). *Aesthetics* are affected by the culture of the game audience and have a huge impact on the experience and emotions of the players. *Story* is the series of events that can be a part of the game or be created by the players through their interactions with the game. *Technology* is the set of tools, resources, and information needed to put the game together (Kalmpourtzis, 2018). Since there is no similar questionnaire found to be developed in the FLE literature, the researcher developed the questionnaire questions by adhering to these main elements and sub-elements. The main elements and the sub-elements which are clustered in below them are presented in Figure 12. Figure 12 shows that Pedagogy main element has a total of 14, mechanics main element has a total of 8, aesthetics main element has a total of 3, story main element has a total of 5 and technology main element has a total of 3 direct relationships with other elements.

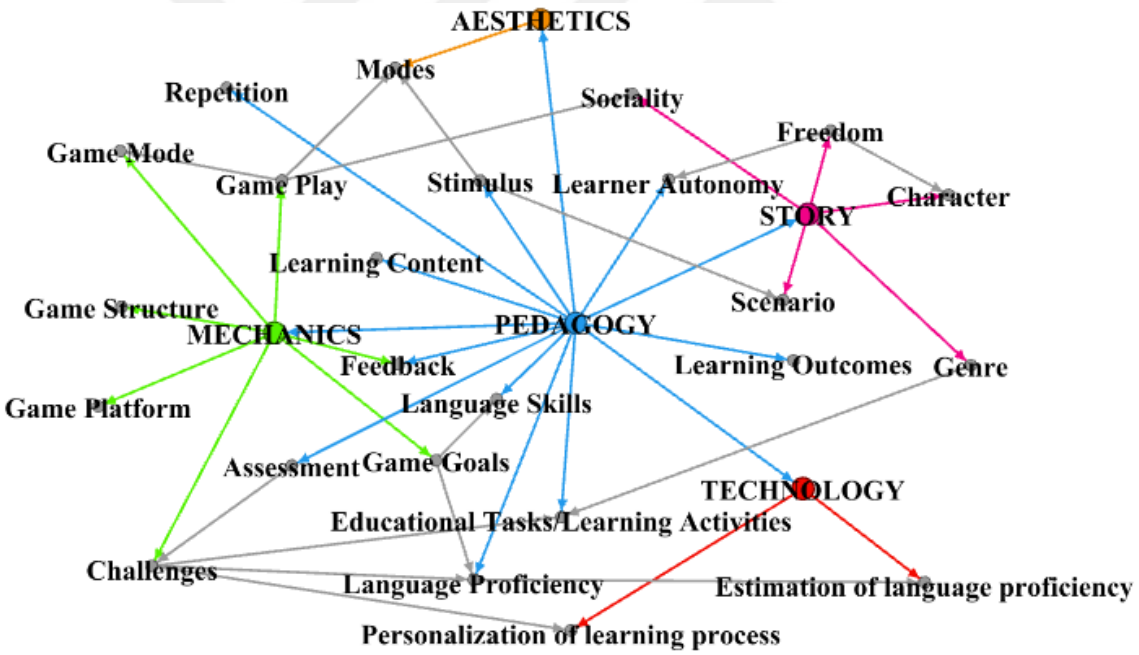

Figure 12. Concept map of the main- and sub-elements of the questionnaire questions

Questionnaire items were developed by considering the elements displayed in Figure 12. After the questionnaire items were developed, expert opinions were received from 3 experts in the field of English Language education and 1 expert in the field of serious games. After applying the suggested corrections, a pilot study of the questionnaire was conducted with 15 students and 15 lecturers of a state university's English preparatory education. In the pilot study, participants were presented with questionnaire items and

they were expected to fill The Question Appraisal System (QAS-99) to evaluate the questionnaire. The QAS-99 can be defined as a checklist consisting of eight steps to evaluate questionnaire and interview questions. Originally developed for telephone interviews, this system can also be used for other types of questionnaire types by omitting step 1 (Centers for Disease Control and Prevention, 2018). In questionnaires, total score (e.g. Likert-type items) does not carry any meaning; therefore, questionnaires do not possess psychometric properties such as validity and reliability (Ercan & Kan, 2004; Erkuş, 2010). Accordingly, the researcher did not measure the validity or reliability properties of the questionnaires developed. Consequently, after the pilot testing, questionnaires were finalized.

As a result, student questionnaire consisting of 29 items and lecturer questionnaire consisting of 14 items were developed as the final versions. The student questionnaire consists of 1 screening question, 3 demographic questions and 25 closed-ended questions regarding the game design elements. The Lecturer questionnaire consists of 1 screening question, 3 demographic questions and 10 closed-ended questions related to design elements. Detailed presentations of the student and lecturer questionnaires items in terms of content are given in Table 3 and Table 4, respectively. Questionnaires are provided in Appendix A and Appendix B.

Table 3. Detailed presentation of the student questionnaire items

Item No	Related Main Element	Short Introduction of Item	Item Type
1	-	Screening question	Closed-ended
2	-	Demographic question	Closed-ended
3	-	Demographic question	Closed-ended
4	-	Demographic question	Closed-ended
5	Aesthetics	Preference question	Closed-ended
6	Technology	Preference question	Closed-ended
7	Aesthetics	Preference question	Closed-ended
8	Aesthetics Pedagogy	Preference question	Closed-ended
9	Story Pedagogy	Preference question	Closed-ended
10	Pedagogy Story	Preference question	Closed-ended
11	Aesthetics Story Pedagogy	Preference question	Closed-ended

Table 3. (continued)

Question No	Related Main Element	Short Introduction Of Item	Question Type
12	Story Pedagogy	Preference question	Closed-ended
13	Pedagogy Story	Preference question	Closed-ended
14	Mechanics Technology Pedagogy	Preference question	Closed-ended
15	Pedagogy Mechanics	Preference question	Closed-ended
16	Pedagogy Mechanics	Preference question	Closed-ended
17	Pedagogy Mechanics	Preference question	Closed-ended
18	Pedagogy Mechanics Technology	Preference question	Closed-ended
19	Pedagogy Mechanics Technology	Preference question	Closed-ended
20	Pedagogy	Preference question	Closed-ended
21	Pedagogy Mechanics	Preference question	Closed-ended
22	Pedagogy Mechanics Technology	Preference question	Closed-ended
23	Aesthetics Pedagogy	Preference question	Closed-ended
24	Aesthetics Pedagogy	Preference question	Closed-ended
25	Pedagogy Mechanics	Preference question	Closed-ended
26	Pedagogy	Preference question	Closed-ended
27	Pedagogy Mechanics	Preference question	Closed-ended
28	Pedagogy	Preference question	Closed-ended
29	Pedagogy	Preference question	Closed-ended

Table 4. Detailed presentation of the lecturer questionnaire items

Question No	Related Sub-Element	Short Introduction Of Item	Question Type
1	-	Screening question	Closed-ended
2	-	Demographic question	Closed-ended
3	-	Demographic question	Closed-ended
4	-	Demographic question	Closed-ended
5	Aesthetics	Preference question	Closed-ended

Table 4. (continued)

Question No	Related Sub-Element	Short Introduction Of Item	Question Type
6	Pedagogy	Preference question	Closed-ended
7	Pedagogy Technology	Preference question	Closed-ended
8	Pedagogy	Preference question	Closed-ended
9	Pedagogy Mechanics Technology	Preference question	Closed-ended
10	Pedagogy Mechanics Technology	Preference question	Closed-ended
11	Technology	Preference question	Closed-ended
12	Pedagogy	Preference question	Closed-ended
13	Pedagogy	Preference question	Closed-ended
14	Pedagogy Mechanics	Preference question	Closed-ended

Table 3 and Table 4 show an overview of questionnaires' items in terms of their related sub-elements. As can be seen from the tables, student questionnaire consists of 10 items related to mechanics, 5 related to story, 6 related to aesthetics, 22 related to pedagogy and 5 related to technology. Lecturer questionnaire, on the other hand, consists of 3 questions related to mechanics, 1 related to aesthetics, 8 related to pedagogy, 4 related to technology and none of the questions were related to story.

3.4. Data Collection

Ethical approval was obtained from Süleyman Demirel University regarding the application of questionnaires (Appendix H). Afterward, application permissions were obtained from school of foreign languages providing preparatory education of randomly selected several state universities in Turkey (see Appendix C, Appendix D, Appendix E, Appendix F, Appendix G). Questionnaires developed for this study were applied online in state universities in various regions of Turkey in February, March and April of 2021. Data collection process is presented in Figure 13.

Figure 13. Data collection Process

3.5. Data Analysis

The quantitative data collected from the questionnaires were analyzed separately and the results obtained were interpreted together. Quantitative data were analyzed by descriptive statistics defined as techniques used to organize and describe the collected data (Salkind & Winter, 2018). Descriptive statistics were preferred for the analysis of quantitative data, because there is no need to make inferences from the answers given to the questionnaires instead the distribution of the answers given should be examined to answer the research questions of this study. Weighted network graph was chosen as the visualization type for the data as this graph presents not only the relationships among graph elements but also the strength of these relationships. Before data analysis, the data obtained through the questionnaires were prepared for analysis and examined whether there was any missing data. As a result of the examinations, no missing data was found in the data set.

4. FINDINGS

In this chapter, the responses given to the student and lecturer questionnaires are examined separately and under different headings. First, the results of the student questionnaire results are presented, and then the results of the lecturer questionnaire are presented with the same order. Descriptive statistics of the results are presented in tables.

4.1. Results of Student Questionnaire

This part will present the measures of frequency of the answers given to the 25 closed-ended items of the student questionnaire.

The first item of the questionnaire covered the user interface preferences. In this item, the participants could choose more than one option. When the answers are examined, it can be seen that there is not a big difference in numerical terms between the simple or detailed interface preferences of the participants, but the majority of the participants (N= 194) stated their preference is a user-friendly interface. The number of answers given by the students to item options is given in Table 5.

Table 5. Students' user-interface preferences

User-interface preferences	*n*	*% (265 participants)*
Simple	100	37.73
Detailed	84	31.69
User-friendly	194	73.2

Item 2 of the questionnaire was about the game platform preferences of the participants. More than one option could be selected. According to the response frequencies presented in Table 6, the majority of the participants stated that a digital game for learning English should be suitable for mobile platforms (N= 196), while a relatively large proportion stated that it should be suitable for computers (N= 216). A small number of participants indicated the console as a suitable platform for a digital game for learning English (N= 36).

Table 6. Students' game platform preferences

Game platform preferences	*n*	*% (265 participants)*
Mobile	196	73.96
Computer	216	81.5
Console	36	13.58

Item 3 was about the visual dimension of the game and the students were asked to choose between 2D or 3D. Examining the number of answers given to the options (see Table 7), it was observed that most of the students prefer a 3D game (N= 193).

Table 7. Students' visual dimension preferences

Visual dimension preferences	*n*	*% (265 participants)*
3D	193	72.83
2D	72	27.16

Item 4 was about the setting of the game. When the frequency of the answers given by the students to item is examined, it is seen that the number of students who prefer authentic (N= 148) or fantastic places (N= 117) is very close to each other (see Table 8).

Table 8. Students' game environment preferences

Game environment preferences	*n*	*% (265 participants)*
Authentic	148	55.84
Fantastic	117	44.15

In item 5, the game genre preferences of the students were asked. Eleven game types were presented as item options and the 'Other' option was provided for students to add game genres that are not covered in the eleven options. Game genres were determined from the study of Sherry and Pacheco (2006) and had been modified after receiving expert opinion and conducting pilot testing. More than one option could be selected in this item. Table 9 displays the number of answers given by the students.

Table 9. Students' game genre preferences

Game genre preferences	*n*	*% (265 participants)*
Strategy	167	63.01
Puzzle	127	47.92

Table 9. (continued)

Game genre preferences	*n*	*% (265 participants)*
Action/Adventure	146	55.09
Fantasy/Role-Playing	127	47.92
Sports	50	18.86
Simulation	117	44.15
Race	45	16.98
Hunting	45	16.19
Fighting	36	13.58
Trivia	113	42.64
Board Games	45	16.98

Table 10 shows the frequency of answers given to item 6 which was about the character design preferences and autonomy. Item 6 was presented with three options as 'pre-designed characters', 'designable characters' and 'pre-designed but modifiable characters (accessories and clothes etc.). The number of students who do not want to have any control over character design (N= 97) is much less than the number of students who want to be more autonomous in this sense (N= 152, pre-designed but modifiable; N= 16, designable).

Table 10. Students' character design preferences

Character design preferences	*n*	*% (265 participants)*
Pre-designed	97	36.6
Designable	16	6
Pre-designed but modifiable	152	57.35

Item 7 was a yes or no question regarding the open-world preferences of students. Open world feature is the freedom of the players to roam the large and elaborately prepared game area (Fox, 2013; Ryan, & Rigby, 2020). Table 11 shows that while open-world game is preferred by 233 students, only 32 students stated that they do not prefer it.

Table 11. Students' open-world preferences

Open-world preferences	*n*	*% (265 participants)*
Yes	233	87.92
No	32	12

Frequency of students' answers to item 8 is presented in Table 13. Only a minority of students (N= 20) indicated that a digital game designed for learning English should not have any scenario. Close number of students prefer authentic (N= 130) and fantastic (N= 115) scenarios.

Table 12. Students' scenario preferences

Scenario preferences	*n*	*% (265 participants)*
Authentic	130	49
Fantasy	115	43.39
There should be no scenario	20	7.5

Item 9 aimed to determine students' preferences regarding the linearity of storyline. Branching or non-linear storyline is the feature where the choices made by players during the game affect the storyline. Games with this feature offer more than one storyline (Adams, 2010). Table 13 presents that 229 students prefer branching/non-linear storyline feature while only a small number of students do not prefer this feature (N= 16) nor any storyline (N= 20).

Table 13. Students' preferences regarding players' choices influencing the storyline

Influencing preferences	*n*	*% (265 participants)*
Should influence	229	86.41
Should not influence	16	6
There should be no storyline	20	7.5

The frequencies of the answers given to item 10, which students are asked to answer in order to determine their game state preferences, are presented in Table 14. While only a minority of students stated preferring an offline game (N= 17), the majority of the students indicated preferring a game that offers both offline and online modes (N= 191).

Table 14. Students' game state preferences

Game state preferences	*n*	*% (265 participants)*
Online	57	72.83
Offline	17	20.37
Both online and offline	191	6.79

The frequencies of the answers given by the students to item 11, which aimed to determine the students' social interaction preferences in the game, are presented in Table 15. More than one option could be selected in this item. Competitive and collaborative social relationships among players are preferred more than having no relationship and playing individually (N= 94).

Table 15. Students' social relationship preferences

Social relationship preferences	*N*	*% (265 participants)*
Competitive	171	64.52
Collaborative	168	63.39
Individual	94	35.47
Should not be an online game	17	6.41

Item 12 aimed to determine the preferences of the students regarding the interaction with other game characters. More than one option could be selected in this item. In Table 16, the options and the frequencies of the selections made by the students are presented. According to the results, interactions between player-player and NPC (Non-Player Character) –player are preferred by the majority of the students (N= 171; N= 165). 62 students requested having interaction between NPC-NPC and only 6 students indicated that they prefer no interaction.

Table 16. Students' preference regarding the interactions among game characters

Game characters interaction preferences	*n*	*% (265 participants)*
Non-player character (NPC) – NPC (Commenting on the game)	62	23.39
Player – NPC (Assigning tasks to players, informing them about the game)	165	62.26
Player – Player (in online games)	171	64.52
No interaction	6	2.26

Table 17 illustrates the frequency of option responses for item 13, which aimed to determine the students' preferences regarding players' interaction types during the game. Majority of the students (N= 231) prefer both written and spoken interaction. Only a small number of students (N= 11) stated not preferring any interaction in the game.

Table 17. Students' preferences regarding the interaction types with other players

Social interaction preferences	*n*	*% (265 participants)*
Spoken	6	2.26
Written	28	10.56
Both written and spoken	231	87.16
Should not be any interaction	11	4.15

The preferences of the students regarding the difficulty of the game tasks were determined by item 14. As shown in Table 18, adaptive task difficulties are preferred by the majority of the students (N= 221).

Table 18. Students' preferences regarding game missions' difficulty level

Missions' difficulty level preferences	*n*	*% (265 participants)*
There should be missions with difficulty levels that adapt themselves to the player's language competence	221	83.39
There should be missions with predetermined difficulty levels, independent of the player's language competence	44	16.6

Item 15 was about the preferences of students concerning the difficulty of the educational content. Table 19 displays that 236 students stated that contents' difficulty should adapt itself to the player's level of knowledge, while the rest (N= 29) expressed their preference as predetermined difficulty levels.

Table 19. Students' preference regarding the difficulty of educational content (input)

Content's difficulty level preferences	*n*	*% (265 participants)*
Should adapt to the player's level of knowledge	236	89.05
Should be predetermined and independent of the player's level of knowledge	29	10.94

Students expressed their preference regarding the type of educational content in item 16. Table 20 presents that 194 students stated their preference for implicit learning and 71 students prefer explicit learning.

Table 20. Students' preferences regarding the type of educational content (input)

Content's type preferences	n	% (*265* participants)
Information should be given in a covert way (information is not given directly, it is obtained from the actions and environment)	194	73.2
Information should be given clearly (information is transferred directly)	71	26.79

Students' answers given to the item 17 were about their preferences for correction. Table 21 provides the frequencies of the given answers. 201 students expressed their preference of correction. Majority of the students stated that they prefer self-correction over direct correction (N= 201).

Table 21. Students' correction preferences

Correction preferences	*n*	*% (265 participants)*
Game should correct the player's mistake	64	24.15
Game should have the player correct the mistake	201	75.84

Item 18 was a yes-no question about students' learning styles influence on learning activities. As Table 22 presents, 246 students prefer personalization with their learning styles to effect learning activities.

Table 22. Students' preferences regarding learning activities changing according to the players' learning style

Learning style's influence on learning activities	*n*	*% (265 participants)*
Yes	246	92.83
No	19	7.16

Item 19 was about preferences regarding the mode of educational content. Participants could select multiple options or only 'All of them' option. Table 23 shows the frequencies of the answers given to the item. 179 students stated that they prefer several modes of educational content in a game.

Table 23. Students' preferences regarding the mode of educational content (input)

Mode of educational content preferences	*n*	*% (265 participants)*
Visual	65	24.52
Aural	67	25.28
Linguistic	61	23.01
Spatial	23	8.67
Gestural	9	3.39
All of them	179	67.54

Item 20 covered the use of mode(s) of educational content. Table 24 presents that 239 students expressed their preference for multimodal educational content rather than having one mode at a time.

Table 24. Students' preferences regarding the use of the mode of educational content (input)

Use of modes preferences	*n*	*% (265 participants)*
Only one type of mode should be used at a time	26	9.81
More than one type of modes should be used at the same time	239	90.18

Students' topic repetition type preferences were aimed to be determined with item 21. Table 25 shows the answers given by student to this item. While 239 students prefer the same content to be repeated in a different way, only 26 students want the same content to be repeated in the same way.

Table 25. Students' topic repetition type preferences

Topic repetition type preferences	*n*	*% (265 participants)*
Same (repeated in the same way)	26	9.81
Different (repeated in a different way)	239	90.18

Table 26 displays the answers given to the item 22, which covered the focus of assessment activities. Majority of the students (N= 210) expressed that they prefer assessment that aims higher order thinking skills, 55 students on the other hand stated preferring lower order thinking skills to be aimed in assessment activities.

Table 26. Students' preferences regarding the focus of assessment activities

The focus of assessment activities preferences	*n*	*% (265 participants)*
Should be based on the player's memorization and understanding	55	20.75
Should be based on the player's use and assessment of information	210	79.24

Students stated their assessment activity frequency preferences in item 23. Table 27 presents the frequencies of the answers given to item 24. What stands out from the data in Table 27 is that very few students prefer no assessment (N= 13) while almost half of the students (N= 124) indicated that there should be both summative and formative assessments in the game.

Table 27. Students' preferences regarding the frequency of assessment activities

Evaluation activities' focus preferences	*n*	*% (265 participants)*
Formative assessment	21	7.92
Summative assessment (end of the game)	107	40.37
Both formative and summative assessment	124	46.79
No assessment should be done	13	4.9

In item 24, students expressed their preferences regarding the language skills that should be targeted in a digital game. Students could select multiple options or only 'All of them' option in this item. As Table 28 presents, majority of the students (N= 200) prefer a holistic approach to the learning of language skills.

Table 28. Students' language skill preferences

Language skill preferences	*n*	*% (265 participants)*
Speaking	34	20.6
Listening	49	18.49
Reading	38	14.33
Writing	23	8.67
All of them	200	75.47

The last closed-ended item of the questionnaire, item 25, aimed to determine whether students prefer a meaning-focused or form-focused teaching approach in a digital game. Table 29 shows the number of students who selected the options. Focus on meaning

approach is preferred by the majority of the students (N= 177), while only 88 students prefer focus on form approach.

Table 29. Students' preferences regarding the teaching approach of language

Teaching approach preferences	*n*	*% (265 participants)*
Focus on meaning	177	66.79
Focus on form	88	33.2

4.2. Results of Lecturer Questionnaire

This part will present the measures of frequency of the answers given to the 10 closed-ended items of the lecturer questionnaire.

The questionnaire's first item for determining the preferences of lecturers regarding a digital game for learning English was about the game user-interface. Multiple options could be selected by the participants. Table 30 shows the frequency of responses given by the participants. User-friendly design is preferred by the majority of the participants. Simple or detailed design preferences did not vary in terms of frequency.

Table 30. Lecturers' user-interface preferences

User-interface preferences	*n*	*% (68 participants)*
Simple	25	36.76
Detailed	21	30.88
User-friendly	62	91.17

Item 2 was about what kind of educational resource the lecturers want the digital game to be. Table 31 displays the preference frequency of responses. Accordingly, no lecturer prefers a digital game to be the main source of instruction. The majority (N= 48) stated that it should be a supplementary source, and 20 lecturers stated preferring it to be an additional resource. In the questionnaire, while additional resource is used to cover the extra materials to reinforce the instruction that students do not have to engage, supplementary resource term is used to cover the materials students are required to engage in to support the instruction.

Table 31. Lecturers' resource type preferences

Resource type preferences	*n*	*% (68 participants)*
Main resource of instruction	0	0
Supplementary resource	48	70.58
Additional resource	20	29.41

Item 3 was related to the information lecturers request to track in the digital game. An 'other' option was presented to gather more detailed preferences regarding the question. Table 32 shows that lecturers prefer to track all of the information listed in the item and did not offer any other information they would like to track.

Table 32. Lecturers' preferences regarding learning analytics

Learning analytics preferences	*n*	*% (68 participants)*
Total time students spent in the game	36	52.94
Mistakes made by students	48	70.58
Students' progress levels	65	95.58
Students' in-game communications	39	57.35
Other	0	0

Lecturers' preferences regarding their role in digital game was tried to be determined by item 4. Teacher roles were taken from Lameras (2015). Accordingly, designer is designing experiences, materials and information resources. Player is taking an active part in the game by playing collaboratively or individually with students. Facilitator is establishing the connection between the game and real life, initiating in-game discussions and guiding students about the game. Motivator is rewarding and motivating students to use new or existing knowledge through in-game performance metrics. Evaluator is asking questions before and after the game to evaluate the performance of students and to set criteria to evaluate student performance in the game. Table 33 presents the preferences of lecturers regarding their role in a digital game. The most commonly preferred roles are facilitator (N= 59), motivator (N= 48), evaluator (N= 42), player (N= 23) and designer (N= 16) respectively.

Table 33. Lecturers' preferences ragerding their role in a digital game

Role preferences	*n*	*% (68 participants)*
Designer	16	23.52
Player	23	33.82
Facilitator	59	86.76
Motivator	48	70.58
Evaluator	42	61.76

In item 5, majority of the lecturers (N= 63) stated that they prefer to be able to intervene in the educational content in a digital game (see Table 34).

Table 34. Lecturers' preferences to intervene in educational content

Educational content intervention preferences	*n*	*% (68 participants)*
Yes	63	92.64
No	5	7.35

Item 6 aimed to investigate the needs related to control of lecturers over the learning activities. Teachers' preferences to intervene in learning activities are displayed in Table 35. Similar to the previous item results, majority of the lecturers (N= 60) stated that they want to intervene in learning activities.

Table 35. Lecturers' preferences to intervene in learning activities

Educational activities intervention preferences	*n*	*% (68 participants)*
Yes	60	88.23
No	8	11.76

Lecturers specified their digital game platform preferences in item 7. Table 36 shows that 68 lecturers prefer mobile, 52 of them prefer computer and only 2 of them prefer console as a platform for a digital game for English language learning.

Table 36. Lecturers' preferences for the digital game platform

Resource type preferences	*n*	*% (68 participants)*
Computer	52	76.47
Mobile	68	100
Console	2	2.94

Table 37 shows the frequencies of the responses of the lecturers to item 8. Accordingly, 46 lecturers stated that the digital game should be suitable for both in-class and out-of-class use. While 14 lecturers prefer a digital game for only out-of-class use and 8 lecturers want for only in-class use.

Table 37. Lecturers' game playing location preferences

Location preferences	*n*	*% (68 participants)*
Should be suitable for in-class use	8	11.76
Should be suitable for out-of-class	14	20.58
Should be suitable for both locations	46	67.64

According to the responses delivered to Item 9 (see Table 38), 36 lecturers stated that the digital game should include both the school curriculum content and the daily content not covered by this curriculum. While 22 lecturers prefer only daily content that is not in the school curriculum, only 10 lecturers stated that the game should only follow the school curriculum.

Table 38. Lecturers' educational content preferences

Educational content preferences	*n*	*% (68 participants)*
Should be in line with the school curriculum	10	14.7
Should include daily content not included in the school curriculum	22	32.35
Both content types should be included	36	52.94

According to the answers given to Item 10 (see Table 39), while only 8 lecturers stated that they prefer only one activity being either individual or group based, majority of the lecturers stated that they prefer to have both individual and group activities in the digital game.

Table 39. Lecturers' activity preferences

Activity preferences	*n*	*% (68 participants)*
Individual activities	8	11.76
Group activities	8	11.76
Both types of activities	52	76.47

4.3. Data Visualization

Weighted network graph was selected as the data visualization tool to display the relationship and strength of this relationship among elements and sub-elements. Here, strength is the frequency of answers given to the item options and relationship is the connections of sub-elements with the main elements and options with sub elements. All of the questionnaire items are related to one or more main elements and each item represented a sub-element and their options are types of sub-elements. Figure 14 displays the weighted network graph of student questionnaire results. Thickness of lines between sub-elements and options refer to the frequency of option selection in other words, the thicker the line, the more participants chose that option. The strength of the relationship among the main elements does not represent any meaning rather than them being in direct or indirect relation.

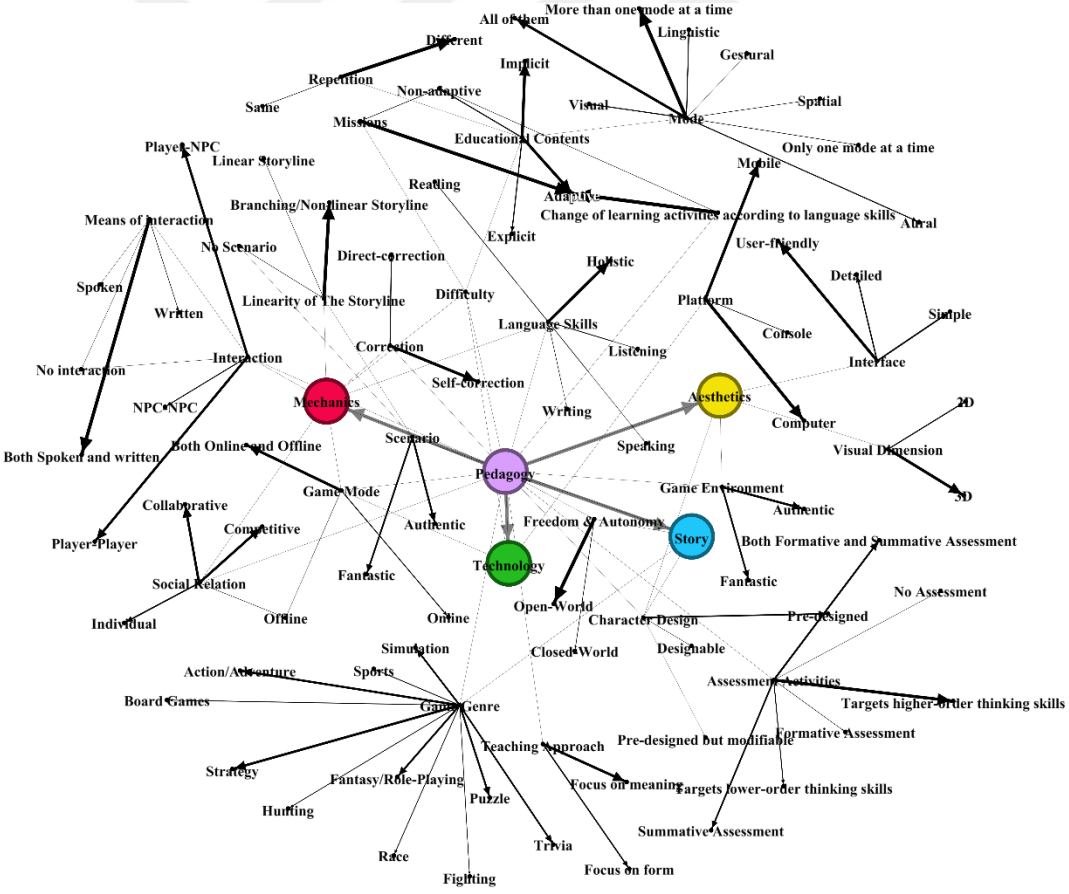

Figure 14. Weighted Network Graph of Student Questionnaire Results

Figure 15 shows the weighted network graph of lecturer questionnaire, closer inspection to the Figure 15 shows that lecturer questionnaire has no question related to the main element Story.

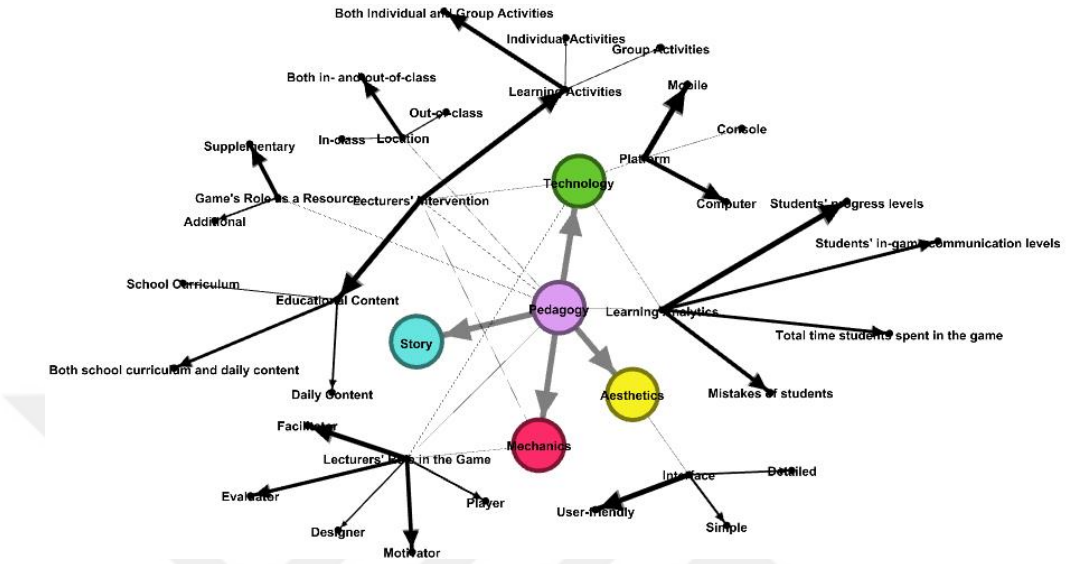

Figure 15. Weighted Network Graph of Lecturer Questionnaire Results

5. DISCUSSION & CONCLUSION

This chapter summarizes the results, interpretations on the results made by examining the relevant literature and contributions of this study. Firstly, participants' answers to the questionnaires are presented. The results of the student questionnaire and lecturer questionnaire are demonstrated by addressing the research questions. Finally, the implications of the study are briefly considered.

The present study is carried out to determine the digital game design element needs of the preparatory education students and lecturers. 2 questionnaires designed by the researcher were used as data collection tools in this cross-sectional survey study. In total, 333 participants, 265 students and 68 lecturers, from 5 randomly selected universities returned the questionnaires. The data were analyzed by descriptive statistics. Lastly, weighted network graph was preferred for data visualization.

In regard to the first research question, 'What are the digital game element needs of English preparatory education students for a digital game concerning English language learning?', the data collected with 25 items in the questionnaire prepared by the researcher were analyzed. Results of the student questionnaire show that the frequencies of some of the items' responses were found to be quite close to each other. However, there are also item responses that differ significantly in frequency. Findings are presented in the order of questionnaire items. According to the students, the user interface of the digital game should be simple and user-friendly. The platform for this game must be computer or mobile. This finding is consistent with the study of Setya Murti et al. (2019) which found that students prefer computer and mobile platforms for serious games rather than consoles. Lastly, game being playable on more than one platform can offer ubiquity to its users. Most of the students prefer 3D in terms of the visual dimension of the game; however, this result differs from the study of Ak and Kutlu (2017) which found that students value 2D digital games more than 3D digital games. According to the results, there is no consensus in terms of the game environment to be authentic or fantastic. Regarding the game genre, students mostly prefer strategy, action/adventure, fantasy/role-playing, puzzle, simulation and trivia genres, respectively. Other game genres are preferred by less than 20% of the students. Findings related to strategy, adventure, action, puzzle genres being mostly preferred genres

among students accord to that of Setya Murti et al. (2019)'s who found that students prefer mostly adventure, action, strategy, puzzle and fighting. Contrarily, fantasy/role-playing and simulation genres are the least commonly preferred serious game genres in their study. The reason for this difference may be due to their study being not field depended and that the participants of this study selected the game genres for a digital game aimed at learning English. In character design, it was found that more than half of the students want pre-designed but modifiable character design. Several published studies argue for the benefits of customizable character design; for instance, Lin et al. (2017) found that students perform better in remembering and understanding levels of Bloom's Taxonomy and identify themselves more with the characters. Similarly, Turkay and Kinzer (2015)'s study showed that with customizable characters, students not only identified themselves more with the characters but also developed their autonomy and agency. Open-world feature is requested by approximately 90% of the students. Open-world feature can cater a sense of autonomy in the game. On the other hand, according to the psychologist Scott Rigby, open-world feature can be frustrating to players by creating volition (GDC, 2018). Similar to the game environment preferences, students do not have a consensus in terms of authentic or fantastic types of scenarios. However, very few students stated that they do not want a scenario in the game. Branching/non-linear storyline was preferred by about 90% of the students. Branching storyline can offer students a more realistic experience with more immersive narratives. The majority of the students stated that the game should be played both online and offline. Competitive and collaborative relationship was chosen by a high number of students as the type of relationship that should be among players. Most students prefer to have communication between Player-NPC and Player-Player. Interactions and collaborative and competitive relationships among players may encourage students to share knowledge and experience by creating a social atmosphere (Gee, 2007). The percentage of students who want player-player communication to be in only one discourse is around 10% and below, while the majority of students want both written and spoken discourse to be used for communication between players. According to the majority of students, difficulties of game missions should be adjusted in accordance with the student's language competence. The same adaptive feature is requested by approximately 90% of students for the difficulty of the educational content in the game. According to Hendrix et al. (2019)'s study, adaptive difficulty is perceived to be more fun by the players of serious games. Similarly, Sampayo-Vargas et al.

(2013)'s study displayed fruitful effects on learning outcomes by providing students with opportunities to scaffold the learning. Additionally, considering the Flow Theory, immersion and engagement happen when the difficulty meets the capacity level of the player (Csikszentmihalyi, 1990). The majority of students stated that the presentation format of educational content should be implicit. Self-correction is preferred by more than 70% of students as the correction technique. More than 90% of students prefer learning activities to change according to students' learning styles. In the presentation of educational content, the majority of students prefer not to use only one type of mode, but to use all of them within the game. It was preferred by more than 90% of the students that more than one mode should be used together at the same time. As Cope and Kalantzis (2009) argue that each student has different mode preferences and a mode they feel comfortable with, the use of all modes in the game can enable the game to address the needs and preferences of more students. This argument can be supported by Sankey et al. (2010)'s study which shows that presenting educational content to students with more than one mode through multimedia tools increases students' comprehension, retention and enjoyment levels. The number of students who want the topic repetition to be different each time is considerably higher than the number of students who want to be repeated in the same way. Another sub-element that students mostly agreed on was that assessments should target higher-order thinking skills. Only less than 20% of students want lower-order thinking skills to be targeted. Additionally, the number of students who prefer only summative assessment and both summative and formative assessment is close. Contrary to the results of the questionnaire, summative assessment is not a highly preferred assessment method in educational games. Formative assessment, on the other hand, should be designed not to attract attention as it may disturb the engagement of the player during the game. In educational games where summative assessment will be preferred, attention should be paid to the compatibility of game activities and learning objects (Hummel et al., 2016). In terms of language skills that need to be covered in the game, the majority of students prefer a holistic approach. Lastly, most of the students stated that the focus on meaning approach should be adopted in the game.

The lecturer questionnaire was prepared and analyzed to answer the second research question 'What are the digital game element needs of English preparatory education lecturers for a digital game concerning English language learning?' Therefore, the

results of the lecturer questionnaire consisting of 10 items are presented in the order of the items. Lecturers stated that the design of the user-interface should be user-friendly, but there was no consensus on whether this interface should be simple or detailed. Consistent with the literature (Trevathan et al., 2016), no lecturer prefers game to be the main source of instruction, while majority prefers it to be supplementary material. Lecturers specified students' progress level, mistakes made by students, students' in-game communication levels and total time students spent in the game, respectively, as the student information they want to be able to track in the game. Many lecturers want to have the roles of facilitators, motivators and evaluators in the game. 90% of lecturers prefer to be able to interfere with educational content in the game. Similarly, nearly 90% of lecturers stated that they want to be able to intervene in learning activities. As for the platform of the game, while all lecturers prefer mobile, nearly 80% of them also prefer computer as the platform. In terms of educational content, they want both the school curriculum and the daily content that are not included in the school curriculum to be covered in the game. Lastly, lecturers prefer to have both individual and group activities in the game.

This recent study contributes to more than one research area by providing both research and practical-based implications. Firstly, the concept map (see Figure 12), developed to be used in the development of questionnaires, can help researchers to develop questionnaires for students of other ages and educational levels. Likewise, for game designers who design games for educational purposes, the data collected with the help of questionnaires can be used as a resource in game design for preparatory education. Additionally, this study can function as a basis for similar studies that can be done in different FLE fields. Lastly, lecturers in preparatory education can make a data-based game selection by considering the results of this study in choosing the appropriate digital game for their students.

6. SUGGESTIONS FOR FURTHER STUDIES

Although this recent study has made significant contributions to both game design and English language education fields, there are still more areas remaining to be elaborated and researched on the game design concerning English language education. The field of educational game design has presented several studies; however, there is a scarcity of research on digital game design and design elements in the field of FLE, especially in the field of English language education. Therefore, suggestions for further studies are presented below.

This study developed questionnaires in order to determine the digital game design element needs of preparatory education students and lecturers and applied these questionnaires in various universities in Turkey. In the preparation of these questionnaires, many studies in the literature were analyzed and expert opinions were received. Nevertheless, other sub-elements that can have a great impact on the design and the effect of the game on its target audience can be included to the questionnaire in future studies and the study can be replicated.

Future studies can be designed in qualitative or mixed way to answer the same research questions. Therefore, studies with different designs and methods can provide deeper and more comprehensive answers to the research questions. In addition, future studies may prevent the coverage error problem by conducting the questionnaires not only online but also in face-to-face environments (Couper, 2000; Dillman et al., 2014). Likewise, the external validity of the study can be increased by repeating the study with a larger group of participants or by using random sampling method for selecting participants.

Last, this study is a descriptive study and does not present any experimental results. Thus, clinical effect of determined digital game design elements for English language learning on preparatory education students and lecturers can be examined with the use of a digital game designed according to the results of this study or off-the-shelf games in future experimental studies.

In conclusion, even though there are several digital game design studies in the fields of game design and educational sciences, there is still very little known in terms of digital game design elements, especially in the field of English language education due to deficiency of related research. For this reason, descriptive and experimental studies in this field can be increased and diversified in order to develop the promising area DGBLL and show its real clinical effect.

REFERENCES

Adams, E. (2010). *Fundamentals of game design* (2nd ed.). New Riders.

Ahmad, M. (2019). Categorizing game design elements into educational game design fundamentals. In *Game Design and Intelligent Interaction*. IntechOpen.

Ahmad, M., Rahim, L. A., & Arshad, N. I. (2015). An analysis of educational games design frameworks from software engineering perspective. *Journal of Information and Communication Technology*, *14*, 123-151.

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In K. Kuhl & J. Beckmann (Eds.), Action control (pp. 11-39). Springer.

Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, *50*(2), 179-211.

Ak, O., & Kutlu, B. (2015). Comparing 2D and 3D game-based learning environments in terms of learning gains and student perceptions. *British Journal of Educational Technology*, *48*(1), 129-144. https://doi.org/10.1111/bjet.12346

Al-Azawi, R., Al-Faliti, F., & Al-Blushi, M. (2016). Educational gamification vs. game based learning: Comparative study. *International Journal of Innovation, Management and Technology*, *7*(4), 131-136. https://doi.org/10.18178/ijimt.2016.7.4.659

Aleven, V., Myers, E., Easterday, M., & Ogan, A. (2010, April). *Toward a framework for the analysis and design of educational games* [Paper presentation]. Third IEEE international conference on digital game and intelligent toy enhanced learning, Kaohsiung, Taiwan. https://ieeexplore.ieee.org/abstract/document/5463744

Alhadeff, E. (2010). *Serious Games to solve mysteries And Learn The History Of Biology* [Photograph]. Serious Game Market. https://www.seriousgamemarket.com/2010/11/serious-games-to-solve-mysteries-and.html

Alhadeff, E. (2013). *Serious Games As A Playground For Learning Math* [Photograph]. Serious Game Market. https://www.seriousgamemarket.com/2013/12/serious-games-as-playground-for.html

Alhadeff, E. (2014). *Serious Games Providing Real-World Spanish Language Practice* [Photograph]. Serious Game Market. https://www.seriousgamemarket.com/2014/03/serious-games-providing-real-world.html

Alhadeff, E. (2016). S*erious Games Introducing Students To Physical And Human Geography* [Photograph]. Serious Game Market. https://www.seriousgamemarket.com/2016/06/serious-games-introducing-students-to.html

Allen, L. K., Crossley, S. A., Snow, E. L., & McNamara, D. S. (2014). L2 writing practice: Game enjoyment as a key to engagement. *Language Learning & Technology*, *18*(2), 124-150.

Almeida, F., & Simoes, J. (2019). The role of serious games, gamification and Industry 4.0 tools in the Education 4.0 paradigm. *Contemporary Educational Technology*, *10*(2), 120-136.

Alpert, F. (2007). Entertainment software: Suddenly huge, little understood. *Asia Pacific Journal of Marketing and Logistics*, *19*(1), 87-100. https://doi.org/10.1108/13555850710720920

Alsawaier, R. S. (2018). The effect of gamification on motivation and engagement. *The International Journal of Information and Learning Technology*.

Amory, A. (2001). Building an educational adventure game: Theory, design, and lessons. *Journal of Interactive Learning Research*, *12*(2), 249-263.

Amory, A. (2006). Game object model version II: A theoretical framework for educational game development. *Educational Technology Research and Development*, *55*(1), 51-77. https://doi.org/10.1007/s11423-006-9001-x

Amory, A., Naicker, K., Vincent, J., & Adams, C. (1999). The use of computer games as an educational tool: Identification of appropriate game types and game elements. *British Journal of Educational Technology*, *30*(4), 311-321. https://doi.org/10.1111/1467-8535.00121

Anderson, T. A. F., Reynolds, B. L., Yeh, X. P., & Huang, G. Z. (2008, December). *Video Games in the English as a Foreign Language Classroom* [Paper presentation]. Second IEEE International Conference on Digital Game and Intelligent Toy Enhanced Learning. https://doi.org/10.1109/DIGITEL.2008.39

Ankara Kalkınma Ajansı. (2020). Dijital oyun sektörü raporu. Ankara Kalkınma Ajansı, Ankara. Retrieved November 11, 2020, from https://www.ankaraka.org.tr/archive/files/yayinlar/ankaraka-dijital-oyun-sektoru.pdf

Ansteeg, L. W. (2015). Incidental lexicon acquisition through playful interaction. *International Journal of Emerging Technologies in Learning (iJET)*, *10*(1), 4. https://doi.org/10.3991/ijet.v10i1.4156

Arnab, S., Lim, T., Carvalho, M. B., Bellotti, F., De Freitas, S., Louchart, S., Suttie, N., Berta, R., & De Gloria, A. (2014). Mapping learning and game mechanics for serious games analysis. *British Journal of Educational Technology*, *46*(2), 391-411. https://doi.org/10.1111/bjet.12113

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological review*, *84*(2), 191.

Bandura, A. (1990). Perceived self-efficacy in the exercise of personal agency. *Journal of Applied Sport Psychology*, *2*(2), 128-163. https://doi.org/10.1080/10413209008406426

Beatman, T., & Duff, R. (2019). Games in learning: Shedding light on a problematic taxonomy. *EAI Endorsed Transactions on Game-Based Learning*, *5*(17), 156151. https://doi.org/10.4108/eai.13-9-2018.156151

Bellotti, F., Kapralos, B., Lee, K., Moreno-Ger, P., & Berta, R. (2013). Assessment in and of Serious Games: An Overview. *Advances in Human-Computer Interaction*, 1-11. https://doi.org/10.1155/2013/136864

Bellotti, F., Ott, M., Arnab, S., Berta, R., de Freitas, S., Kiili, K., & De Gloria, A. (2011, October). Designing serious games for education: from pedagogical principles to game mechanisms. *Proceedings of the 5th European Conference on Games Based Learning* (pp. 26-34). Academic Publishing Limited.

Benyon, D. (2019). *Designing user experience: A guide to HCI, UX and interaction design* (4th ed.). Pearson UK.

Berns, A., Gonzalez-Pardo, A., & Camacho, D. (2013). Game-like language learning in 3-D virtual environments. *Computers & Education, 60*(1), 210–220. https://doi.org/10.1016/j.compedu.2012.07.001

Blumler, J. G. (1979). The role of theory in uses and gratifications studies. *Communication research*, *6*(1), 9-36.

Bong, M., & Clark, R. E. (1999). Comparison between self-concept and self-efficacy in academic motivation research. *Educational psychologist*, *34*(3), 139-153.

Boyle, E. A., Connolly, T. M., Hainey, T., & Boyle, J. M. (2012). Engagement in digital entertainment games: A systematic review. *Computers in Human Behavior, 28*(3), 771–780. https://doi.org/10.1016/j.chb.2011.11.020

Bösche, W., & Kattner, F. (2011). Field Report: Using a Violent Multiplayer Game as a Virtual Classroom for a Course on Violent Video Games. In P. Felicia (Ed.), *Handbook of Research on Improving Learning and Motivation through Educational Games: Multidisciplinary Approaches* (pp. 777-805). IGI Global. http://doi:10.4018/978-1-60960-495-0.ch035

Brisson, A., Pereira, G., Prada, R., Paiva, A., Louchart, S., Suttie, N., ... & Oliveira, M. (2012, October). Artificial intelligence and personalization opportunities for serious games. *Proceedings of the AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment*, *8*(1).

Bytheway, J. (2014). In-game culture affects learners' use of vocabulary learning strategies in massively multiplayer online role-playing games. *International Journal of Computer-Assisted Language Learning and Teaching*, *4*(4), 1-13. https://doi.org/10.4018/ijcallt.2014100101

Cabraja, A. (2016). *The effects of video games on the receptive vocabulary proficiency of Swedish ESL students.* Bachelor Degree Project, Department of English, English Linguistics, Stockholms universitet. www.divaportal.org/smash/get/diva2:936329/FULLTEXT01.pdf

Carras, M. C., Kowert, R., & Quandt, T. (2019). Psychological effects of gaming. In A. Attrill-Smith, C. Fullwood, M. Keep, & D. J. Kuss (Eds.), *The Oxford Handbook of Cyberpsychology*. Oxford University Press.

Catalano, C. E., Luccini, A. M., & Mortara, M. (2014). Guidelines for an effective design of serious games. *International Journal of Serious Games, 1*(1). https://doi.org/10.17083/ijsg.v1i1.8

Centers for Disease Control and Prevention. (2018, August). *Checklist to Evaluate the Quality of Questions*. Retrieved March 8, 2021, from https://www.cdc.gov/healthyyouth/evaluation/pdf/brief15.pdf

Ceylaner, S., & Yelken, T. Y. (2017). Ortaöğretim öğrencilerinin, dijital oyunların İngilizce kelime öğrenimine katkısına yönelik görüşleri. *Bartın Üniversitesi Eğitim Fakültesi Dergisi*, *6*(1), 346-364.

Charsky, D. (2010). From edutainment to serious games: A change in the use of game characteristics. *Games and Culture, 5*(2), 177-198. https://doi.org/10.1177/1555412009354727

Check, J., & Schutt, R. K. (2012). *Research methods in education*. Sage Publications.

Chen, X., Zou, D., Cheng, G., & Xie, H. (2020). Detecting latent topics and trends in educational technologies over four decades using structural topic modeling: A retrospective of all volumes of computers & education. *Computers & Education*, *151*, 103855. https://doi.org/10.1016/j.compedu.2020.103855

Clark, D. B., Tanner-Smith, E. E., & Killingsworth, S. S. (2016). Digital Games, Design, and Learning. *Review of Educational Research*, *86*(1), 79–122. https://doi.org/10.3102/0034654315582065

Cope, B., & Kalantzis, M. (2009). "Multiliteracies": New literacies, new learning. *Pedagogies: An International Journal*, *4*(3), 164-195. https://doi.org/10.1080/15544800903076044

Cornillie, F., Thorne, S. L., & Desmet, P. (2012). ReCALL special issue: Digital games for language learning: challenges and opportunities. *ReCALL*, *24*(3), 243-256. https://doi.org/10.1017/s0958344012000134

Couper, M. (2000). Review: Web Surveys: A Review of Issues and Approaches. *The Public Opinion Quarterly*, *64*(4), 464-494. http://www.jstor.org/stable/3078739

Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. Harper & Row.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, *13*(3), 319-340. https://doi.org/10.2307/249008

De Freitas, S. (2018). Are games effective learning tools? A review of educational games. *Journal of Educational Technology & Society*, *21*(2), 74-84. http://www.jstor.org/stable/26388380

De Hesselle, L. C., Rozgonjuk, D., Sindermann, C., Pontes, H. M., & Montag, C. (2021). The associations between Big Five personality traits, gaming motives, and self-reported time spent gaming. *Personality and Individual Differences*, *171*. https://doi.org/10.1016/j.paid.2020.110483

De Lope, R. P., Medina-Medina, N., Soldado, R. M., Garcia, A. M., & Gutierrez-Vela, F. L. (2017, September). *Designing educational games: Key elements and methodological approach* [Paper presentation]. 9th International Conference on Virtual Worlds and Games for Serious Applications (VS-Games). https://doi.org/10.1109/VS-GAMES.2017.8055812

Deci, E. L., & Ryan, R. M. (2000). The" what" and" why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological inquiry*, *11*(4), 227-268.

Deci, E. L., & Ryan, R. M. (2008). Self-determination theory: A macrotheory of human motivation, development, and health. *Canadian psychology/Psychologie canadienne*, *49*(3), 182.

Demirbilek, M. (2009). Use of electronic games in distance learning as a tool for teaching and learning. In P. Rogers, G. Berg, J. Boettcher, C. Howard, L. Justice, & K. Schenk (Eds.), *Encyclopedia of Distance Learning* (2nd ed., pp. 2209-2223). IGI Global.

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011, September). From game design elements to gamefulness: defining" gamification". *Proceedings of the 15th international academic MindTrek conference: Envisioning future media environments* (pp. 9-15).

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method* (4th ed.). John Wiley & Sons.

Ebrahimzadeh, M. (2017). Readers, players, and watchers: EFL students' vocabulary acquisition through digital video games. *English Language Teaching*, *10*(2). https://doi.org/10.5539/elt.v10n2p1

Ercan, İ., & İsmet, K. A. N. (2004). Ölçeklerde güvenirlik ve geçerlik. *Uludağ Üniversitesi Tıp Fakültesi Dergisi, 30*(3), 211-216.

Erkuş, A. (2007). Ölçek geliştirme ve uyarlama çalışmalarında karşılaşılan sorunlar. *Türk Psikoloji Bülteni, 13* (40), 17-25.

Erkuş, A. (2010). Psikometrik terimlerin Türkçe karşılıklarının anlamları ile yapılan işlemlerin uyuşmazlığı. *Eğitimde ve Psikolojide Ölçme ve Değerlendirme Dergisi, 1*(2), 72-77.

Faiella, F. & Ricciardi, M. (2015). Gamification and learning: a review of issues and research. *Journal of e-Learning and Knowledge Society*, *11*(3). Italian e-Learning Association. Retrieved December 29, 2020 from https://www.learntechlib.org/p/151920/.

Felicia, P. (2009). *Digital games in schools: A handbook for teachers*. European Schoolnet, euN Partnership AiSbl: Belgium.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Addison-Wesley.

Flanagan, M. (2009). *Critical play: Radical game design*. MIT Press.

Fox, M. (2013). *The video games guide: 1,000+ arcade, console and computer games, 1962-2012, 2d ed* (2nd ed.). McFarland.

Frederick, C. M., & Ryan, R. M. (1995). Self-determination in sport: A review using cognitive evaluation theory. *International journal of sport psychology*.

Gaming in Turkey. (2020). *Türkiye Oyun Sektörü 2019 Raporu*. Retrieved November 11, 2020, from https://www.gaminginturkey.com/turkiye-oyun-sektoru-raporu-2019.pdf

GDC. (2018, March 12). *The Freedom Fallacy: Understanding "Player Autonomy" in Game Design* [Video]. YouTube. https://www.youtube.com/watch?v=3vct13OhIio

Gee, J. P. (2007). *Good video games + good learning: Collected essays on video games, learning, and literacy*. Peter Lang.

Godwin-Jones, R. (2014). Games in language learning: Opportunities and challenges. *Language Learning & Technology, 18*(182), 9–19. Retrieved from http://llt.msu.edu/issues/june2014/emerging.pdf

Gough, C. (2020, October 15). *Number of active video gamers worldwide from 2015 to 2023(in billions)*. Statista. Retrieved December 23, 2020, from https://www.statista.com/statistics/748044/number-video-gamers-world/

Graham, L. T., & Gosling, S. D. (2013). Personality profiles associated with different motivations for playing world of Warcraft. *Cyberpsychology, Behavior, and Social Networking*, *16*(3), 189-193. https://doi.org/10.1089/cyber.2012.0090

Gregory, S., Reiners, T., Wood, L. C., & Teräs, H. (2015). Gamification and digital games-based learning in the classroom. In M. Henderson & G. Romeo (Eds.), *Teaching and Digital Technologies: Big Issues and Critical Questions* (p. 127–141). Cambridge University Press.

Haagsma, M. C., King, D. L., Pieterse, M. E., & Peters, O. (2012). Assessing problematic video gaming using the theory of planned behavior: A longitudinal study of Dutch young people. *International Journal of Mental Health and Addiction*, *11*(2), 172-185. https://doi.org/10.1007/s11469-012-9407-0

Hamari, J. (2013). Transforming homo economicus into homo ludens: A field experiment on gamification in a utilitarian peer-to-peer trading service. *Electronic commerce research and applications*, *12*(4), 236-245.

Hamari, J. (2017). Do badges increase user activity? A field experiment on the effects of gamification. *Computers in human behavior*, *71*, 469-478.

Hamari, J., & Eranti, V. (2011, August). *Framework for Designing and Evaluating Game Achievements* [Paper presentation]. Digra 2011 Conference: Think Design Play, Hilversum. http://www.digra.org/wp-content/uploads/digital-library/11307.59151.pdf

Hamari, J., & Keronen, L. (2017). Why do people play games? A meta-analysis. *International Journal of Information Management*, *37*(3), 125-141. https://doi.org/10.1016/j.ijinfomgt.2017.01.006

Hendrix, M., Bellamy-Wood, T., McKay, S., Bloom, V., & Dunwell, I. (2019). Implementing adaptive game difficulty balancing in serious games. *IEEE Transactions on Games*, *11*(4), 320-327. https://doi.org/10.1109/tg.2018.2791019

Hitosugi, C. I., Schmidt, M., & Hayashi, K. (2014). Digital game-based learning in the L2 classroom: The impact of the UN's off-the-shelf videogame, food force, on learner affect and vocabulary retention. *CALICO Journal*, *31*(1), 19–39.

Hummel, H. G., Joosten-ten Brinke, D., Nadolski, R. J., & Baartman, L. K. (2016). Content validity of game-based assessment: Case study of a serious game for ICT managers in training. *Technology, Pedagogy and Education*, *26*(2), 225-240. https://doi.org/10.1080/1475939x.2016.1192060

Hung, H. T., Chang, J. L., & Yeh, H. C. (2016, July). *A Review of Trends in Digital Game-Based Language Learning Researc*h [Paper presentation]. IEEE 16th International Conference on Advanced Learning Technologies (ICALT). https://doi.org/10.1109/ICALT.2016.9

Hung, H. T., Yang, J. C., Hwang, G. J., Chu, H. C., & Wang, C. C. (2018). A scoping review of research on digital game-based language learning. *Computers & Education*, *126* , 89-104.

Hunicke, R., LeBlanc, M., & Zubek, R. (2004). MDA: A formal approach to game design and game research. *Proceedings of the AAAI Workshop on Challenges in Game AI*, *4*(1).

Hwang, G., Hsu, T., Lai, C., & Hsueh, C. (2017). Interaction of problem-based gaming and learning anxiety in language students' English listening performance and progressive behavioral patterns. *Computers & Education*, *106*, 26-42. https://doi.org/10.1016/j.compedu.2016.11.010

Jackson, S. A. (2012). Flow. In R. Ryan (Ed.), The oxford handbook of human motivation (p. 127). OUP USA.

Jensen, S. H. (2017). Gaming as an English language learning resource among young children in Denmark. *CALICO Journal, 34*(1), 1–19.

Kalmpourtzis, G. (2018). *Educational Game Design Fundamentals: A journey to creating intrinsically motivating learning experiences*. CRC Press.

Kapp, K. M. (2012). *The gamification of learning and instruction.* Wiley.

Kiili, K. (2007). Foundation for problem-based gaming. *British Journal of Educational Technology*, *38* (3), 394-404.

Kiili, K., (2010). *Educational Games: Design, Learning, and Applications*. Nova Publishers.

Lameras, P. (2015). Essential features of serious games design in higher education. *Learning*, *4*(5).

Lameras, P., Arnab, S., Dunwell, I., Stewart, C., Clarke, S., & Petridis, P. (2016). Essential features of serious games design in higher education: Linking learning attributes to game mechanics. *British journal of educational technology*, *48*(4), 972-994.

Landers, R. N. (2014). Developing a theory of gamified learning: Linking serious games and gamification of learning. *Simulation & gaming*, *45*(6), 752-768.

Lavrakas, P. J. (2008). *Encyclopedia of Survey Research Methods*. Sage Publications.

Li, J. (2020). A systematic review of video games for second language acquisition. In P. M. Sullivan, J. L. Lantz, & B. A. Sullivan (Eds.), *Handbook of Research on Integrating Digital Technology With Literacy Pedagogies* (pp. 472-499). IGI Global.

Lin, C. J., Hwang, G. J., Fu, Q. K., & Chen, J. F. (2018). A flipped contextual game-based learning approach to enhancing EFL students' English business writing performance and reflective behaviors. *Journal of Educational Technology & Society*, *21*(3), 117-131.

Lin, L., Parmar, D., Babu, S. V., Leonard, A. E., Daily, S. B., & Jörg, S. (2017). How character customization affects learning in computational thinking. *Proceedings of the ACM Symposium on Applied Perception*. https://doi.org/10.1145/3119881.3119884

Liu, W. (2015). A historical overview of uses and gratifications theory. *Cross-Cultural Communication*, *11*(9), 71-78.

McCrae, R. R., & Costa, P. T. (1987). Validation of the five-factor model of personality across instruments and observers. *Journal of Personality and Social Psychology*, *52*(1), 81-90. https://doi.org/10.1037/0022-3514.52.1.81

Mitgutsch, K., & Alvarado, N. (2012). Purposeful by design? *Proceedings of the International Conference on the Foundations of Digital Games-FDG'12.* https://doi.org/10.1145/2282338.2282364

Nardi, B., Ly, S. & Harris, J. (2007, February). *Learning Conversations in World of Warcraft* [Paper presentation]. 40th Annual Hawaii International Conference on System Sciences (HICSS'07). https://doi.org/10.1109/HICSS.2007.321

Peterson, M. (2012). EFL learner collaborative interaction in Second Life. *Recall*, *24*(1), 20-39. https://doi.org/10.1017/S0958344011000279

Peterson, M. (2013). *Computer games and language learning*. Palgrave Macmillan.

Ponto, J. (2015). Understanding and evaluating survey research. *Journal of the advanced practitioner in oncology*, *6*(2), 168–171. https://doi.org/10.6004/jadpro.2015.6.2.9

Prensky, M. (2001a). *Digital game-based learning*. New York, NY: McGraw-Hill

Prensky, M. (2001b). The games generations: How learners have changed. *Digital game-based learning.*

Prensky, M. (2003). Digital game-based learning. *Computers in Entertainment (CIE)*, *1*(1), 21-21.

Rama, P. S., Black, R. W., van Es, E., & Warschauer, M. (2012). Affordances for second language learning in World of Warcraft. *ReCALL*, *24*(3), 322–338.

Ranalli, J. (2008). Learning English with the sims: Exploiting authentic computer simulation games for L2 learning. *Computer Assisted Language Learning*, *21*(5), 441-455. https://doi.org/10.1080/09588220802447859

Ratan, R., & Ritterfeld, U. (2009). Classifying serious games. In U. Ritterfeld, M. Cody, & P. Vorderer (Eds.), *Serious Games: Mechanisms and Effects*. Routledge.

Reinders, H. (2017). Digital games and second language learning. In S. Thorne & S. May (Eds.), *Language, Education and Technology. Encyclopedia of Language and Education* (3rd ed.). https://doi.org/10.1007/978-3-319-02237-6_26

Reinders, H., & Wattana, S. (2012). Talk to Me! Games and Students' Willingness to Communicate. In H. Reinders (Ed.), *Digital Games in Language Learning and Teaching*. Palgrave Macmillan.

Romero, M., Usart, M., & Ott, M. (2014). Can serious games contribute to developing and sustaining 21st century skills? *Games and Culture*, *10*(2), 148-177. https://doi.org/10.1177/1555412014548919

Roungas, V. (2015). *A Model-driven Framework for Educational Game Design*. (Unpublished master's thesis). Utrecht University, Utrecht, Netherlands.

Ryan, R. M., & Rigby, C. S. (2020). Motivational foundations of game-based learning. In J. L. Plass, R. E. Mayer, & B. D. Homer (Eds.), *Handbook of Game-Based Learning* (pp. 153-176). The MIT Press.

Ryu, D. (2013). Play to learn, learn to play: Language learning through gaming culture. *ReCALL*, *25*(2), 286-301. https://doi.org/10.1017/s0958344013000050

Sailer, M., & Homner, L. (2020). The Gamification of learning: a Meta-analysis. *Educational Psychology Review*, *32*(1), 77-112. https://doi.org/10.1007/s10648-019-09498-w

Salkind, N. J., & Winter, R. J. (2018). *Study guide for psychology to accompany Neil J. Salkind's statistics for people who (Think they) hate statistics* (6th ed.). SAGE Publications.

Sampayo-Vargas, S., Cope, C. J., He, Z., & Byrne, G. J. (2013). The effectiveness of adaptive difficulty adjustments on students' motivation and learning in an educational computer game. *Computers & Education*, *69*, 452-462. https://doi.org/10.1016/j.compedu.2013.07.004

Sankey, M., Birch, D., & Gardiner, M. (2010). Engaging students through multimodal learning environments: The journey continues. *Proceedings ASCILITE 2010: 27th annual conference of the Australasian Society for Computers in Learning in Tertiary Education: Curriculum, technology and transformation for an unknown future* (pp. 852-863). University of Queensland.

Savonitti, G., & Mattar, J. (2018). Entertainment games for teaching English as a second language. *International Journal for Innovation Education and Research*, *6*(2), 188-207. https://doi.org/10.31686/ijier.vol6.iss2.970

Schaaf, R. L. (2017). *Setting the record straight: The difference between digital game-based learning, Gamification, and other related buzzwords*. Blog | Amplify. Retrieved April 2, 2021, from https://blog.amplify.com/gaming-buzzwords

Schell, J. (2014). *The Art of Game Design: A book of lenses (2nd edition)*. London & New York: CRC Press.CRC press.

Schwienhorst, K. (2002). Evaluating tandem language learning in the MOO: Discourse repair strategies in a bilingual internet project. *Computer Assisted Language Learning*, *15*(2), 135-145. https://doi.org/10.1076/call.15.2.135.8194

Setya Murti, H. A., Dicky Hastjarjo, T., & Ferdiana, R. (2019, July). *Platform and Genre Identification for Designing Serious Games* [Paper presentation]. 5th International Conference on Science and Technology (ICST). https://doi.org/10.1109/icst47872.2019.9166177

Sherry, J., & Pacheco, A. (2006). Matching computer game genres to educational outcomes. *The Electronic Journal of Communication*, *16*.

Sillaots, M. (2015). Game Elements. Retrieved 16 November 2020, from http://htk.tlu.ee/icampus/mod/file/download.php?file_guid=220182

Sillaots, M., Jesmin, T., & Rinde, A. (2016, October). Survey for mapping game elements. *Proceedings of the 10th European Conference on Game Based Learning ECGBL* (pp. 617-626).

Simon, H. A. (1957). *Administrative Behaviour: a Study of Decision Making Prosesses in Administrative Organization*. The Free Press.

Sitzmann, T. (2011). A meta-analytic examination of the instructional effectiveness of computer-based simulation games. *Personnel Psychology, 64*, 489–528. doi:10.1111/ j.1744-6570.2011.01190.x

Statista Research Department. (2021, January 18). *Gaming - Statistics & Facts*. Statista. Retrieved February 18, 2021, from https://www.statista.com/topics/1680/gaming/

Suh, S., Kim, S., & Kim, N. (2010). Effectiveness of MMORPG-based instruction in elementary English education in Korea. *Journal Of Computer Assisted Learning*, *26*(5), 370-378. https://doi.org/10.1111/j.1365-2729.2010.00353.x

Susi, T., Johannesson, M., & Backlund, P. (2007). Serious games: An overview.

Şengün, S. (2018). Videogame engagement: Psychological frameworks. *Encyclopedia of Computer Graphics and Games*, 1-7. https://doi.org/10.1007/978-3-319-08234-9_158-1

Tan, E. S., & Jansz, J. (2008). The game experience. In P. Hekkert & H. N. J. Schifferstein (Eds.), *Product Experience* (pp. 531-556). Elsevier.

Taub, M., Sawyer, R., Smith, A., Rowe, J., Azevedo, R., & Lester, J. (2020). The agency effect: The impact of student agency on learning, emotions, and problem-solving behaviors in a game-based learning environment. *Computers & Education*, *147*, 103781. https://doi.org/10.1016/j.compedu.2019.103781

Trevathan, M., Peters, M., Willis, J., & Sansing, L. (2016). Serious games classroom implementation: Teacher perspectives and student learning outcomes. *Society for Information Technology & Teacher Education International Conference Proceeding* (pp. 624-631). Association for the Advancement of Computing in Education (AACE).

Turkay, S., & Kinzer, C. K. (2015). The effects of avatar-based customization on player identification. *Gamification*, 247-272. https://doi.org/10.4018/978-1-4666-8200-9.ch012

Van Eck, R. (2006). Digital game-based learning: It's not just the digital natives who are restless. *EDUCAUSE review*, *41*(2), 16.

Van Eck, R. (2015). SAPS and digital games: Improving mathematics transfer and attitudes in schools. In T. Lowrie & R. Jorgensen (Eds.), *Digital games and mathematics learning: Potential, promises and pitfalls* (pp. 141–173). New York, NY: Springer.

Visser, P. S., Krosnick, J. A., & Lavrakas, P. J. (2000). Survey research. In H. Reis & C. H. Judd (Eds.), *Handbook of Research Methods in Social and Personality Psychology* (pp. 223-252). Cambridge University Press.

Vogel, J. J., Vogel, D. S., Cannon-Bowers, J., Bowers, C. A., Muse, K., & Wright, M. (2006). Computer gaming and interactive simulations for learning: A meta-analysis. *Journal of Educational Computing Research*, *34*, 229–243.

Vos, N., Van Der Meijden, H., & Denessen, E. (2011). Effects of constructing versus playing an educational game on student motivation and deep learning strategy use. *Computers & Education*, *56*(1), 127-137.

Winn, B. M. (2009). The design, play, and experience framework. In *Handbook of research on effective electronic gaming in education* (pp. 1010-1024). IGI Global.

Winn, B. M. (2008). The Design, Play, and Experience Framework. In R. E. Ferdig (Ed.), *Handbook of Research on Effective Electronic Gaming in Education* (pp. 1010-1024). Information Science Reference.

Worldometers.info. (2020, December 23). *World population clock: 7.8 billion people (2020)*. Worldometer - real time world statistics. Retrieved December 23, 2020, from https://www.worldometers.info/world-population/

Wouters, P., van Nimwegen, C., van Oostendorp, H., & van der Spek, E. D. (2013). A meta-analysis of the cognitive and motivational effects of serious games. *Journal of Educational Psychology*, *105*, 249–265. doi:10.1037/a0031311

Wu, T. T., & Huang, Y. M. (2017). A mobile game-based English vocabulary practice system based on portfolio analysis. *Journal of Educational Technology & Society*, *20*(2), 265-277.

Yang, Q., Chang, S., Hwang, G., & Zou, D. (2020). Balancing cognitive complexity and gaming level: Effects of a cognitive complexity-based competition game on EFL students' English vocabulary learning performance, anxiety and behaviors. *Computers & Education*, *148*. https://doi.org/10.1016/j.compedu.2020.103808

Yudintseva, A. (2015). Synthesis of research on video games for the four second language skills and vocabulary practice. *Open Journal of Social Sciences*, *03*(11), 81-98. http://doi.org/10.4236/jss.2015.311011

APPENDICES

Hazırlık Eğitiminde Dijital Oyun Tabanlı Dil Öğretimi İçin Dijital Oyun Elementlerine Yönelik İhtiyaç Analizi (Öğrenci Anketi)

1. Dijital oyun oynarım (mobil, bilgisayar, konsol oyunları).
   ☐Evet
   ☐Hayır

2. Cinsiyetiniz nedir?
   ☐Kadın
   ☐Erkek

3. Kaç yaşındasınız?
   ☐20'den küçük
   ☐20-24
   ☐25-29
   ☐30-34
   ☐35-39
   ☐40-44
   ☐45-49
   ☐50'den büyük

4. Hangi okulda eğitim görmektesiniz?
   ☐Süleyman Demirel Üniversitesi
   ☐Mardin Artuklu Üniversitesi
   ☐Ankara Hacı Bayram Veli Üniversitesi
   ☐Fırat Üniversitesi
   ☐Muğla Sıtkı Koçman Üniversitesi

İngilizce öğrenimine yönelik dijital bir oyunun…

5. Kullanıcı arayüzü nasıl olmalıdır? (Birden fazla seçebilirsiniz)
   ☐Sade
   ☐Detaylı
   ☐Kullanıcı dostu

6. Platformu ne olmalıdır? (Birden fazla seçebilirsiniz)
   ☐Bilgisayar
   ☐Mobil (telefon ve tablet)
   ☐Konsol

7. Görsel boyutu nasıl olmalıdır?
   ☐3D
   ☐2D

8. Mekanı nasıl olmalıdır?
   ☐Otantik (Günümüz/gerçekçi)
   ☐Fantastik

9. Türü ne olmalıdır? (Birden fazla seçebilirsiniz?)
   ☐Strateji ☐Yarış/Hız
   ☐Bulmaca ☐Nişan/Avcı
   ☐Aksiyon/Macera ☐Dövüş
   ☐Fantezi/Rol-yapma ☐Sınav/Bilgi
   ☐Spor ☐Simülasyon
   ☐ Klasik Masa Oyunları

1

10. Karakter dizaynı nasıl olmalıdır?
☐Oyuncu karakteri tasarlayabilmeli
☐Karakter önceden tasarlanmış olmalı
☐Karakter önceden tasarlanmış olmalı ancak karakter tasarımında oyun içerisinde oyuncu tarafından değişiklikler yapılabilmeli (kostüm, saç, vb.)

11. Açık dünya oyunu olmalı mıdır? (Açık dünya oyunu; oyuncunun oyun dünyasında serbestçe dolaşabilmesi)
☐Evet
☐Hayır

12. Senaryosu nasıl olmalıdır?
☐Otantik (Günümüz/Gerçekçi)
☐Fantastik
☐Oyunda senaryo olmamalı

13. Oyuncunun aldığı kararlar senaryoyu etkilemeli midir?
☐Evet
☐Hayır
☐Oyunda senaryo olmamalı

14. Modu nasıl olmalıdır
☐Online
☐Offline
☐İki mod da bulunmalı

15. Oyuncu ilişkileri nasıl olmalıdır? (Birden fazla seçebilirsiniz)
☐Rekabetçi ☐Bireysel
☐İşbirlikçi ☐Online oyun olmamalı

16. Oyun içi diyalog türleri neler olmalıdır?
☐Oyuncu olmayan karakter(NPC)-Oyuncu olmayan karakter(NPC) (Oyun hakkında yorum yapmak)
☐Oyuncu-Oyuncu olmayan karakter (NPC) (Oyunculara görev vermesi, oyun hakkında bilgilendirmek)
☐Oyuncu-Oyuncu (Online oyunlarda)
☐Diyalog olmamalı

17. Oyuncular arası iletişim yolları neler olmalıdır?
☐Sözlü
☐Yazılı
☐Hem sözlü hem yazılı
☐İletişim olmamalı

18. Görev (mission/challenge) zorlukları nasıl olmalıdır?
☐Oyuncunun dil yeterliliğine göre kendini adapte eden görevler olmalı
☐Oyuncunun dil yeterliliğinden bağımsız önceden belirlenmiş zorluk düzeyleri olan görevler olmalı

19. Eğitsel içeriğinin düzeyi nasıl olmalıdır?
☐Eğitsel içeriğin düzeyi oyuncunun bilgi düzeyine göre kendini adapte etmeli
☐Eğitsel içeriğin düzeyi oyuncunun bilgi düzeyinden bağımsız ve önceden belirlenmiş olmalı

20. Verdiği eğitsel bilgiler nasıl olmalıdır?
☐Bilgi örtülü bir şekilde verilmelidir (bilgi direkt verilmez, yapılan aksiyonlardan ve ortamdan edinilir)
☐Bilgi açık bir şekilde verilmeli (bilgi direkt aktarılır)

21. Dilsel hatalara geri dönütleri nasıl olmalıdır?
☐Oyun oyuncunun hatasını düzeltmeli
☐Oyun oyuncunun hatasını oyuncuya düzeltmeli

22. Öğrenme aktiviteleri oyuncunun öğrenme stiline göre değişmeli midir?
☐Evet
☐Hayır

23. Ders içerikleri ne tür yöntemler ile sunulmalıdır? (Birden fazla seçebilirsiniz)
☐Dilsel
☐İşitsel
☐Jest ve mimiksel (oyun karakterlerinde)
☐Mekansal
☐Görsel
☐Hepsi

24. Dilsel, işitsel, jest ve mimiksel, mekansal ve görsel yöntemler nasıl kullanılmalıdır?
☐Ayna anda tek bir yöntem türü kullanılmalı
☐Ayna anda birden fazla yöntem türü kullanılmalı

25. Konu tekrarları nasıl olmalıdır?
☐Aynı (aynı içerik sürekli aynı şekilde tekrarlanır)
☐Farklı (aynı içerik tekrar edildiğinde farklı bir şekilde tekrarlanır)

26. Değerlendirme aktiviteleri neye odaklanmalıdır?
☐Oyuncunun ezberine ve anlamasına dayalı olmalı
☐Oyuncunun bilgi kullanımına ve bilgiyi değerlendirmesine dayalı olmalı

27. Değerlendirmelerin sıklıkları nasıl olmalıdır?
☐Sürekli değerlendirme yapılmalı
☐Sadece oyun/bölüm sonunda değerlendirme yapılmalı
☐Değerlendirmeler hem sürekli hem de bölüm/oyun sonunda yapılmalı
☐Oyunda değerlendirme olmamalı

28. Hangi dil becerisi/becerileri hedeflenmeli? (Birden fazla seçebilirsiniz)
☐Dinleme
☐Yazma
☐Okuma
☐Konuşma
☐Hepsi birlikte

29. Öğretim nasıl olmalıdır?
☐Dil yapıları odaklı
☐Anlam odaklı

Hazırlık Eğitiminde Dijital Oyun Tabanlı Dil Öğretimi İçin Dijital Oyun Elementlerine Yönelik İhtiyaç Analizi (Öğretim Elemanı Anketi)

1. Dijital oyun oynarım (mobil, bilgisayar, konsol oyunları).
   ☐Evet
   ☐Hayır

2. Cinsiyetiniz nedir?
   ☐Kadın
   ☐Erkek

3. Kaç yaşındasınız?
   ☐20-24
   ☐25-29
   ☐30-34
   ☐35-39
   ☐40-44
   ☐45-49
   ☐50'den büyük

4. Hangi okulda eğitim vermektesiniz?
   ☐Süleyman Demirel Üniversitesi
   ☐Mardin Artuklu Üniversitesi
   ☐Ankara Hacı Bayram Veli Üniversitesi
   ☐Fırat Üniversitesi
   ☐Muğla Sıtkı Koçman Üniversitesi

İngilizce öğrenimine yönelik dijital bir oyun için…

5. Kullanıcı arayüzü nasıl olmalıdır? (Birden fazla seçebilirsiniz)
   ☐Sade
   ☐Detaylı
   ☐Kullanıcı dostu

6. Nasıl bir öğretim kaynağı olmalıdır?
   ☐Öğretimin ana kaynağı olmalı
   ☐Bütünleyici bir kaynak olmalı
   ☐Ekstra bir kaynak olmalı

7. Ne tür öğrenci bilgileri öğretmenler tarafından takip edilebilmeli? (Birden fazla seçebilirsiniz)
   ☐Öğrencilerin oyunda geçirdikleri toplam süre
   ☐Öğrencilerin yaptıkları hatalar
   ☐Öğrencilerin ilerleme düzeyleri
   ☐Öğrencilerin oyun içi iletişim düzeyleri
   ☐Diğer (Açıklayınız)
   _____

1

8. Öğretmenin rolü ne olmalıdır? (Birden fazla seçebilirsiniz)

☐Tasarımcı (Oyunu tasarlamak, geliştirmek)

☐Oyuncu (Öğrenciler ile birlikte oyunda oyuncu olmak)

☐Kolaylaştırıcı (Oyun içerisinde öğrencilere soru yöneltmek, etkinlikleri ayarlamak ve geri bildirim vermek)

☐Motive edici (Öğrencileri oyun içi ödülleri kullanarak motive etmek ve ödüllendirmek)

☐Değerlendirmeci (Oyunda edinilen ve öğrenilen bilgiyi değerlendirmek için çeşitli değerlendirme ögeleri kullanmak)

9. Öğretmen oyunda eğitsel içeriklere (işlenecek olan konular vb.) müdahale edebilmeli midir?

Evet

Hayır

10. Öğretmen oyunda eğitsel aktivitelere müdahale edebilmeli midir?

Evet

Hayır

11. Platformu ne olmalıdır? (Birden fazla seçebilirsiniz)

☐Bilgisayar

☐Mobil (telefon ve tablet)

☐Konsol

12. Nasıl bir oyun olmalıdır? (Birden fazla seçebilirsiniz)

☐Sınıf içi kullanıma uygun olmalı

☐Sınıf dışı kullanıma uygun olmalı

13. Oyunun içeriği nasıl olmalı? (Birden fazla seçebilirsiniz?

☐ Okuldaki müfredata uygun olmalı

☐ Okuldaki müfredat haricinde olan günlük içerikler olmalı

14. Aktiviteler nasıl olmalıdır? (Birden fazla seçebilirsiniz?)

☐Bireysel aktiviteler

☐Grup aktiviteleri