HACETTEPE ÜNİVERSİTESİ
EĞİTİM BİLİMLERİ ENSTİTÜSÜ

Department of Foreign Language Education

English Language Teaching Program

THE EFFECT OF DIGITAL GAMIFICATION ON YOUNG EFL LEARNERS' VOCABULARY LEARNING

Dilay ÜLKER

Master's Thesis

Ankara, 2024

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DİJİTAL OYUNLAŞTIRMANIN İNGİLİZCEYİ YABANCI DİL OLARAK ÖĞRENEN ÇOCUKLARIN KELİME ÖĞRENİMİNE ETKİSİ

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Master's Thesis

Ankara, 2024

Acceptance and Approval

To the Graduate School of Educational Sciences,

This thesis, prepared by **Dilay ÜLKER** and entitled “The Effect of Digital Gamification on Young EFL Learners’ Vocabulary Learning” has been approved as a thesis for the Degree of **Master** in the **Program of English Language Teaching** in the **Department of Foreign Language Education** by the members of the Examining Committee.

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This is to certify that this thesis has been approved by the aforementioned examining committee members on 22/11/2024 in accordance with the relevant articles of the Rules and Regulations of Hacettepe University Graduate School of Educational Sciences, and was accepted as a **Master’s Thesis** in the **Program of English Language Teaching** by the Board of Directors of the Graduate School of Educational Sciences from ...../...../.....

Prof. Dr. İsmail Hakkı MİRİCİ

Director of Graduate School of Educational Sciences

Abstract

In recent years, the integration of digital gamification into English as a Foreign Language (EFL) settings has become a major area of research due to the developments in educational technology. Although a number of studies have been carried out on digital gamification, its use in young EFL learner contexts is still a growing area of research that needs further contribution. Therefore, this study aims to contribute to this area by investigating the effect of digital gamification on young EFL learners' vocabulary learning with 142 participants who were assigned to an experimental group and a control group in a primary school in Türkiye. Employing a mixed methods research design, this study collected quantitative data through a vocabulary test to assess learning and retention and qualitative data through a semi-structured interview to explore young learners' opinions and attitudes towards digitally gamified vocabulary learning, both of which were developed by the researcher and piloted in another primary school. In this six-month study, the experimental group used digitally gamified activities to learn vocabulary while the control group used their printed and non-gamified versions. The post- and delayed post-test results revealed that the experimental group significantly outperformed the control group, making higher gains in terms of learning and retention. Furthermore, the interview results indicated that learners had positive attitudes towards digitally gamified vocabulary learning and had enhanced levels of motivation and engagement. The results have important implications for teachers, learners, researchers, and material developers regarding how gamification can be implemented in vocabulary learning.

Keywords: digital gamification, teaching English to young learners, vocabulary learning, vocabulary retention, motivation

Öz

Son yıllarda, eğitim teknolojilerindeki gelişmeler sebebiyle dijital oyunlaştırmanın Yabancı Dil Olarak İngilizce (EFL) ortamlarına entegre edilmesi önemli bir araştırma alanı haline gelmiştir. Dijital oyunlaştırma üzerine bir dizi çalışma yürütülmüş olsa da, onun İngilizceyi yabancı dil olarak öğrenen çocuklar bağlamındaki kullanımı daha fazla katkı gerektiren, hala büyümekte olan bir araştırma alanıdır. Bu sebeple, bu çalışma bu alana dijital oyunlaştırmanın İngilizceyi yabancı dil olarak öğrenen çocukların kelime öğrenimine etkisini Türkiye' de bir ilkokulda deney ve kontrol grubuna atanan 142 katılımcıyla inceleyerek katkıda bulunmayı amaçlamaktadır. Karma yöntemler araştırma deseni kullanarak bu çalışma, her ikisi de araştırmacı tarafından geliştirilen ve başka bir ilkokulda pilot çalışması yapılan, öğrenmeyi ve kalıcılığı değerlendirmeyi amaçlayan bir kelime testiyle nicel veri ve çocukların dijital olarak oyunlaştırılmış kelime öğrenimine ilişkin görüşlerini ve tutumlarını keşfetmeyi amaçlayan yarı yapılandırılmış bir görüşme formuyla nitel veri toplamıştır. Altı aylık bu çalışmada, deney grubu kelime öğrenmek için dijital olarak oyunlaştırılmış aktiviteleri kullanırken kontrol grubu bunların basılı ve oyunlaştırılmamış versiyonlarını kullanmıştır. Son test ve gecikmeli son test sonuçları, deney grubunun kontrol grubundan anlamlı bir şekilde daha iyi performans gösterdiğini ve öğrenme ve kalıcılık anlamında daha yüksek kazanımlar elde ettiğini ortaya koymuştur. Ayrıca, görüşme sonuçları öğrencilerin dijital olarak oyunlaştırılmış kelime öğrenimine ilişkin olumlu tutumlarının olduğunu ve artmış motivasyon ve katılım seviyelerine sahip olduklarını göstermiştir. Sonuçlar, öğretmenler, öğrenciler, araştırmacılar ve materyal geliştiricileri için oyunlaştırmanın kelime öğreniminde nasıl uygulanabileceğine ilişkin önemli çıkarımlar sağlamaktadır.

Anahtar sözcükler: dijital oyunlaştırma, çocuklara İngilizce öğretimi, kelime öğrenimi, kelime kalıcılığı, motivasyon

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To my mother Nuran ÜLKER...

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Symbols and Abbreviations

AI: Artificial Intelligence

CALL: Computer Assisted Language Learning

CEFR: Common European Framework of Reference for Languages

DGBLL: Digital Game-Based Language Learning

EFL: English as a Foreign Language

IMI: Intrinsic Motivation Inventory

L1: First Language

L2: Foreign/Second Language

MALL: Mobile Assisted Language Learning

MI: Multiple Intelligences

MKO(s): More Knowledgeable Other(s)

SCT: Sociocultural Theory

SDT: Self-Determination Theory

TELL: Technology Enhanced Language Learning

TEYL: Teaching English to Young Learners

YL(s): Young Learner(s)

ZPD: Zone of Proximal Development

Chapter 1

Introduction

Since the English language has become the lingua franca, namely a language used as a means of communication between groups of people with different native languages, the teaching and learning of English has been strongly encouraged: in order to communicate effectively with people from different countries, operate successfully within a target-language community, have increased chances of getting a job in various competitive fields, and become global citizens, it has become a must for people to be equipped with one or ideally more foreign languages (Ersöz, 2007; Harmer, 2007). Apart from being an international language, English is a foreign language in most countries including Türkiye. Since English is not generally used in national or social life in these countries, the only way that most English as a Foreign Language (EFL) learners are exposed to the language is through formal education in schools (Broughton et al., 2003). As a result, it is important to provide learners who study English as a foreign language with effective learning experiences with regard to language skills and components.

One major subject that has dominated the field of English language teaching and learning for many years concerns the role of vocabulary in learning a language (Richards & Rodgers, 2001), which can be attributed to the fact that vocabulary size plays a vital role in the development of other language skills (Seashore, 1948) and that it is a key element to learn a foreign language (Bakhsh, 2016). Vocabulary learning can improve learners' listening, speaking, reading, and writing skills, and enhance their receptive and productive competence (Gorjian et al., 2011). Wilkins (1972) further emphasized the importance of vocabulary learning with his famous quote: "Without grammar very little can be conveyed, without vocabulary nothing can be conveyed." (p. 111).

Given the role of vocabulary in overall L2 learning and the fact that the brain capacity for implicit learning of vocabulary items and collocations gradually decreases with age (Granena & Long, 2013), it is of vital importance to provide learners in early grades with

effective vocabulary learning experiences since it is “the best time to develop vocabulary” as a result of the processes that the brain undergoes during this period (Garden, 2022, p. 81). Therefore, it is essential to create ample opportunity for young learners to engage in vocabulary learning. Since “a *sine qua non* of successful learning is motivation” (Prensky, 2003, p. 1), young learners also need to be provided with activities that motivate them to learn vocabulary. According to Prensky (2001), much of the traditional L2 content is not motivating to young learners, who are *Digital Natives* born into the digital world. Today’s young learners are fundamentally different from those of the past in that digital technology is an integral part of their lives (Prensky, 2001). Therefore, integrating digital technology into the vocabulary teaching and learning process is highly encouraged to improve young learners’ vocabulary.

Over the past decades, the rapid advances in educational technology have significantly transformed vocabulary learning in young EFL learner classes. As a result, researchers have sought effective ways of implementing interactive methods of instruction such as Computer Assisted Language Learning (CALL), Mobile Assisted Language Learning (MALL), Technology Enhanced Language Learning (TELL), Digital Game-Based Language Learning (DGBLL), and Intelligent Computer Assisted Language Learning (ICALL) in EFL contexts to enhance young learners’ vocabulary learning. In this regard, it has been reported that the integration of digital technology in EFL contexts can not only engage learners’ interest but also enhance their vocabulary learning and long-term retention by providing them with more verbal and multimedia exposure to L2 input (Hao et al., 2021).

As a result of the latest developments in digital technology, there has been a renewed interest in the integration of digital gamification in EFL contexts to enrich learners’ language skills. As a method that applies “game design elements in non-game contexts” (Deterding et al., 2011, p. 2) with online tools in digital settings instead of traditional ones (He et al., 2023), digital gamification enables learners of all ages (i.e., from very young learners to adults), educational levels (i.e., from early childhood education to tertiary

education), and proficiency levels (i.e., from CEFR [Council of Europe (CoE), 2001] A1 to C2) to learn language skills (i.e., listening, speaking, reading, and writing) and components (e.g., vocabulary, grammar, and pronunciation) and increase their academic performance, motivation, and engagement (Qiao et al., 2022; Sailer et al., 2017) through a variety of gamified learning activities. The benefits of digital gamification are to be realized in educational settings, especially in language teaching and learning classes. Digital gamification is very widely accepted by young learners, and as Prensky (2003, pp. 1, 3) stated, they perceive digital games as the "very best teachers" since the games provide the best opportunities to engage them in meaningful learning. As a result, it is important to investigate whether the use of digital gamification in young EFL learners' vocabulary classes is effective in promoting vocabulary learning, and if so, implement it in meaningful ways to assist learners in their vocabulary learning process.

With these in mind, this chapter is dedicated to provide an introduction to the background information for the study, establish the problem leading to the study, position the study within the larger body of the scholarly research in the field, identify the aim and significance of the study, list the research questions, and provide assumptions, limitations, and definitions regarding the study.

Statement of the Problem

In the rapidly changing digital era, keeping up with the fast-paced technology has become one of the key priorities for foreign and second language teachers to provide learners with effective and meaningful learning experiences. However, many schools still prescribe traditional educational activities that are not intrinsically interesting for learners (Ryan & Deci, 2000a), and many teachers still have a tendency towards controlling learners' behavior instead of supporting their autonomy with innovative methods (Deci & Ryan, 1985). While these innovative methods such as gamified learning and Artificial Intelligence (AI) adaptive gamification can foster learner autonomy, engagement, motivation, and

knowledge retention by creating an enjoyable and immersive learning environment, traditional methods might fail to keep learners interested and satisfy their individual needs (Busuu, 2023b). Furthermore, while educational technologies including gamification can foster motivation and engagement, many of the current policies and practices still use traditional methods in educational contexts and therefore are far from satisfying the basic psychological needs of students and teachers for autonomy, competence, and relatedness; which hinders their intrinsic motivation, well-internalized forms of extrinsic motivation, and well-being (Ryan & Deci, 2020). Taking into consideration the major role of vocabulary in overall L2 development, learners need to be provided with fun and interactive vocabulary learning methods such as digital gamification to have higher levels of L2 achievement, motivation, and retention instead of traditional paper-based, non-gamified, or non-digitally gamified activities.

These inevitably pose a question concerning the actual use of gamification in schools to enhance vocabulary learning and retention. According to Blume (2020), however, there is a general lack of use of gamified learning methods and activities especially in countries other than the United States of America, and most teachers have little or no experience with the use of digital games and tools in the classroom for teaching and learning purposes. This can be attributed to the fact that some teachers are *Digital Immigrants* who learned to use technology later in life, and that they are not prepared to teach digital and technological content (Prensky, 2001, p. 4). However, young learners usually get bored and distracted easily if traditional vocabulary teaching methods and techniques are used in the classroom (Bakhsh, 2016). Since teaching and learning go hand in hand and the quality of teaching impacts the quality of learning (Ebel & Frisbie, 1991), it is important for teachers to tailor content to young learners' needs to maximize their vocabulary learning. In this regard, Bakhsh (2016) suggests that engaging and motivating methods such as games should be used especially when teaching vocabulary to young learners. Although a number of studies have been carried out on gamification and its effect on learner achievement and

motivation, there is a need to extend the topic by investigating the whether digital gamification is effective in enhancing young learners' vocabulary learning in an EFL setting.

Aim and Significance of the Study

With the ubiquity of educational technology, the role of digital gamification in teaching and learning language skills has become a growing area of interest within the field of foreign language education. According to Prensky (2003), digital games can provide young learners, who are also *digital natives* who have grown up surrounded by digital technology, with the best opportunity to engage in real learning. Although young learners learn vocabulary effectively through interesting and engaging methods such as games (Bakhsh, 2016), most of the educational activities in schools are still not intrinsically motivating (Ryan & Deci, 2000a). As a result, the way vocabulary is taught and learned needs to be changed to adapt to young learners' specific characteristics, needs, and interests. However, the actual implementation of gamification in young learner classes is rather limited. Furthermore, young learners have remained rather underrepresented in the related literature over the past two decades: a large majority of literature on gamified L2 learning has centered on adolescents and adult learners, with young learners being the least explored group (Acquah & Katz, 2020; Dehghanzadeh et al., 2019; Dehganzadeh & Dehganzadeh, 2020) and there is a need for further contribution regarding its effect on young learners' vocabulary learning in the related literature. With these in mind, the main aim of this study is to investigate whether the use of digital gamification in EFL classes has an effect on young learners' vocabulary learning. The secondary aims are to investigate whether it has an effect on young learners' vocabulary retention and whether young learners have positive attitudes towards the use of digital gamification in their EFL classes in the process of vocabulary learning. It is expected that this study will have strong implications for educators, learners, researchers, and material developers in terms of how gamification can be integrated in EFL contexts in a way that enhances vocabulary learning.

Research Questions

As mentioned above, the main purpose of this study is to investigate whether digital gamification has an effect on young EFL learners' vocabulary learning. Another purpose of this study is to determine whether digital gamification has an effect on the extent to which young EFL learners retain vocabulary. Moreover, this study aims to explore the attitudes of young EFL learners towards learning vocabulary through the use of digital gamification. With these in mind, this research seeks to address the following questions:

1. What is the effect of digital gamification on young EFL learners' vocabulary learning?

1.1. Is there a significant difference between the pre-test scores of the experimental group and the control group?

1.2. Is there a significant difference between the post-test scores of the experimental group and the control group?

1.3. Is there a significant difference between the pre-test and post-test scores of the experimental group?

1.4. Is there a significant difference between the pre-test and post-test scores of the control group?

2. What is the effect of digital gamification on young EFL learners' vocabulary retention?

2.1. Is there a significant difference between the delayed post-test scores of the experimental group and the control group?

2.2. Is there a significant difference between the post-test and delayed post-test scores of the experimental group?

2.3. Is there a significant difference between the post-test and delayed post-test scores of the control group?

3. What are young EFL learners' opinions and attitudes towards using digital gamification in learning vocabulary?

3.1. What are young EFL learners' attitudes towards using digital gamification in learning vocabulary with regard to gamification elements?

3.2. What are young EFL learners' attitudes towards using digital gamification in learning vocabulary with regard to intrinsic motivation?

3.3. What are young EFL learners' attitudes towards using digital gamification in learning vocabulary with regard to the flow state?

3.4. What are young EFL learners' attitudes towards using digital gamification in learning vocabulary with regard to individual learning versus collaborative learning?

3.5. What are young EFL learners' attitudes towards digitally gamified vocabulary learning as compared to non-digitally gamified traditional vocabulary learning?

3.6. What are young EFL learners' attitudes towards digitally gamified vocabulary retention as compared to non-digitally gamified traditional vocabulary retention?

Assumptions

There are certain assumptions regarding this study. First of all, it is assumed that the learners to be assigned to the experimental group or control group are similar and thus the results of the groups are comparable. Another assumption is that the sample is representative of the population and that the results are generalizable beyond the study. It is also assumed that the learners in the experimental and control group will not be exposed to the target L2 vocabulary outside the classroom, that the only difference between the groups will be the implementation, and that all other conditions will remain the same. The

researcher also assumes that the teacher will have the essential technology skills to be able to implement digital gamification activities effectively after the interactive training sessions provided by the researcher. In regard to the implementation of the activities in the classroom, it is assumed that there will not be any kind of breakdown, unstable internet connection, technical problems with the smartboard, or power outage. Another assumption is that the participants will answer all the questions in the data collection instruments honestly. Finally, it is assumed that the digital gamification tools implemented in the study and data collection instruments developed by the researcher will be in alignment with the purpose of the research.

Limitations

Several potential limitations to this study need to be acknowledged. First, the study used convenience sampling, which is a non-probability sampling method that involves selecting participants to be included in the study primarily based on their convenience, availability, and ease of access. Since each unit in the target population does not have an equal chance of being included in the sample in convenience sampling, it might lead to sampling bias. Therefore, the sample might not be representative enough of the target population, and the findings might not be generalizable to broader contexts, people, and times, which might threaten the external validity of the study.

Another limitation of this study is that it was not possible to randomly assign individuals to the experimental group or control group as they were in pre-existing classes. As a result, instead of the true experimental design, the study used the quasi-experimental design using nonrandomized assignment of participants to the groups. Since individual random assignment was not possible, the researcher used cluster random assignment, randomly assigning the classes to the conditions.

Finally, the time interval between the post-test and delayed post-test, which was six weeks, was relatively short in this study due to time constraints. As a result, the study might

not have been able to thoroughly assess the effect of digital gamification on long-term vocabulary retention. A longer interval could have led to a more precise assessment of vocabulary retention in the long term.

Definitions

(Digital) Gamification

While a variety of definitions of the term “gamification” have been provided, this thesis will use the definition suggested by Sailer et al. (2017, p. 371) who defined it as “the implementation of game-design elements in real-world contexts for non-gaming purposes” to foster learner performance, motivation, and engagement. Digital gamification, on the other hand, refers to the use of “online tools or platforms instead of traditional ones” (He et al., 2023, p. 183) in the process of gamification. Although the term gamification is used in its broadest sense to refer to digital gamification as well as non-digital gamification, the term “digital gamification” is used throughout this thesis since all of the gamification tools used in this study are digital. Digitally gamified learning or instruction, therefore, refers to the use of digital gamification in the learning or teaching process, respectively.

Young EFL Learners

Young learners refer to “children of pre-primary and primary school age” (Richards & Schmidt, 2013, p. 643), from around five years of age to twelve (Cameron, 2001). Young EFL learners, therefore, can be defined as learners within this age group who learn English as a foreign language in countries where it is not the primary language.

Traditional Learning

Throughout this thesis, the term traditional learning will be used to refer to non-digital, non-gamified, and non-digitally gamified vocabulary learning with conventional tools and methods. In other words, the participants in the traditional vocabulary learning group will participate in comparable instruction without receiving any kind of digital, gamified, or

digitally gamified vocabulary instruction while the digital gamification group will receive digitally gamified vocabulary instruction.

Vocabulary

Vocabulary throughout this thesis refers to “a set of lexemes, including single words, compound words, and idioms” (Richards & Schmidt, 2013, p. 629) “for a particular language or . . . [those] that individual speakers of a language might use” (Hatch & Brown, 1995, p. 1).

Vocabulary Learning

Learning in general refers to “the process of acquiring new information” (Squire, 1987, p. 3). In the context of language education, vocabulary learning refers to “the development of words, their meanings, and the links between them” (Cameron, 2001, p. 18) through the process of encountering a new word, getting its form, getting its meaning, consolidating the form and meaning in memory, and finally using the word (Hatch and Brown, 1995, p. 374).

Vocabulary Retention

As a consequence of learning, retention in this thesis will refer to “the persistence of learning in a state that can be revealed at a later time” (Squire, 1987, p. 3) and as “having the learned information stored in long-term memory in such a way that it can be readily retrieved in response to standard prompts”, where prompts can refer to stimuli given by teachers in an educational context (Bennett & Rebello, 2012, p. 2856). In other words, it refers to the process in which information is transferred from short-term memory to long-term memory and retrieved when appropriate (Bennett & Rebello, 2012, p. 2856). In language teaching, vocabulary retention refers to learners’ ability to recall or remember vocabulary after an interval of time (Richards & Schmidt, 2013, p. 498). In this study, therefore, the term vocabulary retention will refer to learners’ ability to remember, recall, and retrieve a collection of words from long-term memory when needed.

Motivation

Motivation, in general, was defined by Simpson and Balsam (2015, p.3) as “the energizing of behavior in pursuit of a goal [and] a fundamental property of all deliberative behaviors”. Deci and Ryan (1985) proposed that there are two main types of motivation: *intrinsic motivation* and *extrinsic motivation*. They later defined intrinsic motivation as “doing something because it is inherently interesting or enjoyable” and extrinsic motivation as “doing something because it leads to a separable outcome.” (Ryan and Deci, 2000a, p. 55). In the context of foreign and/or second language education, more specifically, Gardner and MacIntyre (1991, p. 58) stated that motivation refers to “the directed, reinforcing effort to learn the language”, and this definition will be used in this thesis.

Chapter 2

Theoretical Basis of Research and Literature Review

This chapter will provide a theoretical framework for establishing the importance of conducting the study and a review of the scholarly literature to present the results of prior studies on the use of gamification in EFL contexts and determine how the current study relates to the larger body of literature on this topic. Furthermore, this chapter will suggest why more research is needed on this topic and advance how the study will contribute to the growing body of research by filling this need and extending previous studies.

Vocabulary Learning

Over the past century, the issue of how to learn and teach vocabulary more effectively has been the subject of intense debate and discussion within the field of second or foreign language teaching and learning. Vocabulary is an essential part of conveying ideas, thoughts, and concepts in a foreign language, and as Wilkins (1972) stated, “nothing can be conveyed” without it (p. 111). Vocabulary development, therefore, is one of the crucial components of foreign language teaching and learning (Ramezanali & Faez, 2019). Some of the principal areas of interest in the field of EFL include the role of vocabulary in language teaching and learning, the role of teachers and learners in this process, the nature of learner-teacher and learner-learner interaction, the role of learners’ native language, the development of curricula, syllabi, teaching programs, instructional materials, and activities, the implementation of learning theories, productive and receptive skills, learning and retention, the role of motivation in learning, the feelings of learners, the role of technology in learning, the assessment and evaluation of learner achievement, and the ways to provide effective feedback in this process (Larsen-Freeman & Anderson, 2011; Richards & Rodgers, 2001). As a result, theorists and researchers have sought to address such areas and find solutions to vocabulary teaching and learning problems by developing a variety of approaches, methods, and techniques.

Recent developments in computerized datasets of words (i.e., corpora) and lexical approaches that emphasize the central role of vocabulary in language learning have led to a revival of interest in teaching and learning vocabulary (Richards & Rodgers, 2014; Thornbury, 2002). While traditional approaches to teaching and learning languages such as Audiolingualism focused on habit formation by means of the repetition and reinforcement of grammatical structures and used “only enough vocabulary to make such drills possible” (Hockett, 1959, cited in Richards & Rodgers, 2001, p. 52), later approaches such as the Lexical Approach suggested that the building blocks of language learning are not grammar, functions, or notions, but lexis and multi-word lexical units (Lewis, 1993; Richards & Rodgers, 2014). More recent approaches such as Communicative Language Teaching (CLT) and Task-Based Language Teaching (TBLT) provide a more contextualized vocabulary teaching and learning experience as they prioritize the meaning dimension of language over form and involve using target vocabulary items in context. This is especially important given the fact that learners need to see how words are used in context in order to learn and retain vocabulary (Harmer, 2009).

Understanding the role of vocabulary in language learning requires first knowing what it means to know a word. According to Nation (2001, p. 27), word knowledge includes three main aspects: form, meaning, and use, each of which have receptive and productive aspects. Knowledge of form refers to the knowledge of a word’s spoken and written form, and the word parts it has; knowledge of meaning includes the knowledge of the word’s form, meaning, concept, referents, and associations; and knowledge of use refers to the knowledge of the word’s grammatical functions, patterns, collocations, and constraints on use (e.g., its register, frequency, style, etc.) (Nation, 2001, p. 27, 292). All these aspects show that words are not isolated units but are parts of a variety of related systems, which explains why knowing a word is multifaceted (Nation, 2022).

According to Nation (2001, p. 6), how much vocabulary learners need to know can be decided by looking at how many words there are in the target language, how many words

native speakers know, and how many words need to be known to use the language. In this regard, Nation (2001, p. 11) identified four types of vocabulary: high-frequency words, academic words, technical words, and low-frequency words. Among these, high-frequency words are of special importance. As Nation (2001) stated, they are “so important that anything that teachers and learners can do to make sure they are learned is worth doing” (p. 16), and therefore, a significant amount of time should be spent on them. According to Nation and Newton (1996), focusing on the words with high frequency yields significant advantages for the effort invested in learning. McCarten (2007) also stated that the vocabulary items to be taught and learned are selected based on their frequency, usefulness in the classroom context, and “learnability” (p. 19). In this regard, corpora, which are collections of written and spoken texts stored in a computer, can be effective tools for learning about the frequency of words and help teachers make choices about which items to teach and in what order (McCarten, 2007).

There are different categories that vocabulary can be divided into. For instance, there is a distinction between receptive vocabulary and productive vocabulary. According to Haycraft (1978, p. 44), receptive vocabulary refers to the words that, when encountered in a listening or reading context, can be recognized and understood by learners while productive vocabulary refers to the words that can be understood, pronounced, and used correctly by learners in speaking and writing. Vocabulary learning can also be divided into intentional and incidental vocabulary learning. While intentional vocabulary learning is the type of learning that is designed for or intended by teachers or learners, incidental vocabulary learning refers to the type of learning that is a byproduct of another activity (Hatch & Brown, 1995, p. 368). In other words, intentional vocabulary learning occurs by deliberately following a plan to improve vocabulary while incidental vocabulary learning occurs by picking up vocabulary without intentional exposure to input (Richards & Schmidt, 2013, p. 276). There is also a distinction between the breadth and depth of vocabulary. Vocabulary breadth refers to the number of words whose meaning a learner knows at least

at a superficial level while vocabulary depth refers to how well a learner knows a word (Marzban & Hadipour, 2012). Therefore, even if a learner's vocabulary breadth includes a wide variety of words, it does not necessarily mean that they have a deep understanding of each. As a result, vocabulary breadth and vocabulary depth complement each other, and therefore, it is important to improve both.

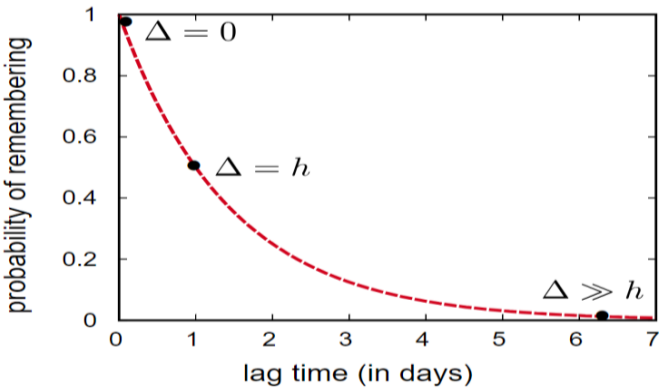
In regard to the issue of how teachers can help learners learn vocabulary, McCarten (2007) suggested that materials should provide learners with a contextualized and enjoyable learning environment in which they can be exposed to frequent vocabulary items that are appropriate to their needs. She further suggested that learners should be taught effective vocabulary learning techniques and strategies that will enhance their learning both in and out of the classroom (McCarten, 2007). With regard to activity types, Harmer (2009) suggested that word maps, games, and dictionaries can provide learners with effective vocabulary learning experiences.

In order to achieve desirable vocabulary learning outcomes, learners need not only to learn a large number of words but also to remember them because "learning is remembering" (Thornbury, 2002, p. 23). In order for successful vocabulary learning to take place, holding words in the short term memory is not enough, and learners need to transfer the words to permanent long-term memory, which can be achieved through repetition over spaced intervals (Thornbury, 2002). In this regard, McCarten (2007) also stated that in order for learning to take place, vocabulary should be repeated often with a variety of activities that are tailored to different learning styles and needs. According to Ebbinghaus (1885), retention is increased through multiple re-learnings or repetitions of the studied material (Nieuwenhuis-Mark, 2012).

According to the forgetting curve (see Figure 1), Δ refers to the "lag time" since the last time a learner practiced, and h refers to "half-time" of the vocabulary item in a learner's long-term memory, which is the time required for a learner's memory strength to decrease by half of its initial value (Ebbinghaus, 1885; Settles & Meeder, 2016; Settles, 2016).

Figure 1

The Forgetting Curve



Note. Ebbinghaus' (1885) Forgetting Curve. Reprinted from Settles, 2016, from *A Trainable Spaced Repetition Model for Language Learning* by B. Settles & B. Meeder, 2016, in *Proceedings of the 54th Annual Meeting of the Association for Computational Linguistics* (p. 1852), August 2016, Association for Computational Linguistics. Copyright 2016 by Association for Computational Linguistics.

As a result, Δ=0 means that a learner just practiced and can recall the item correctly, Δ= h means that the lag time and half-life have the same value, and the learner is at the point of forgetting, and finally, Δ≫ h means that the learner has not practiced the vocabulary item for such a long time that they will probably forget it (Ebbinghaus, 1885; Settles & Meeder, 2016). As a result, it is important for learners not only to repeat what they have learned but also to do it at the most effective intervals to maximize long-term vocabulary retention.

Using Technology in Vocabulary Learning

As technology is integrated into both our lives and educational settings, adapting it to vocabulary teaching and learning has become a major area of interest in EFL research. The shift toward a learner-centered approach to teaching and learning foreign languages has led to a renewed interest in the use of various forms of technology in EFL classrooms to promote learner-initiated learning and learner autonomy (Richards & Rodgers, 2014). In

this regard, Waters (2012) stated that using interactive whiteboards and web-based teaching and learning platforms can promote learner-led interaction and autonomous learning by encouraging them to work independently. As a result of the recent developments in technology, the issue of how such approaches as TELL, CALL, ICALL MALL, and DGBLL can enhance the vocabulary teaching and learning process has gained considerable importance.

As an umbrella term that encompasses a broader spectrum of digital technologies beyond computers and mobile devices, TELL integrates various forms of technology including online learning, blended learning, flipped learning, hybrid learning, and virtual environments (Hasumi & Chiu, 2024). According to Nation (2022), technology supports vocabulary learning by adding the entertainment factor to the learning process, provided that learners are able to repeatedly encounter the right level of vocabulary input through spaced repetition, have focused attention, and that there is a co-occurrence of texts, sounds, and visual aids. In order to maximize vocabulary learning, target vocabulary should be introduced in meaningful contexts and in various forms including audio, pictorial, and textual; which can be achieved through technology and digital applications (Yu & Trainin, 2022). One way of learning vocabulary through entertainment is gaming. According to Nation (2022), games enable learners to gain repetition of vocabulary at reasonable intervals and process the vocabulary better through being exposed to words and the visible actions that they are associated with. Nation (2022) further claims that vocabulary can be learned effectively through gamification because learners need to understand the language used in games in order to achieve success in the game, which, in turn, motivates them to learn the words. Incidental learning is, therefore, largely involved in learning through entertainment as in the case of gaming (Nation, 2022). In an investigation into the incidental language learning of young EFL learners who had not received any formal English instruction at school but received vocabulary input only through technology-based resources including games and computers, Wilde and Eyckmans (2017) measured the

learners' English proficiency through a receptive vocabulary test and a proficiency test, and attitudes towards English through questionnaires. The results indicated that although they did not start formal English instruction, they were able to perform tasks at the A2 level with regard to vocabulary and the four skills, and had overwhelmingly positive attitudes towards English, indicating that different types of media can be important sources of L2 input for learners. Overall, technology-assisted L2 vocabulary learning can enhance vocabulary learning and retention since it provides an effective combination of intentional and incidental learning, incorporates visuals, sounds, and texts, and lowers learners' affective filter (Yu & Trainin, 2022).

Young Learners

Language teaching and learning occurs in a variety of age groups including very young learners, young learners, teenagers, young adults, and adults. In the field of foreign language teaching, various definitions of young learners are found. Nunan (2011), for instance, defined young learners as children "from around three years of age to fifteen" (p. 2). According to a definition provided by Ersöz (2007), young learners refers to children in the first year of primary school (i.e., six to twelve years of age) while very young learners refers to children of pre-school age (i.e., three to six years of age) (p. 5). The reason why the 6-12 age range is used to define young learners is that formal education begins at the age of 6 in many countries and many children begin to go through considerable cognitive and emotional changes at the age of around 12 (Cambridge Assessment English, 2019). Children show significant differences even among themselves. For instance, while young learners aged 10 and 11 like games, puzzles, and songs, those who are 12 and 13 like dialogues, question and answer sessions, and matching activities most (Keskil & Cephe, 2001, p. 61). The reason why there are considerable differences in young learners' abilities, needs, strengths, weaknesses, and characteristics within the 6-12 age range is that they are still going through the stages of cognitive, linguistic, social, emotional, and physical development (Cambridge Assessment English, 2019). Young learners also differ in their

skills and learning abilities in their first language, and tend to have individual differences in language domains in the foreign or second language as well, which is why different children will learn different domains of language from the same lesson (Cameron, 2001). Furthermore, the first language of young learners may enhance or undermine their foreign or second language learning through transfer from L1 (learners' first language) to L2 (a foreign or second language) based on how similar or different the two languages are in terms of cues such as word orders and word endings (MacWhinney, 1987). Moreover, young learners who learn English as a foreign language and as a second language also differ from each other in significant ways. In contrast to learners who learn English as a second language, EFL learners have very little exposure to the target language outside their classroom (Cameron, 2001). Although even very young learners might be exposed to the language through videos, movies, radios, computers, tablets, and television, it is highly likely that they will not be exposed to the language in everyday life as much as those who learn English as a second language (Cameron, 2001). Furthermore, it might not be possible for them to fully develop their language skills if the types of input provided by their teacher are restricted (Cameron, 2001). Therefore, teaching English as a foreign language to young learners necessitates creating a learning environment that is rich in L2 input and exposure. Since there is a significant difference even within the same group (e.g., between what children of six years can achieve and what children of twelve years can achieve), teachers must take into consideration their psychological development, cognitive development, socio-emotional development, and communicative development (Ersöz, 2007).

There is an even greater difference between young learners and adults than there is between young learners and very young learners. Thus, adapting the teaching approaches, methods, strategies, and techniques to young learners' needs and characteristics is of high importance while teaching English to young learners. Although adults usually learn English because they either have intrinsic and integrative motivation (i.e., they find learning English enjoyable and satisfying or they aim to connect with the

people and be a member of the cultural community of the target language) or extrinsic and instrumental motivation (i.e., they aim to earn a reward for learning English such as finding a job, getting promoted, or passing exams) (Deci & Ryan, 1985; Gardner, & MacIntyre, 1991; Noels et al., 2000), young learners often do not have a clear reason for learning English (Cambridge Assessment English, 2019). Therefore, it is important for teachers to arouse their curiosity, help them develop positive attitudes towards learning English, and motivate them in their learning process. Although teaching and learning do not refer to the same activity, learning can be put in the center of the frame of teaching foreign languages to young learners by focusing on the characteristics of the learners and creating an environment that will enhance their opportunities for learning (Cameron, 2001). Young learners' (YLs') teachers further need to understand how YLs perceive the world around them and how they learn, conduct a needs analysis to choose the best learning tasks for them, have the necessary classroom management skills, keep them engaged, use language in a way that facilitates learning, and be knowledgeable about the target language, teaching it to young learners, and language learning (Cameron, 2001).

The Characteristics of Young Learners

Teaching a foreign language to young learners is different from teaching adults or adolescents in many important ways since YLs have characteristics specific to their age group such as their cognitive, social, emotional, and linguistic development. While YLs are typically in pre-school or primary school, adults are well established at school and thus are more experienced (Pinter, 2017). Although YLs are more enthusiastic as compared to older learners, they are less able to maintain interest and motivation when they encounter difficult tasks (Cameron, 2001). Furthermore, YLs have a very short attention span as compared to adults and get bored very quickly if conventional methods and techniques are used in the classroom instead of those involving fun and play (Bakhsh, 2016). In this regard, it is important for foreign language teachers to provide YLs with enjoyable teaching methods such as games during class time to avoid boredom (Bakhsh, 2016). YLs also cannot

analyze language as an abstract system and find it more difficult to use language to talk about language, which is referred to as metalanguage, as compared to adults (Cameron, 2001; Pinter, 2017). Furthermore, YLs have limited reading and writing skills as compared to adults (Pinter, 2017). Another difference between young learners and adults is that YLs are more self-centered and less aware of themselves as language learners, of the learning process, of others, and of the world around them while adults have an elevated level of awareness (Pinter, 2017). Since YLs are not able to pay as much selective and prolonged attention to language tasks as adults, they are more likely to be distracted and diverted very fast and easily by their peers (Bakhsh, 2016; Cameron, 2001). YLs also learn best with imagination, stories, movement, mimics, and gestures while adults are more concerned with real-life issues (Bakhsh, 2016; Pinter, 2017). There are also considerable differences between young learners and adults in terms of working memory and long-term memory. In their study, Forsberg et al. (2022) found that although memory performance decreased as the number of items in a set increased for both young children and young adults, young adults outperformed young children in working memory and long-term memory tasks. Also, they indicated that young children's limited working memory capacity constrained their long-term memory (Forsberg et al., 2022).

Age has long been considered as one of the key factors in determining how successfully learners can learn a foreign or second language. In this regard, Lenneberg (1967) advanced the Critical Period Hypothesis, claiming that there is a critical period (i.e., when an individual reaches puberty) for language acquisition after which it is almost impossible to learn a language like a native speaker, which can be used as a justification for the fact that children and adults usually differ from each other in their proficiency levels in a second language. Thus, children learn languages more quickly and successfully than adults, especially with regard to pronunciation and accent, because of the loss of brain plasticity as well as the devices used in first language acquisition around the age of puberty (Lenneberg, 1967). The reason why YLs tend to get a more native-like accent might also

be attributed to the fact that they are less embarrassed and inhibited than adults when they talk in a new language (Cameron, 2001). In the context of TEYL, therefore, it is of particular importance to provide young learners with effective and meaningful learning experiences to help them master the English language before they reach puberty.

Teaching English to Young Learners

Teaching foreign languages to young learners has a long history: children in primary education have been taught French or English to be used as a medium of instruction in many African and Asian countries for many years (Cameron, 2001). Over the past two decades, Europe and South America has seen a rapid increase in the number of English classes in state schools and private schools (Cameron, 2001). As the world becomes increasingly multilingual and plurilingual, more and more young children start to find themselves in an environment in which people speak more than one language (Ersöz, 2007, p. 5). Thus, teaching English to young learners has expanded enormously in the last two decades (Cameron, 2001).

All learners, including young children, learn languages at different ways and paces. Therefore, in order for the teaching and learning process to be effective, it is necessary for teachers to match their teaching style with the learning styles of learners, which can be achieved by using a wide variety of activities and materials (Ersöz, 2007). In this regard, the activity types that are suitable for YLs include games, chants, songs, competitions, information gap, opinion gap, storytelling, guessing, puppets, arts and crafts, all of which are highly motivating, engaging, and fun for this particular age group. In regard to games, Hazar (2020) stated that especially digital ones are highly effective in teaching English to young learners and fostering their motivation.

Motivating learners, which is the main responsibility of teachers, plays a central role in teaching English to young learners, and it can be best enhanced by challenging learners, engaging their attention and interest, and addressing their learning needs, preferences, styles, and intelligence types (Ersöz, 2007). In language learning classrooms, it is typical

that learners differ from one another in what motivates them to learn English, what kind of strategies they use, and what kinds of teaching approaches and tasks they prefer even though they are studying in the same class (Richards & Rodgers, 2014). This difference is referred to as *diversity*, and it implies that "one size does not fill all", as opposed to traditional teacher-centered teaching methods and approaches (Richards & Rodgers, 2014, p. 230).

In recent years, language teaching approaches and theories such as learner autonomy, individualized instruction, learner strategies, and Multiple Intelligences have shifted towards a more learner-centered philosophy, valuing and acknowledging learners' diverse types of learning styles, preferences, abilities, strategies, attitudes, and motivations, and highlighting their role in conducting a needs analysis to identify the most suitable learning approaches, learning objectives, and activities to be accommodated in language teaching (Richards & Rodgers, 2014).

Gardner (2011) stated that just as young children differ from adults, they also differ from one another, and that in some societies, they differ even more within themselves than adults do. He claims that although there is an outlined scheme and all young children pass through similar processes as they learn a language, they still have vast individual differences with regard to the kinds of words that they first utter, the extent to which they imitate what their parents utter, and how rapidly and in what way they learn the basic aspects of language (Gardner, 2011).

Based on the fact that each individual possesses different types of intelligence, Gardner (1993) proposed the Theory of Multiple Intelligences (MI), which claims that there are eight different types of intelligence, each of which has a different way of processing information. These types of intelligence are referred to as *Linguistic Intelligence* (i.e., the ability to use words and language creatively), *Logical-Mathematical Intelligence* (i.e., the ability to think logically and rationally), *Visual-Spatial Intelligence* (i.e., the ability to visualize the world), *Musical Intelligence* (i.e., the ability to discern sounds, tones, and rhythm), *Bodily-Kinesthetic Intelligence* (i.e., the ability to use one's body in coordination with their

mind), *Interpersonal Intelligence* (i.e., the ability to interact well with other people), *Intrapersonal Intelligence* (i.e., the ability to understand one's inner world), *Naturalist Intelligence* (i.e., the ability to explore the environment and living things), and the ninth type, *Existential Intelligence* (i.e., the ability to tackle questions about human existence) (Gardner, 1993, 1999).

In the context of foreign language education, applying the MI approaches can be effective in achieving both motivational and conceptual objectives and overcoming learning problems through addressing the specific needs of the full range of learners (Gardner, 2011). In EFL classrooms, therefore, integrating such methods as games and gamification can appeal to different intelligences by incorporating a variety of tasks such as crossword puzzles for linguistic intelligence, unscrambling jumbled letters for logical-mathematical intelligence, digital flashcards for visual-spatial intelligence, rhyme time challenges for musical intelligence, using movement and QR codes in quizzes for bodily-kinesthetic intelligence, collaborative vocabulary games for interpersonal intelligence, and individual vocabulary games for intrapersonal intelligence. In this way, learners with different types of intelligence can be actively involved in the learning process and thus improve their language skills.

In order for young learners to be able to communicate the way they prefer to learn, they must first be knowledgeable about the different types of intelligence in a simplified way that they can comprehend. In this regard, Armstrong (2018, p. 46) advanced simple terms for eight intelligence types as *Word Smart* (linguistic), *Number Smart* or *Logic Smart* (logical-mathematical), *Picture Smart* (spatial), *Music Smart* (musical), *Body Smart* (bodily-kinesthetic), *People Smart* (interpersonal), *Self Smart* (intrapersonal), and *Nature Smart* (naturalist), and provided an illustration of these terms to introduce MI theory to young learners to enable them to assess their abilities in each type of intelligence.

It is proposed that each learner has their own MI profile, which encompasses the combinations of various intelligence types where some of them are more developed than

others, which needs to be identified to provide the learner with a specific learning approach that best fits their abilities and needs (Gardner, 2011; Richards, Rodgers, 2014). Although the most relevant type of intelligence in terms of language learning is Linguistic Intelligence, it is also intertwined with other types of intelligence such as Musical Intelligence, Bodily-Kinesthetic Intelligence, and Interpersonal Intelligence, and all types of intelligence enrich each other (Gardner, 2011, Richards & Rodgers, 2014). In this regard, gamification can be an effective approach in the EFL context because it not only exposes learners to a vast amount of comprehensible input but also integrates various activities involving different aspects of MI such as music, rhythm, visuals, rules, goals, movement, interaction, collaboration, and healthy competition in the learning process. Furthermore, the most effective way of assessment for young children is to involve them in engaging and motivating activities such as games, which can then be used to identify their intellectual profile and choose the approaches to teaching and learning accordingly (Gardner, 2011). As a result, it is highly important for foreign language teachers to conduct a needs analysis and acknowledge each learner's MI profile, and provide a suitable approach that contains activities related to the various types of intelligence. Since there are multiple intelligences, a one-size-fits-all approach to education is not effective in most cases. In order to address the diverse needs of each individual, gamification platforms that use AI can enhance learners' language skills, motivation, and engagement by adapting to their learning behavior, determining their strengths and weaknesses, providing them with personalized tasks and guidance (Marsden, 2023).

Within the field of teaching English as a foreign language, the language used in an EFL classroom has been the subject of intense debate. In mainstream methods, the use of L1 is strongly discouraged as it hinders L2 learning. In many countries, YLs have the opportunity to be exposed to foreign language input only in their classroom. Therefore, it is highly important for teachers and young learners to speak English all the time, without switching to L1 (Ersöz, 2007). Moreover, the belief that L1 must be used as a mediator for

learners with lower proficiency levels is challenged by the fact that pictures have a positive effect on young learners' vocabulary learning, which means that they enable learners to form a direct association between a word and its meaning without the need for L1 translation (Nation, 2022). In order to make meaning clear, therefore, the teacher can use a lot of demonstrations, visuals, realia, examples, repetition, body language, and facial expressions instead of direct translation.

Theories Behind Teaching English to Young Learners. Teaching English effectively to young learners necessitates first acknowledging the connection between their cognitive, psychological, linguistic, and social development and language learning. Therefore, it is important for YL teachers to know, in a holistic way, what developmental processes they go through, how they learn new concepts, how they perceive the world around them and develop new ideas accordingly, how they learn to interact with their teachers and peers, and how they solve problems they encounter in their learning environment (Cameron, 2001; Pinter, 2017). With these in mind, there are two major theorists in developmental psychology whose theories of development and learning can be adapted to the field of Teaching English to Young Learners and contribute to constructing a theoretical framework for the field with regard to how children as language learners develop and learn: Piaget and Vygotsky.

Piaget's Theory of Cognitive Development. One of the most influential theorists in child psychology and development, Jean Piaget (1963) proposed that young children are active learners and thinkers that construct knowledge by constantly interacting with the world surrounding them, actively making sense of the environment, and solving problems they encounter in this process of active learning, which is referred to as constructivism (Cameron, 2001; Pinter, 2017). According to Piaget (1963), development and learning takes place through the processes of assimilation and accommodation. Assimilation occurs when the child assimilates new information without any change in their schema of existing skills and knowledge while accommodation occurs when the child adjusts or changes their way

of thinking to accommodate new information that does not fit their existing schema (Piaget, 1963). Learning a second or foreign language, thus, takes place through this process of "reorganizing" in which learners adjust their mental schemas to integrate L2 input that contains new information (Cameron, 2001, p.3).

Although all young learners are unique, they go through the same stages of development as their peers in the same order. In this regard, Piaget (1963) claimed that all children go through four universal stages of development, which are classified based on what they are capable of thinking at certain age groups: *the sensorimotor stage* from birth to two years when the child's thinking is reliant on senses and actions, *the preoperational stage* from two to seven years when the child's thinking is reliant on perception, *the concrete operational stage* from seven to eleven years when the child's thinking is reliant on logical thinking, and *formal operational stage* from eleven years and older when the child's thinking is reliant on formal logic. In other words, although they are all referred to as children, younger and older children have very different needs, interests, and ways of thinking. In the context of teaching English to young learners, therefore, it is important for teachers that work with various age groups with different characteristics to be knowledgeable about Piaget's stages of development, constantly monitor them, and select appropriate materials and tasks for them accordingly (Pinter, 2017). Another implication of Piaget's theory for language learning is that children are active sense-makers, learners, and thinkers who construct their own knowledge in an environment (i.e., the classroom) that provides opportunities for learning (Cameron, 2001). Therefore, it is important for YL teachers to provide learners with a classroom atmosphere that supports their learning through learner-centered activities promoting autonomy, active learning, and engagement.

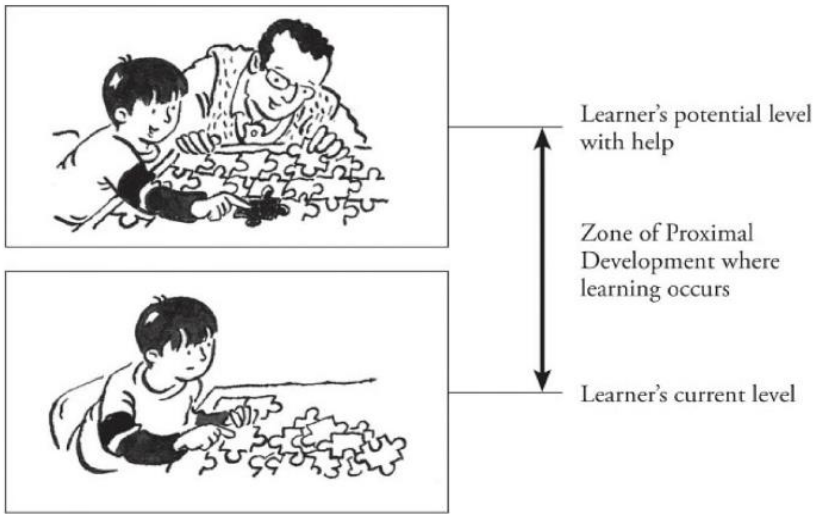
Although Piaget's ideas have strong implications for learning in general and language learning in particular, they focus on the child himself or herself in an environment of objects and neglect the role of social interaction, which is an essential component of children's development and learning (Cameron, 2001). In this regard, Vygotsky (1978)

proposed that social interaction with adults or peers is of vital importance for children to learn and develop, whose theory will be discussed below.

Vygotsky's Sociocultural Theory of Cognitive Development. Unlike Piaget's theory of cognitive development, Vygotsky's (1978) Sociocultural Theory of Cognitive Development focused on the role of social interaction with others, social context, and cultural context in development and learning, while also acknowledging the existence of individual cognitive development. According to Vygotsky (1978), children learn much more with the help of other people than they would on their own. In other words, when assisted by adults or peers, children achieve the tasks that they can nearly but not quite achieve themselves. Vygotsky (1978) proposed the Zone of Proximal Development (ZPD) to refer to this space or difference between what a learner is capable of achieving alone and what they can achieve with the assistance of a *More Knowledgeable Other* (MKO) such as teachers, parents, and more expert peers (see Figure 2).

Figure 2

The Zone of Proximal Development



Note. Reprinted from *Teaching Young Language Learners* (2nd ed., p. 11) by A. Pinter, 2017, Oxford University Press. Copyright 2017 by Oxford University Press.

This systematic, immediate, and meaningful assistance that is adjusted to the needs of the child and provided by a more knowledgeable partner is referred to as *scaffolding*, which enables young learners to gain confidence, autonomy, and self-regulation, feel valued through praise, overcome difficulties, have a sense of control over the task, avoid distractions, and stay engaged and motivated to complete the task (Pinter, 2017; Vygotsky, 1978). As the past decade has seen the rapid development of educational technology, scaffolding can also be provided by such technology tools as AI chatbots, intelligent tutoring systems, and gamification, all of which can support learners within their ZPD, tailor content and tasks to their specific needs, provide immediate feedback, motivate them, and help them gain autonomy. According to Radesky and Zuckerman (2016), it is important that such digital media and applications properly challenge young learners' needed areas of learning within their ZPD.

Vygotsky (1978) claimed that each child is a unique learner and has his or her own ZPD, which is also a measure of their level of intelligence and ability, and it is important for teachers to know exactly what assistance needs to be provided next since young learners can make different uses of the same assistance from MKOs (Cameron, 2001). According to Vygotsky (1978), children gradually gain independence by becoming less reliant on the help provided by others and learning to do the same activities without any help. Over time, children become more autonomous and think inside their head instead of thinking aloud, which is referred to as *internalization* (Cameron, 2001, p. 7; Vygotsky, 1978). This process of internalization is especially important for language learning since young learners transform and internalize the new language input used by their teacher and peers and eventually make it part of their language skills and knowledge (Cameron, 2001).

Vygotsky's Sociocultural Theory (SCT) has strong implications for language teaching and learning in that teachers familiar with the ZPD can provide learners with appropriate tasks and activities to support their learning through constant monitoring and interaction. Since teachers can mediate what learners can learn next, they can organize

their lesson plans and tasks accordingly in a way that helps learners gain intrapersonal language skills (Cameron, 2001). Furthermore, being knowledgeable about YLs' ZPD enables teachers to start with what they already know about a foreign language and build on it based on their needs for development (Pinter, 2017). The theory has also significant implications for teacher talk especially in TEYL classrooms because the main source of language input for YLs, in most cases, is their teacher's language use (Pinter, 2017). Therefore, it is important for YL teachers to scaffold their early language production by providing them with a meaningful context that enables them to comprehend new input, interact with the teacher and with one another, and use language meaningfully by focusing on *words* and *interaction* (Pinter, 2017). Overall, since YLs' foreign language learning depends on what and how they are taught within their ZPD, it is highly important to provide them with rich language experiences with the target language skills (Pinter, 2017).

Teaching Vocabulary to Young Learners. In regard to how to teach vocabulary to YLs, Seashore (1948) claimed that engaging YLs' interest in the importance of learning new words first and then providing them with a systematic method for learning their meanings, pronunciation, and spelling leads to a far better outcome than drilling on certain words in reading. As a result, it is important for YL teachers to first provide YLs with interesting ways of learning vocabulary to make learning relevant to them.

According to Nation (2022), direct teaching of vocabulary can significantly enhance YLs' vocabulary learning. However, as opposed to adult learners, young learners get bored and distracted very fast if old, conventional vocabulary teaching methods and techniques are used in the L2 classroom (Bakhsh, 2016). As a result, they cannot be involved in the learning process. An effective classroom for YLs, therefore, should provide them with a colorful, cheerful and supportive atmosphere in which they can be involved in such engaging activities as puzzles, games, and songs (Harmer, 2009). Therefore, it is important for YL teachers to use attractive, motivating, and fun methods such as games especially when teaching vocabulary to achieve all learning outcomes (Bakhsh, 2016). Games are

effective in enhancing not only vocabulary learning but also vocabulary retention. According to Thornbury (2002), games can encourage learners to retrieve words successfully and quickly from memory, which can promote retention.

Using Technology in Teaching Vocabulary to Young Learners. The rapid dissemination of digital technology has influenced the way young learners learn foreign languages. Since young learners are also *digital natives* who have been surrounded with technology since they were born (Prensky, 2001), they can easily adapt to digital learning materials as compared to adults who did not grow up in the digital era. Furthermore, vocabulary learning software including digital games can enable learners to notice the target vocabulary by highlighting, coloring, styling, and flashing certain words, retrieve the vocabulary items by encouraging them to use the words repeatedly, and meet the items in various contexts and forms including spoken, written, and visual (Ebrahimzadeh et al., 2016; Nation, 2022). One of the digital technologies that can be integrated in the vocabulary teaching and learning process is digital gamification. In this regard, Hazar (2020) stated that integrating digital games in the process of teaching English vocabulary to young learners is much more effective than using traditional methods.

Gamification

As a term coined by Nick Pelling in 2002 (Pelling, 2011), gamification refers to “the use of game design elements in non-game contexts” (Deterding et al., 2011, p. 2). These contexts include various areas including education, and gamification is used for various purposes including learning. According to a definition provided by Richards and Schmidt (2013), games in language teaching refer to fluency activities, which are often used in Communicative Language Teaching (CLT) and humanistic methods, that have specific goals, set of rules, and a competitive, collaborative, and interactive environment in which learners need to acquire knowledge in order to succeed.

As a “process of making activities more game-like” (Werbach, 2014, p. 266), gamification impacts learners’ behavior and attitude towards learning in a positive way, meets learner needs, makes learning fun, and enhances learners’ motivation, engagement, and performance through game elements such as points, levels, badges, and progress bars (Goethe, 2019).

Gamified learning contexts are divided into two groups: non-technological gamified learning environments and technological contemporary gamified learning environments (see Table 1) (Goethe, 2019, p. 67). Gamification, thus, includes both digital and non-digital learning experiences. In the current study, therefore, the term “digital gamification” was used in order to indicate the focus of the research. A comparison between digital gamification and non-digital gamification was made by Foroutan Far and Taghizadeh (2022), who compared the effects of digitally gamified, non-digitally gamified, and non-gamified approaches with regard to EFL learners’ collocation knowledge, perceptions of using gamification for learning collocations, and sense of flow. The results indicated that the gamified groups outperformed the non-gamified group, had positive perceptions with regard to the implementation of gamification in learning collocations, and experienced a sense of flow.

Table 1

Non-Digitally versus Digitally Gamified Learning Experiences

Non-Digitally Gamified Learning Experiences	Digitally Gamified Learning Experiences
Learners are usually given premade games	Learners are more autonomous: they can choose, change, or create the gamified applications
Games are usually used as rewards or extra activities	Gamified applications are the parts of the learning and assessment process
Rules are set before playing the games	Learners are encouraged to determine the rationale behind game elements
Only winners are given incentives or prizes	Incentives or prizes are based on progressively challenging activities that require learners to use the skills they have gained, resulting in long-term retention

Tasks are usually independent	Gamified applications are usually based on collaboration and teamwork
Feedback mechanism is slow	Immediate feedback is provided
Learning environment is not fully active and competitiveness is low	Learning environment is active and competitiveness is high
Learners complete tasks to earn rewards rather than to acquire skills and knowledge	Learners complete tasks to acquire skills and knowledge and to earn rewards
Learners have lower levels of engagement and performance	Learners have higher levels of engagement and performance thanks to the integration of the latest technology and equipment in the learning process

Note. Tabulated information from *Gamification Mindset* (p. 67) by O. Goethe, 2019, Springer International Publishing. Copyright 2019 by Springer International Publishing.

In light of what has been mentioned so far, it can be stated that digitally gamified learning experiences enable learners to be autonomous, encourage collaboration and healthy competition, support learner-centered active learning, provide immediate feedback, and enhance motivation, engagement, and performance compared to non-digitally gamified or non-gamified learning experiences. In this respect, understanding gamification, as with any other approach to teaching and learning, necessitates familiarity with its theoretical basis.

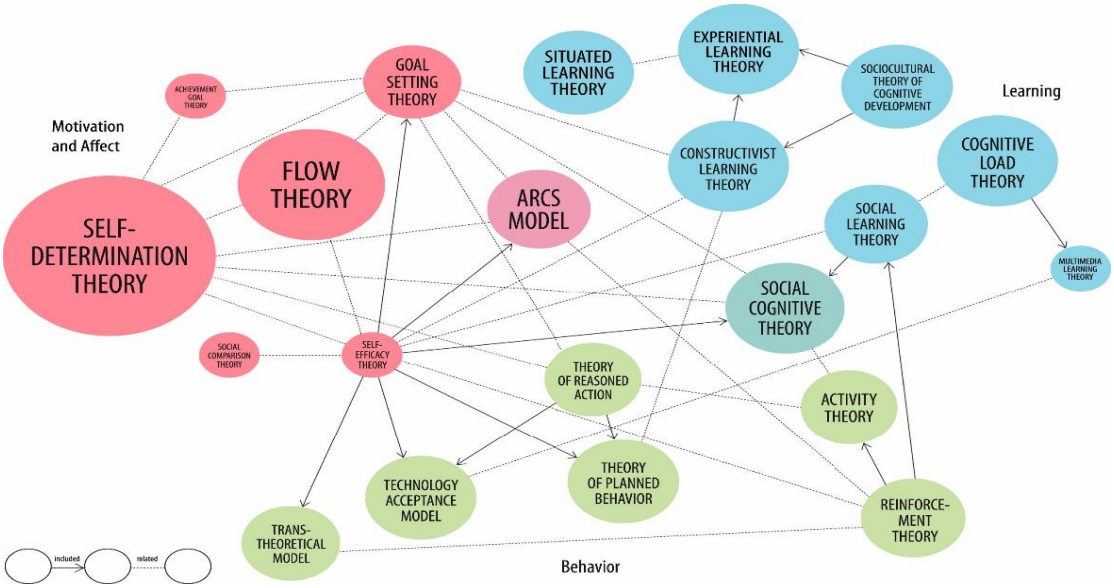
Theories Behind Gamification

There are certain theories from a variety of disciplines such as psychology, education, and sociology that constitute the theoretical basis of gamification. In an attempt to classify these according to their similarities and differences, Krath et al. (2021) advanced that theories behind gamification fall into one of three categories based on what they are concerned with: the decisive factors of motivation formation, behavior formation, or the learning process.

Figure 3 presented by Krath et al. (2021, p. 11) illustrates how the theories under each category are interrelated.

Figure 3

The Relationship between the Theoretical Foundations of Gamification



Note. Reprinted from *Revealing the theoretical basis of gamification: A systematic review and analysis of theory in research on gamification, serious games and game-based learning*, J. Krath, L. Schürmann, L., & H. F. O. von Korflesch, 2021, *Computers in Human Behavior, 125*, p. 11. Copyright 2021 by The Authors, published by Elsevier Ltd. Licensed under CC BY.

Similar to the categorization put forward by Krath et al. (2021), Eccles and Wigfield (2002) suggest that intrinsic motivation theories, which include the Self-Determination Theory (Ryan & Deci, 2000b) and Flow Theory (Csikszentmihalyi, 1975), focus on the determining factors of engagement. On the other hand, theories focusing on behavioral change, such as the Technology Acceptance Model (TAM) proposed by Davis (1989) which suggests that the behaviors of individuals using new technologies are driven by perceived usefulness and perceived ease of use, aim to lead to positive outcomes regarding behaviors. Finally, theories focusing on learning such as the Sociocultural Theory proposed by Vygotsky (1978) seek to determine what helps learners achieve success and what happens during this process. Since the current study focuses particularly on the theories of

motivation and learning, this section will provide an overview of the Self-Determination Theory, Flow Theory, and Sociocultural Theory, the major theories behind gamification.

Self-Determination Theory. Motivation has long been a major area of interest in the fields of education and psychology. As a motivational theory, the Self-Determination Theory (SDT) (Deci & Ryan, 1985; Ryan & Deci, 2000b) is concerned with the interplay between intrinsic motivation that comes from within and extrinsic motivation that comes from external forces, and it focuses particularly on how to provide the necessary conditions to enhance and maintain the former. While intrinsic motivation is a motivation to engage in an activity for interest, enjoyment, inherent satisfaction, curiosity or "for its own sake" (Ryan & Deci, 2020; Deci & Ryan, 2000), extrinsic motivation is a motivation to engage in an activity for instrumental or external reasons such as rewards and incentives (Eccles & Wigfield, 2002; Ryan & Deci, 2020). SDT suggests that individuals have a natural inclination towards psychological development, and there are certain contextual factors that promote or undermine self-determined motivation, achievement, and well-being (Ryan & Deci, 2002; Ushioda, 2013). In an educational context, therefore, SDT implies that there are basic psychological needs of students and teachers that, if satisfied, facilitate their intrinsic motivation, internalized extrinsic motivation, performance, and well-being (Ryan & Deci, 2020). Ryan and Deci (2000b) listed these innate psychological needs of individuals as the need for competence, autonomy, and relatedness.

- *The need for competence* refers to having a feeling of being able to carry out a task or activity with mastery (Baah et al., 2023). Competence, therefore, is not an acquired skill; instead, it is a sense that individuals feel when they engage in activities with optimal challenges which may enable them to enhance their skills and reach their full potential (Ryan & Deci, 2002).
- *The need for autonomy* refers to individuals' feeling of having control over their actions without feeling under pressure (Baah et al., 2023). The experience of autonomy does not refer to not depending on any external

influences; instead, it emphasizes individuals' feeling of carrying out tasks out of their own volition (Ryan & Deci, 2000b; Ryan & Deci, 2002).

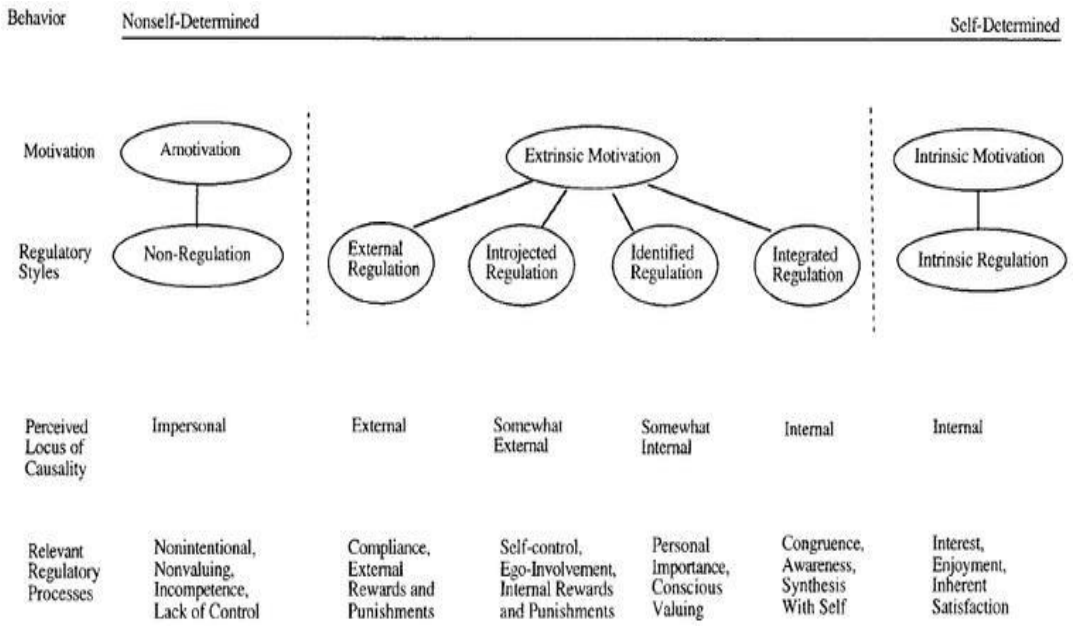
- *The need for relatedness* refers to the feeling of being connected with (Ryan & Deci, 2002) and recognized by others (Baah et al., 2023). It signifies the psychological sense of individuals to be an integral part of a community in which they feel safe, secure and valued (Ryan & Deci, 2002).

Although many researchers claim that there is a clear distinction between intrinsic motivation and extrinsic motivation, SDT advances that they are not two sides of the same coin but they refer to a variety of motivation types on a continuum (Richter et al., 2015; Ryan & Deci, 2000a, 2000b). Figure 4 shows Ryan and Deci's (2000b, p. 72) illustration of the processes of *internalization* and *integration* by which a person takes in a regulation and transforms it into their unified sense of self, which demonstrates how a person's motivation for behavior can change on the continuum ranging from amotivation to intrinsic motivation, depending on to what degree the motivation for their behavior emanates from their self (Ryan & Deci, 2000a, pp. 60-61). As internalization increases in this process, positive attitudes, engagement, and persistence also increase (Ryan & Deci, 2000a). While teaching young learners, it is especially important to take into consideration the fact that children experience developmental progression and self-regulation at varying paces and achieve varying levels of regulation since they have individual differences with regard to their motivational orientations such as their styles of regulation (Deci & Ryan, 1985). If their desires conflict with regulations, for instance, it is more difficult for them to achieve internalization compared to adults (Deci & Ryan, 1985). Therefore, teachers need to acknowledge these individual differences in regulatory styles and provide their students with activities that meet their needs of competence, autonomy, and relatedness to facilitate the process of internalization and to maintain intrinsic motivation (Ede, 2022; Deci & Ryan, 1985; Ryan & Deci, 2000b). In this regard, gamification, if implemented properly and holistically by incorporating various game elements, can increase learners' overall

motivation and have a positive effect on learning outcomes (Ede, 2022). Furthermore, combining various game elements in learning can satisfy learners' basic psychological needs for competence, autonomy, and relatedness (Sailer et al., 2017; Zainuddin, 2018).

Figure 4

The Self-Determination Continuum



Note. Reprinted from *Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being* by R. M. Ryan & E. L. Deci, 2000b, *American Psychologist, 55*(1), p. 72. Copyright 2000 by the American Psychological Association, Inc. Published by American Psychologist.

Deci and Ryan (1985) proposed a sub-theory within SDT, which they referred to as Organismic Integration Theory (OIT), to explain how intrinsic and extrinsic motivation develops, moving "from extrinsic regulation toward integrated self-determined regulation of activities that are not themselves intrinsically interesting" (p. 264). In context of education, the steps in this process of development go hand in hand with the improvements in the effectiveness of learning (Deci & Ryan, 1985). As can be seen from Ryan and Deci's (2000b, p. 72) illustration, regulatory factors such as interest, enjoyment and satisfaction promote self-determined and intrinsically motivated behavior and intrinsic regulation. While

amotivation, which is at the far left of the taxonomy, refers to the state in which a person lacks an intention to act and a sense of individual causation, external regulation refers to actions performed to meet demands or obtain rewards, introjected regulation refers to actions performed to avoid anxiety or enhance ego, and identification refers to actions performed because of their personal importance or value (Ryan & Deci, 2000a). Internalization and integration of nonintrinsically motivated behaviors, on the other hand, enables individuals to reach integrated regulation in which they can have the most autonomous kind of extrinsic motivation (Ryan & Deci, 2000a), although it is still not fully self-determined (Eccles & Wigfield, 2002). Ryan and Deci (2000a, 2000b) made a distinction between intrinsic motivation and integrated regulation, stating that the latter is carried out for its instrumental value and for the sake of achieving separable outcomes rather than doing it for its own sake, even though it is valued by one's self. Finally, intrinsic motivation, which is at the far right of the taxonomy, refers to doing an activity because it is inherently satisfying, and not for any separable outcomes (Ryan & Deci, 2000a). In a learning environment in which learners are provided with a sense of optimal challenges, self-determination and connectedness; the achievements, well-being, integration, internalization, and intrinsic motivation of learners can be highly enhanced, which, in turn, enhances the quality of learning and creativity (Ryan & Deci, 2000a, 2000b).

Recent trends in technology have led to a proliferation of studies that seek to reveal the theoretical foundations of gamification. Among these, Krath et al. (2021) found that the Self-Determination Theory was the most common theory regarding motivation and performance, which are the main objectives of gamification (Sailer et al., 2017; Kalogiannakis et al., 2021). Moreover, SDT is one of the most comprehensive theories in the field of gamification as it comprises a wide range of motivational mechanisms (Sailer et al., 2017). As a result, there have been a number of empirical studies that investigate the effects of intrinsic and extrinsic motivation on learners' academic performance. In this regard, Ryan and Deci (2020) have found that intrinsic motivation and autonomous types

of extrinsic motivation are promoted when learners' innate psychological needs are satisfied, leading to better outcomes for learners from various stages of education and cultures. Moreover, it has been found that traditional models of motivation undermine teacher motivation by thwarting their psychological needs and, in turn, student motivation, which signifies the importance of integrating technology into classroom (Ryan & Deci, 2020). Therefore, providing learners with meaningful game experiences and emerging gaming technologies leads to enhanced intrinsic motivation, engagement and positive learning outcomes (Ryan & Rigby, 2020). Furthermore, AI-based tools can meet learners' need for competence, autonomy, and relatedness by providing them with individualized learning experiences, allowing them to be responsible for their own learning, encouraging them to be autonomous in their learning process, and enhancing interactions between teachers and learners and between learners themselves (Wu, 2023). In conclusion, it is of great importance for teachers to provide learners with an environment that allows self-determination, supports autonomy, and promotes intrinsically motivated learning (Deci & Ryan, 1985).

Flow Theory. The Flow Theory, as proposed by Csikszentmihalyi (1975), posits that there is a sense of optimal experience in which learners are able to deal with the challenges they encounter with an intense form of concentration leading to a distortion of the sense of time and self-consciousness. This sensation that individuals feel when they become totally involved in an activity is referred to as *flow*, which typically occurs when the activity constantly poses challenges, and thus, there is no time for them to get bored or worried (Csikszentmihalyi, 1975). This is similar to Krashen's (1982) Forgetting Principle regarding the optimal input, which suggests that learners acquire a language when the input is so interesting and relevant that they totally focus on what is said and even forget that it is in a foreign language. In such a situation, the optimal learning emerges when the present activities are "both problematic and soluble" (Mitchell, 1988, p. 36). In regard to self-contained flow activities, there are certain conditions put forward by Csikszentmihalyi (1975,

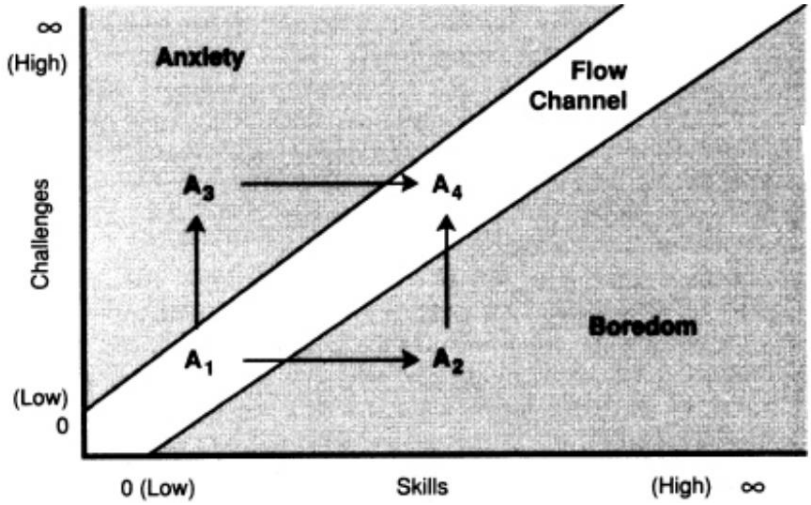
1988, 1990, 1998) that are necessary for an individual to experience flow, which can be summarized as follows:

- An autotelic (e.g., intrinsically rewarding and enjoyable) activity that is carried out for its own sake rather than the extrinsic rewards it may provide
- A clear and logical set of goals
- A perceived balance between challenges and skills
- Intense concentration on the activity at hand
- A sense of control over the activity
- Immediate, accurate, and unambiguous feedback
- A loss of the track of time
- A merging of action and awareness
- An absence of self-consciousness

In order to further explain how flow experience occurs, Figure 5 presented by Csikszentmihalyi (1990, p. 74) illustrates the variations of flow experience across different situations as perceived by individuals when they are involved in an activity.

Figure 5

The Flow Diagram



Note. Reprinted from *Flow: The Psychology of Optimal Experience* (p. 74) by M. Csikszentmihalyi, 1990, HarperCollins e-books.

This flow diagram advanced by Csikszentmihalyi (1990, p. 74) presents four categories representing the conditions involved in a specific activity (e.g., a game) when both challenges and skills are low (A1), skills are high but challenges are not (A2), challenges are high but skills are not (A3), and both challenges and skills are high (A4). The diagram has strong implications for teaching and learning in the foreign language classroom as it stresses the importance of the interaction between skills and activities (Egbert, 2003). This model suggests that when an individual first starts carrying out an activity, he has almost no skills, and the first step of the activity is not that difficult. Therefore, there is a balance between challenges and skills, and the individual is in flow (A1). However, if he stays there long, his skills will improve, and the activity will become too easy for him, which causes boredom (A2). On the other hand, the model implies that if the individual meets a more competent peer, he will comprehend that there are many challenging steps ahead, and he will feel anxious about their low performance (A3).

Since boredom and anxiety are not optimal experiences, the individual will wish to be in the flow state again by increasing the challenges he encounters to overcome boredom, and by increasing his skills to overcome anxiety. Thus, the individual will be in flow again (A4), but this time with higher skills and challenges that lead to a more complex experience than his first time in flow (A1). Since an individual cannot be motivated to carry out the same activity for a long time, he will have an inclination to repeat the flow experience whenever possible (Csikszentmihalyi, 1988) by reaching an even higher level of complexity than A4 (Csikszentmihalyi, 1990). In view of what has been mentioned so far, it can be assumed that the dynamic nature of flow experiences results in growth and discovery (Csikszentmihalyi, 1990).

In this regard, the only situation in which the state of flow can be truly experienced is when challenges and skills are above average and balanced (Nakamura, 1988). In other

words, individuals experience flow when they are completely involved in using their skills to overcome the challenges that are “just about manageable”, which constantly prompts them to learn new skills and increase the challenges they face (Csikszentmihalyi, 1998).

This definition of optimal challenge is similar to Krashen’s (1985) Comprehensible Input, which suggests that the language input should be both intelligible and slightly more advanced than a learner’s current level of competence in order for language acquisition to occur. Krashen (1985) further explained his hypothesis by referring to a learner’s current level as *i*, and symbolizing the optimal input that is a bit more challenging but still manageable as *i+1*. In the context of foreign language learning, therefore, the activities need to be both challenging and possible to be completed with the required skills (e.g., listening, speaking, reading, writing, vocabulary, grammar, and pronunciation) in order to lead learners to a state of flow without making them feel bored or anxious. The flow theory further relates to Krashen’s (1985) Affective Filter Hypothesis, which suggests that if learners are provided with comprehensible input, they can feel safe and relaxed, and thus their affective filter can be lowered to facilitate language acquisition.

According to Csikszentmihalyi (1990), flow activities need to be enjoyable in order for individuals to achieve optimal experience more easily. Moreover, the more enjoyable, autotelic (i.e., activities that individuals engage in just for the sake of doing it, without expecting extrinsic rewards), and intrinsically motivating the activities and experiences are, the more likely they are to be remembered, retained, and transferred from short-term memory into long-term memory storage (Csikszentmihalyi, 1988). As a type of active leisure, games are of great potential in enabling learners to experience flow (Csikszentmihalyi, 1998). First of all, individuals can experience flow easily through games since they provide players with a self-contained environment that encompasses a clear and compatible set of goals, immediate feedback, and rules, which enables them to act without being worried about what needs to be done and how to do it (Csikszentmihalyi, 1998). Since games include such motivating components as rules, goals, and feedback, they can provide

a great opportunity for optimal experience, learning, and retention to take place (Csikszentmihalyi, 1990). Since games have exciting and engaging elements, they provide young learners with “the perfect balance between boredom and anxiety” (Ham, 2020, p. 42) in which they can experience the flow mindset (Csikszentmihalyi, 1975). In this regard, implementing gamification can enable learners to experience a sense of flow as it provides enhanced levels of concentration and engagement through a balance between challenges and skills (Foroutan Far & Taghizadeh, 2022). Furthermore, the platforms that are AI-powered can enable learners to experience a sense of flow by providing them with immediate feedback and answers and keeping them engaged (Stojanov, 2023).

The Sociocultural Theory. Vygotsky (1978), after analyzing the physical and social relationship between individuals and their environment, put forward the Sociocultural Theory, which stresses the importance of engaging in social interactions with others that are more knowledgeable in children’s cognitive development. According to this theory, social interaction with more knowledgeable or component adults or peers enables children to accomplish what they cannot do alone. In this regard, Vygotsky (1978) proposed the Zone of Proximal Development (ZPD) concept, which he defined as the difference between children’s “actual developmental level”, which is revealed when they solve problems independently, and their “potential development”, which is acquired when they solve problems with the assistance and collaboration of adults or more knowledgeable peers (p. 86). In other words, while the actual developmental level refers to “functions that have already matured”, the Zone of Proximal Development refers to “functions that have not yet matured but are in the process of maturation” (Vygotsky, 1978, p. 86).

In this regard, Vygotsky (1978) proposed that certain internal developmental processes only arise when a child is provided *scaffolding*, which refers to the support provided by more knowledgeable peers or adults to adjust tasks and complexity to learners’ skills, knowledge, and needs in order to help them achieve success within their zones of proximal development (Krath et al., 2021). The rationale behind scaffolding is that the

assistance and guidance provided by MKOs is gradually removed and the child eventually becomes able to carry out the same tasks independently with more developed skills and knowledge. According to Vygotsky (1978), optimal learning takes place when the task given to children is neither so easy that they can do it without any help, nor so challenging that they cannot do it even with the help of others (Silverman, 2011). In other words, children need to be provided challenges that are not much but a little beyond what they can overcome independently and assisted in this process so that they can make progress. In second language acquisition (SLA) research, therefore, certain assumptions have been made regarding the comparability of the ZPD and Krashen's (1985) concept of *i+1*. Guerra (1996, p. 7), for instance, claimed that *i* refers to a child's actual developmental level while *i+1* refers to the Zone of Proximal Development, although these two constructs are incommensurable especially with regard to how they perceive the role of social interaction in SLA (Dunn & Lantolf, 2008).

Children acquire knowledge with the collaboration, help, guidance, and scaffolding of their teachers, adults, or peers, whom Vygotsky (1978) called *More Knowledgeable Others*. MKOs are those who are competent and knowledgeable enough to develop children's skills by guiding them to solve problems (Rohman & Fauziati, 2022). The MKOs can refer to digital tools such as AI chatbots as well as human beings (Stojanov, 2023). Since such tools have vast amount of data, they can be even more effective than human MKOs especially if the topic involves more than one specialized area (Stojanov, 2023).

In this regard, digital gamification can provide learners with scaffolding by interacting with them, establishing opportunities for them to interact and collaborate with their teachers and peers, providing them with personalized learning experiences, and guiding them throughout their learning process. Many gamification applications use AI technology to tailor tasks, content, and materials to each learner's individual needs, vocabulary strengths and weaknesses, learning behavior, and even calculate the right time for intelligent spaced repetition to enable them to transfer information into the long-term memory (Marsden,

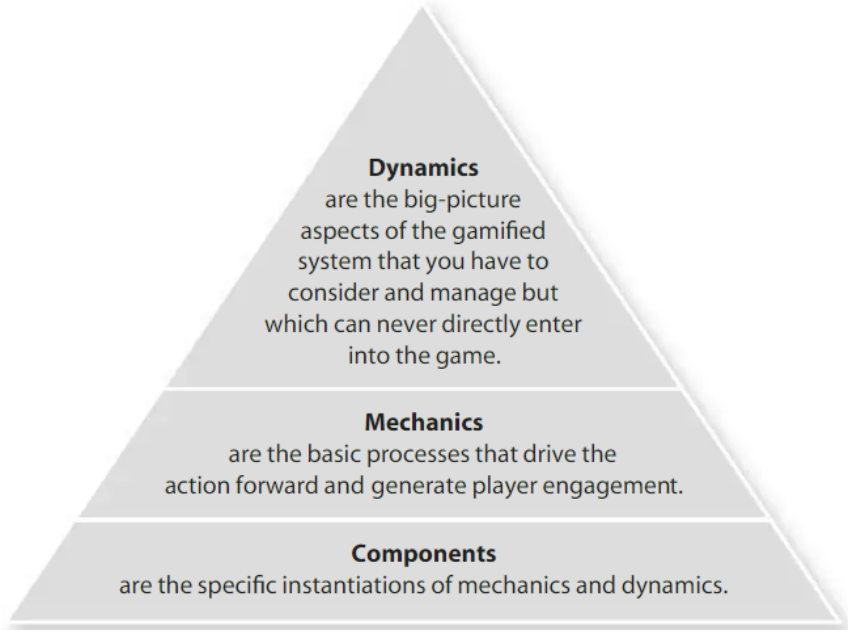
2023). As Krath et al. (2021) also stated, the adaptive content of gamification is directly linked to the Sociocultural Theory as it enables learners to be assisted within their zones of proximal development based on their needs and abilities. For instance, games can manipulate the challenges that learners encounter in a way that they are neither too easy nor too difficult but just above their current level considering their ZPD (Davis et al., 2018). In this sense, AI-powered tools and platforms, in alignment with the SCT, can be used as MKOs to scaffold learners' learning by enabling them to move from their current developmental level to the ZPD through instant replies, tailored content, and adaptive feedback (Stojanov, 2023). Apart from interacting directly with learners, these tools and platforms also enable learners to collaborate, communicate, and interact with their teachers and peers by engaging them in social activities (Wu, 2023). Furthermore, game design elements such as feedback, signposting, hints, suggestions, glowing choices, and tips enable learners to accomplish tasks that they would not be able to complete otherwise by guiding them within their zones of proximal development (Klock et al., 2020; Krath et al., 2021; Tondello et al., 2017).

Game Design Elements

With regard to game design frameworks, each game is made up of game elements, which are specific characteristics of games that can be implemented in gamification (Goethe, 2019; Werbach & Hunter, 2012). Based on a categorization provided by Werbach & Hunter (2012), game elements are divided into three categories based on their hierarchical level of abstraction: dynamics, mechanics, and components, where dynamics refer to the highest level elements and components indicate the lowest level (see Figure 6) (pp. 78-82). These game design elements, along with game aesthetics such as visuals and audio, lead players to have meaningful gamification experiences (Goethe, 2019). Although it is not possible to incorporate all of the elements in a gamification design, various forms of game elements should be integrated in order for gamification to be effective, engaging, and meaningful (Werbach & Hunter, 2012).

Figure 6

The Game Element Hierarchy



Note. Reprinted from *For the win: How game thinking can revolutionize your business* (p. 82) by K. Werbach & D. Hunter, 2012, Wharton Digital Press. Copyright 2012 by Kevin Werbach and Dan Hunter.

As reflections of the big picture that presents the structure of a game, game dynamics control the boundaries of actions and the pace and speed at which the activities and game moves, empower and restrict players in certain ways, set the rhythm and tone for a successful game, and foster engagement (Goethe, 2019). Game dynamics consist of *constraints* (i.e., rules that restrict players in specific ways), *emotions* (e.g., players' feelings about a game such as interest, joy, competitiveness), *narrative context* (i.e., embedded narrative with pre-existing content or emergent narrative), *progression* (i.e., the process in which players develop or move towards a more advanced level or status), and *relationships* (i.e., the social interactions and collaborations in the form of game-player actions, games' internal interactions with themselves, and player-player interactions), which are fundamental for making meaningful choices in a game (Goethe, 2019; Werbach & Hunter, 2012, p. 78).

As basic processes that trigger players' action in a game, engage them, keep them involved, and act as a stepping stone for them to achieve one or more of the game dynamics, game mechanics can be listed as *challenges* (i.e., activities that need great effort to complete), *chance* (i.e., randomness), *competition* (i.e., a situation where players are trying to win), *cooperation* (i.e., a situation where players work together for a common goal), *feedback* (i.e., information about the player's performance), *resource acquisition* (i.e., obtaining collectible items in a game), *rewards* (i.e., benefits given to players in exchange for their achievements), *transactions* (i.e., the activity of exchanging items between players), *turns* (i.e., players' sequential participation), and *win states* (i.e., a condition that requires players to successfully complete predetermined objectives to be a winner) (Werbach & Hunter, 2012, p. 79). With each of these mechanics, the game dynamics can be achieved.

As specific instantiations that connect player actions to one or more higher level game dynamics and mechanics, game components include *points*, *badges*, *leaderboards*, *achievements*, *avatars*, *collections*, *content unlocking*, *levels*, *quests*, *social graphs*, *teams*, *virtual goods*, etc. (Goethe, 2019, p. 73; Werbach & Hunter, 2012, pp. 80-81). As stated by Werbach & Hunter (2012), gaining an understanding of the ways that points, badges, and leaderboards (i.e., "the PBL triad") are used as components in gamification is necessary for building a successful gamification system when their effectiveness, practicality, and relevance are taken into account (p. 72). As a way to track players' progress, points are used to motivate and encourage learners to complete tasks with the aim of accumulating things, encourage competition, tell learners how successfully they are playing, create a win state, connect progression with extrinsic rewards such as real world prizes, provide explicit, immediate, and constant feedback, act as an external indicator of progress, and give learners a sense of competence (Werbach & Hunter, 2012, pp. 72-73). For instance, Busuu, which is one of the digital gamification tools used in the current study, enables learners to collect points and stars through a variety of activities such as completing lessons and reviews with correct answers, correcting other users' errors, overcoming weekly challenges,

and completing checkpoints to advance through the leaderboard and leagues (Busuu, 2023a). Badges, on the other hand, are visual representations of achievements in the process of gamification that are used to motivate players to exceed certain point thresholds (Werbach & Hunter, 2012). One advantage of badges is that they are flexible: there are various types of badges for many different types of activities, which makes the process of gamification engaging and meaningful for diverse groups of players in a way that a single points system cannot (Werbach & Hunter, 2012). For instance, Duolingo, another digital gamification tool used in the current study, enables learners to earn achievement badges for their successes such as completing a certain number of lessons without mistakes, earning a certain number of crowns, and finishing first in the diamond league; exclusive badges for completing monthly challenges through daily quests; and personalized badges for major milestones such as achieving new personal bests like earning the longest streak, daily most XP (i.e., experience points), perfect lessons, and best league finish to help learners have a sense of progress and stay motivated (Shuttleworth, 2023). As a way to inform learners about their ranking relative to their peers by tracking various attributes in a gamified system, leaderboards motivate learners to climb to the higher ranks and eventually reach the top (Werbach & Hunter, 2012). Overall, the PBL triad is widely used in gamification design. In order to maximize the effectiveness of gamification, however, one needs to move beyond PBLs and incorporate other game elements as well (Werbach & Hunter, 2012).

In this regard, Chou's (2019) Octalysis Framework identifies eight core drives of gamification, *epic meaning and calling*, *development and accomplishment*, *empowerment of creativity and feedback*, *ownership and possession*, *social influence and relatedness*, *scarcity and impatience*, *unpredictability and curiosity*, and *loss and avoidance*, each of which can make games more fun, engaging, and rewarding. According to Chou (2019), players' drives of becoming part of something greater than themselves, leveling up, making progress, overcoming challenges, using their creativity, receiving meaningful feedback,

collecting items, customizing their avatar, collaborating and cooperating with others, wanting something because of not being able to get it, craving to find out what will happen next, and avoiding something negative such as losing all progress make them both extrinsically and intrinsically motivated to take the actions in a game.

Another game design framework that offers a useful insight into how gamification works is the MDA (Mechanics, Dynamics, Aesthetics) Framework advanced by Hunicke et al. (2004), which is based on players' relatively unpredictable consumption of game artifacts created by designers. In this model, Hunicke et al. (2004) break this consumption process of games into the parts of *rules*, *system*, and *fun*, and posit that they correspond to three design counterparts: *mechanics* (i.e., a variety of rules provided to players to support overall game dynamics), *dynamics* (i.e., interactions that emerge from players' engagement with the game mechanics and support aesthetic experiences), and *aesthetics* (i.e., the emotional responses evoked during players' interaction with the game system), in which mechanics lead to dynamic system behavior, which then leads to aesthetic experiences that eventually result in fun games.

Gamification in the EFL Classroom

In recent years, there has been an increasing amount of literature on the effect of gamification on teaching and learning English as a foreign or second language. Much of the current literature have reported that gamification enhances learners' foreign language performance, is perceived positively by learners, provides them with scaffolding, and boosts their motivation, engagement, interest, satisfaction, enjoyment, competence, and autonomy (Dehghanzadeh et al., 2019; Dehganzadeh & Dehganzadeh, 2020; Shortt et al., 2021). Basically, studies regarding the use of gamification in the EFL classroom were conducted on a variety of topics including the comparison of gamification versus non-gamification methods (Avila & Fonseca, 2021; Doğan, 2023; Ertürk, 2023; Foroutan Far & Taghizadeh, 2022; Hazar, 2020; Liu et al., 2024; Zainuddin, 2018), the effect of gamification on learners' language skills (Avila & Fonseca, 2021; Doğan, 2023; Ertürk, 2023; Hazar, 2020; Liu et al.,

2024; Lui, 2014; Qiao et al., 2024; Young & Wang, 2014), the effect of gamification on learners' motivation and engagement (Avila & Fonseca, 2021; Doğan, 2023; Ertürk, 2023; Foroutan Far & Taghizadeh, 2022; Liu et al., 2024; Predyasmara et al., 2022; Qiao et al., 2024; Sailer et al., 2017; Turgut & İrgin, 2009; Young & Wang, 2014; Zainuddin, 2018), the effectiveness of various game design elements (Sailer et al., 2017), digital versus non-digital gamification (Foroutan Far & Taghizadeh, 2022), and collaborative versus individual/competitive gamification (Ertürk, 2023; Qiao et al., 2024).

Several studies thus far have investigated various ways of implementing gamification. Qiao et al. (2024), for instance, compared three different types of gamification: competitive, cooperative, and collaborative. In their quasi-experimental study where they employed a mixed methods research design combining quantitative and qualitative data, they randomly assigned 156 secondary school EFL learners in China to competitive, cooperative, or collaborative gamification groups. While the learners in the competitive group worked individually, the learners in the cooperative group completed the tasks individually and competed against each other both individually and as a group, and the learners in the collaborative group worked collaboratively and competed against each other as groups. In regard to leaderboards, the competitive group was ranked on individual leaderboards, the cooperative group was ranked both on individual and team leaderboards, and the collaborative group was ranked on team leaderboards. In contrast to earlier findings, the quantitative results revealed that the competitive group significantly outperformed the cooperative group in terms of morphological awareness, word reading, and reading comprehension, and the collaborative group in terms of morphological awareness. As they stated, this might have been due to the fact that team leaderboards in the collaborative group did not show individual rankings, and, as a result, learners felt demotivated since their contributions were not recognized. In order to explore learners' gamified learning experiences, they also conducted a semi-structured interview with six focus groups. The thematic analysis showed that a common theme across the three groups

was that they were more engaged to participate in the gamified activities as compared to the regular non-gamified activities, mainly as a result of game design elements, with leaderboards being the most commonly reported one. It was also revealed that most learners found gamification fun and rewarding. Also, learners indicated that they were motivated to work hard to win. Finally, learners' responses demonstrated that gamification led to long-term knowledge retention.

In Lui's (2014) study in which she investigated the effectiveness of web 2.0 gamification tools in vocabulary learning and retention, a total of 91 undergraduate students at a university in China learned and reviewed vocabulary using "Content Generator" and "Jeopardy", which are online game platforms that allow users to create interactive vocabulary activities. She then conducted a survey to explore the participants' opinions on and attitudes towards the use of gamification in the process of vocabulary learning. The results revealed that most students found gamification more effective than using worksheets in terms of both vocabulary learning and retention, reporting that games are more fun, exciting, interesting, and motivating. Although the overall feedback was positive, some participants reported that they found games more challenging, intimidating and frustrating, which Lui (2014) stated might have resulted from their lack of familiarity with online games and time pressure.

Addressing gamification elements through a Self-Determination Theory framework, Sailer et al. (2017) investigated the effects of various game design elements on the fulfillment of the psychological needs for competence, autonomy, and social relatedness. With this aim, they randomly assigned 699 participants to the control group that only included points, the first experimental group that included badges, leaderboards, and performance graphs, and the second experimental group that included avatars, narrative stories, and teammates. At the end of the simulated game, a questionnaire was administered to assess learners' psychological needs. The multivariate analysis of variance (MANOVA) and further post-hoc test results revealed that badges, leaderboards, and

performance graphs gave learners a sense of competence and autonomy with regard to task meaningfulness. Furthermore, avatars, narrative stories, and teammates provided them with a sense of relatedness. Finally, they concluded that the effectiveness of gamification implementations may affect the degree to which game design elements can satisfy basic psychological needs.

With regard to intrinsic motivation, Predyasmara et al. (2022) investigated whether gamification increases learners' intrinsic motivation towards learning English using the "Quizziz" platform in online English lessons throughout the pre-cycle, first cycle, and second cycle, and using observations, questionnaires, and interviews as data collection tools. Using classroom action research, they worked with 20 8th grade students. They stated that the questionnaire was based on the Intrinsic Motivation Inventory used by Reynolds (2006), and included the subscales of interest/enjoyment, perceived competence, pressure/tension, effort/importance, perceived choice, and value/usefulness. The results showed that there was a statistically significant difference between the pre-cycle and first cycle, and between the first cycle and second cycle in terms of the mean scores of intrinsic motivation questionnaire, indicating an improvement in intrinsic motivation. In the interview, most participants reported that gamification enhanced their online English learning process, that gamification was not tedious or exhausting but exciting and fun, that the platform was easy to use, and that they felt motivated to learn English. The study concluded that gamification increased learners' intrinsic motivation towards learning English.

In their study where they compared digital gamification and non-digital gamification and investigated their effects on EFL learners' collocation learning, satisfaction, perceptions, and flow experience, Foroutan Far and Taghizadeh (2022) randomly assigned 75 B1-level Iranian EFL learners enrolled in a language institute to the digitally gamified, non-digitally gamified, and non-gamified groups. In order to investigate the effect of gamification on collocation learning, they administered a pre- and post-test of collocation. They also asked the learners in the gamified groups to fill in a flow theory questionnaire and

answer open-ended questions on their flow experience with regard to engagement in gamification, losing track of time, and the balance between the challenges of the games and learners' skills to investigate whether gamification has an effect on learners' sense of flow. Finally, they conducted a semi-structured interview with the gamified groups to explore their satisfaction and perceptions regarding the use of gamification in learning collocations. The quantitative data analysis through one-way analysis of variance (ANOVA) showed that although there were no significant differences between the three groups' pre-test scores, a significant difference was found between the groups' post-test scores. In order to determine where the significant difference lies, they conducted post-hoc tests.

The results demonstrated that although the mean score of the digitally gamified group was not significantly different from that of the non-digitally gamified group, both of the gamified groups significantly outperformed the non-gamified group. The thematic analysis of the interview data revealed that most learners in the gamified groups were satisfied with the use of gamification in their process of collocation learning as it was challenging, highly competitive, enjoyable, fun, and more efficient. It was also found that game elements, teamwork, sharing knowledge, and the sense of competition enhanced collocation learning, and it enabled them to remember collocations in the long-term. A minority of the learners, however, reported that gamification was too stressful because they did not want to lose. Their perceptions of the use of gamification further revealed that it helped them forget about time and place, enabled them to focus on learning, and encouraged them to try harder and learn better than traditional methods. In regard to their experience of sense of flow, the learners in the gamified groups indicated that there was a match between the challenges they encountered in games and their skills to overcome them, although the non-digital group had a higher mean score than the digital group. As for absorption in the games, most learners in the gamified groups strongly agreed that they concentrated fully on the games, and the non-digital group had again a higher mean score than the digital group. Pearson product-moment correlation revealed that there was a strong positive relationship between

the balance between challenges and skills and concentration on the games. In regard to the open-ended question about engagement, most learners in the digital group reported that they were highly engaged in the games as games fostered their interest, engagement, competition, and teamwork while a minority of them reported that they were somewhat engaged in the games because they felt confused. Furthermore, the learners in the digitally gamified group agreed that they lost track of time since gamification was enjoyable and fun, it encouraged teamwork, and they were concentrated on the games. Moreover, most learners in the digitally gamified group indicated that they used their skills to overcome the challenges, which allowed them to learn from their mistakes, while a minority of them stated that their skills did not completely match the challenges with regard to collocations. Most learners in the non-digitally gamified group also agreed that they had a high level of engagement, they forgot about time and place, and their skills matched the challenges because of reasons similar to those reported by the digitally gamified group.

In regard to the Self-Determination Theory, Zainuddin (2018) investigated the effect of gamified flipped class instruction on learners' learning achievement and perceived motivation employing an explanatory sequential mixed methods research design through which he triangulated quantitative and qualitative data. With this aim, he assigned 56 learners aged between 15 and 16 years to the gamified flipped experimental group and the non-gamified flipped control group using non-random assignment. In order to investigate learners' learning performance, he administered three formative assessments. Furthermore, he conducted questionnaires and interviews to explore their perceived motivation. The results showed that although there were no significant differences between the groups' mean scores in the first post-test, learners in the gamified flipped class significantly outperformed those in the non-gamified flipped class both in the second and third post-test, indicating that gamification led to a higher academic performance. Furthermore, the questionnaire and interview results revealed that gamification had a

positive effect on learners' motivation towards learning, engagement, and the basic psychological needs of competence, autonomy, and relatedness.

In their mixed methods research where they investigated the effect of gamification on EFL learners' L2 vocabulary learning, retention, and engagement, Avila and Fonseca (2021) assigned 51 9th grade high school EFL learners at the CEFR A1-A2 level who took 45-minute English lessons per week to an experimental group that used gamified vocabulary learning through a card game, and a control group that received traditional vocabulary lessons with worksheets and rote learning. In order to measure learners' immediate passive recall and recognition and delayed passive recall and recognition, they administered immediate and delayed post-tests to both groups. Furthermore, four semi-structured interviews were conducted with the learners in the experimental group to explore their feelings, engagement, and perceptions of the card game. The qualitative analysis of the interviews revealed that the gamified approach enhanced learners' motivation, engagement, enjoyment, and willingness to take part in the games thanks to such game elements as competition. Furthermore, they stated that they would prefer gamified vocabulary learning over traditional approaches thanks to such game elements as appealing images. For the test data, t-test results showed that although both groups remembered and retained a considerable number of the target vocabulary items, there were no differences between their vocabulary gains. As a result, the researchers concluded that gamified vocabulary learning was as effective as traditional vocabulary learning.

A number of studies on the use of gamification in L2 teaching and learning have been conducted in Türkiye in various levels of education and with different groups of learners. For instance, Doğan (2023) conducted a study on the effect of gamification elements on engagement and vocabulary learning in a university in Türkiye. In this study, he randomly assigned 69 participants in an English for Academic Purposes (EAP) class to one of the three groups: a control group that received traditional instruction without using any digital platforms, a second control group that received the same instruction but used a

non-gamified Moodle platform, and the experimental group that received the same instruction and used the gamified Moodle platform during six weeks. Using a mixed methods research design, he combined quantitative pre-test and post-test data with qualitative semi-structured interview data. He found that learners in the experimental group had significantly higher scores in terms of engagement than those in the two control groups. Furthermore, analysis of covariance (ANCOVA) results revealed that the experimental group had significantly higher vocabulary post-test scores than the two control groups. The semi-structured interviews showed that learners found gamification effective, engaging, interesting, motivating, and enjoyable. Overall, the study demonstrated that gamification had a positive effect on learner engagement and vocabulary learning.

Another study investigating the use of gamification in a university in Türkiye was conducted by Ertürk (2023). In this quasi-experimental mixed methods research study, he investigated how individual and collaborative gamification affected vocabulary learning by assigning 47 EFL learners to one of the three groups: a control group, an experimental individual gamification group, and a second experimental collaborative gamification group. Over the course of three weeks, the control group completed paper-based activities while the experimental groups completed their gamified versions. In order to assess learners' vocabulary development over time, he administered a pre-, post-, and delayed post-test. Moreover, he used a questionnaire to explore the opinions of learners in the experimental groups. Using mixed-design ANOVA, he found that the experimental groups had significantly higher scores than the control group in the post- and delayed post-test, with no significant differences between the experimental groups in the tests. He further found that although there were no significant differences between the post- and delayed post-test scores of control and individual gamification group, the collaborative gamification group had significantly higher scores in the delayed post-test with regard to meaning recall than the post-test. The thematic analysis results for the questionnaire further revealed that the learners found gamification more effective, engaging, motivating, and enjoyable than

traditional paper-based activities. Furthermore, the results showed that most learners in the collaborative gamification group stated that they would prefer collaborative gamification over individual gamification as the former enabled them to learn from each other, while a minority of them reported that they would prefer individual gamification as they needed more time to answer the questions before others did. Overall, the study demonstrated that gamification was more effective than traditional methods in terms of vocabulary learning and retention, and it increased learners' engagement and motivation.

It has been reported by previous research syntheses that most studies in gamified language learning over the past two decades have focused on secondary education and higher education, with least commonly used samples being elementary students or lower levels (Dehghanzadeh et al., 2019; Dehganzadeh & Dehganzadeh, 2020), meaning that young learners are underrepresented. Moreover, Acquah and Katz (2020) found in their systematic literature review that most studies conducted on digital game-based L2 learning was conducted with university students for convenience, and that future studies need to work with younger learners as English learning begins in primary school. Therefore, there is a definite need to investigate the role of digital gamification in young EFL learners' vocabulary learning process.

In their qualitative study, Turgut and İrgin (2009) investigated the effect of online computer games on young EFL learners' English language learning experiences, with specific reference to vocabulary and pronunciation. With this aim, they collected data from 10 primary and secondary school students who played various online games in internet cafes in Türkiye. Data were collected through three observations, with each lasting two hours, and semi-structured interviews. The phenomenological data analysis revealed that online games enabled learners to develop effective vocabulary learning strategies and provided constant exposure to L2 vocabulary through repetition, which allowed them to practice the unknown vocabulary items and figure out their meaning based on the words they already know. Furthermore, the findings demonstrated that online games increased

their motivation to learn vocabulary, and that they had control over the activities, being aware of the advantages and disadvantages of online games.

In order to investigate the effect of digital games on young EFL learners' vocabulary learning, Aghlara and Tamjid (2011) assigned 40 learners aged between 6 and 7 to the experimental group that used a digital computer game and to a control group that used traditional methods to learn vocabulary over a period of 45 days. At the end of the intervention, they administered a final vocabulary test to the learners. The results of the test indicated that the learners in the experimental group significantly outperformed those in the control group. As a result, they concluded that digital games had a positive effect on young EFL learners' vocabulary learning.

Liu et al. (2024) investigated the effect of digital gamification on EFL learners' language vocabulary and grammar achievement, enjoyment, and ideal L2 self by employing a sequential explanatory mixed methods research design. With this aim, they randomly assigned 36 young EFL learners aged between 11 to 13 years old into a digital class where they completed digitally gamified learning activities and received digital feedback, and a non-digital class, where they performed completed the same activities in printed format and received non-digital feedback. The quantitative data were collected through tests and scales while the qualitative data were collected through semi-structured interviews. One-way ANCOVA showed that the learners in the digital class significantly outperformed those in the non-digital class in all the measures with regard to achievement, enjoyment, and ideal L2 self. Furthermore, thematic analysis revealed that learners had positive attitudes towards digital gamification since it enhanced their motivation and enjoyment, increased their confidence, made learning less stressful, boosted collaboration, and encouraged autonomous learning. Negative attitudes and perceptions included challenges such as being exposed to a limited range of content and lacking sufficient interaction and feedback.

Young and Wang (2014) developed a Game Embedded CALL (GeCALL) system and investigated its effect on English vocabulary acquisition and pronunciation. They

assigned 52 4th grade young learners enrolled in an elementary school in Taiwan to an experimental group who used drilling and game-based activities that had four-level barriers that could be passed by choosing the correct vocabulary item from three candidate answers and pronouncing it correctly, and to a control group who used only the drilling activities that only provided immediate scores and feedback. The experimental group also needed to collect four colors of medals to complete the game, and earned one virtual medal as reward for completing each of the four levels. Both groups took a paper-based vocabulary pre-test and a pronunciation pre-test, observation forms were filled out by observers based on the evaluation of learners' motivation, involvement, and interaction, and both groups took a vocabulary post-test and pronunciation post-test at the end of the 8-week intervention. Furthermore, they developed a questionnaire to evaluate learners' motivation and attitudes. They also conducted a semi-structured interview with 15 participants to explore their experiences. Finally, both groups took a delayed vocabulary retention test 1 week after the post-test. The results of the analysis showed that although the experimental group significantly outperformed the control group in terms of pronunciation, the control group had a higher mean score than the experimental group in the delayed vocabulary retention test. The questionnaire results indicated that learners had positive attitudes towards game-based vocabulary and pronunciation learning and an enhanced level of motivation. The observations and interviews further revealed that learners in the game-based group had a good level of interaction with each other, and that a few of them found game-based learning challenging and very few of them showed anxiety. Overall, they concluded that although game-based methods increased learners' motivation and performance in terms of pronunciation, traditional teaching methods were more effective in facilitating vocabulary retention.

In order to investigate the effect of digital games on teaching vocabulary to young learners as compared to traditional pen and paper practices, Hazar (2020) conducted an experimental study with 37 3rd grade young EFL learners aged between 8 and 9 who took

80-minute English classes per week in a primary school in Türkiye. With this aim, she assigned the participants to an experimental group that used the digital games on EBA (Education Informatics Network) and a control group that did not use them. Over the course of 4 months, both groups were taught the regular curriculum while the experimental group additionally used various digitally gamified activities. The researcher collected the data through pre- and post-tests. The independent samples t-test results indicated that although the groups did not significantly differ from each other in the pre-test, the experimental group significantly outperformed the control group in the post-test, concluding that digital games had a significant positive effect on young EFL learners' vocabulary learning.

Overall, the studies presented indicate that gamification has a positive effect on EFL learners' language skills, motivation, and engagement. However, the use of digital gamification in young EFL learner classrooms is still a growing area of research. Therefore, this study aims to contribute to this growing area of research by investigating whether digital gamification improves young learners' vocabulary as compared to young learners who participate in comparable vocabulary instruction without any kind of gamification.

Chapter 3

Methodology

The third chapter of the thesis is concerned with the methodology regarding the type of research, participants, ethical considerations, data collection, instruments, reliability and validity, research context, the implementation of the study and the treatment procedure, and data analysis. Overall, the methodology used in this quasi-experimental study is mixed methods research based on both quantitative and qualitative data collection, analysis, and interpretation.

Type of Research

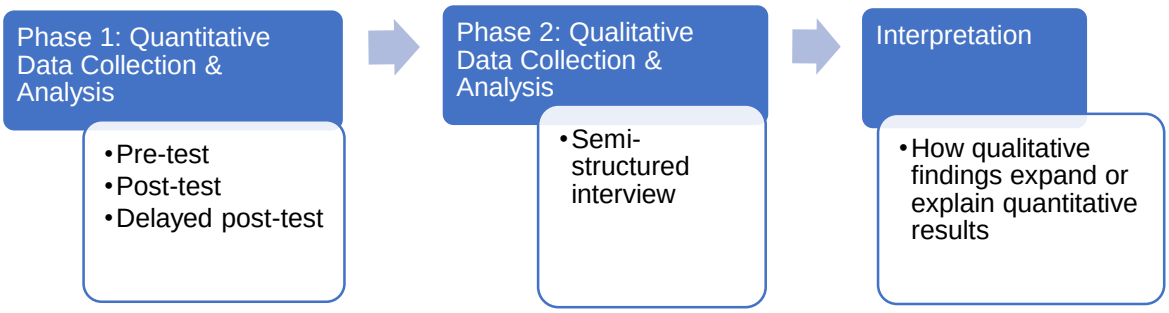
The research methodology used in this study is mixed methods research based on the collection, analysis, and integration of both quantitative and qualitative data. The rationale behind the selection of this type of research approach is, as stated by Creswell and Creswell (2018), that a combination of quantitative and qualitative data yields a deeper insight into the research problem and questions than either type alone. In the context of classroom research, for example, the fact that quantitative methods typically do not explore how and why learning takes place in a classroom setting necessitates the use of qualitative methods that reveal learners' interpretations (Dörnyei, 2007, p. 187; Turner & Meyer, 2000). Moreover, since both quantitative and qualitative data offer different types of information and have their own weaknesses and strengths, the weaknesses can be neutralized and the limitations of the study can be minimized through the integration of the strengths of each form of data (Creswell & Creswell, 2018). Thus, a mixed methods design enables researchers to both generalize the results of the study to a population and explore the detailed views of the participants (Creswell & Creswell, 2018). In this regard, Greene et al. (1989) developed a conceptual framework for mixed methods research and identified five purposes for mixed methods designs: a) *triangulation*, which refers to the convergence of results from multiple methods or forms of data, b) *complementarity*, which refers to the

enhancement of results as a result of combining different methods, c) *development*, which refers to the consequent use of methods, d) *initiation*, which refers to the discovery of various contradictions and perspectives, and e) *expansion*, which refers to broadening the scope of research. In light of all that has been mentioned so far, this thesis will use mixed methods to provide a more comprehensive understanding of the research questions by gathering and analyzing data from different sources.

Creswell and Creswell (2018) suggested that there are three major types of mixed methods research design: a) *the convergent design*, which compares and converges quantitative and qualitative results after collecting both forms of data simultaneously, b) *the explanatory sequential design*, which first collects and analyzes quantitative data and then seeks to further explain the results with qualitative data, and c) *the exploratory sequential design*, which first collects and analyzes qualitative data, and then, building on the results, conducts the quantitative phase of the study. In this thesis, the explanatory sequential mixed methods design was adopted to interpret the quantitative results in more detail with the help of qualitative results. Therefore, this current study begins with a quantitative phase, in which a vocabulary test is administered, and then follows up with a qualitative phase, in which a semi-structured interview is conducted to enhance the quantitative results (see Figure 7).

Figure 7

Explanatory Sequential Design



This thesis is an experimental research that aims to determine if digital gamification has an effect on young EFL learners' vocabulary learning. In order to assess this, the researcher provided digital gamification to the experimental group and withheld it from the

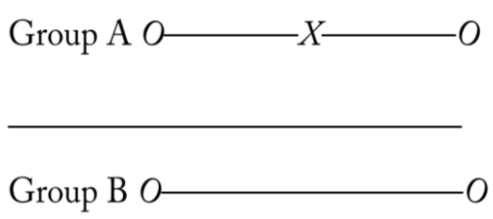
control group and investigated how each group scored on the vocabulary test. Since the participants were in pre-existing classes, it was not possible to conduct a true experiment by randomly assigning each participant to groups, and instead, the researcher randomly assigned each class to the experimental or control group. Therefore, this current study is quasi-experimental as it uses nonrandomized assignment of participants to the experimental group and control group.

As stated by Campbell and Stanley (1963), the similarity of the experimental and control groups needs to be considered in their recruitment, and that this similarity can be confirmed by their pre-test scores. With this in mind, in order to ensure that the groups did not have significant differences at the beginning of the study, classes were randomly assigned to either the experimental group or control group and their pre-test scores were compared. In other words, although each participant did not have an equal chance of being assigned to the groups, each class did. This random assignment of pre-existing groups to different conditions is referred to as cluster random assignment, which is used when individual random assignment is unfeasible or not possible (Blair et al., 2023).

One of the most widely used experimental designs in the field of education is the nonequivalent control group design since classrooms are naturally constructed clusters (Campbell & Stanley, 1963). Although the classes included in the study had similar characteristics, this study also adopted a nonequivalent control group pretest-posttest design since the individual participants were still not randomly assigned to the groups.

Figure 8

The Nonequivalent Pre-test and Post-test Control-Group Design



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In the nonequivalent pre-test and post-test control-group design, as illustrated by Creswell & Creswell (2018) (see Figure 8), first, the experimental group (Group A) and the control group (Group B) are selected using nonrandom assignment (which is represented by the horizontal line between the comparison groups), then, both take a pre-test (O), after that, only the experimental group is exposed to the treatment (X), and finally, both take a post-test (O) (p. 235). The current study also included a delayed post-test to assess long-term vocabulary retention.

Research Population and Sample

The study consists of a pilot study and a main study. In this study, the population consists of all 4th graders that learn English as a foreign language in Türkiye. Since it is next to impossible to access the target population, a sample of the population was taken and studied. In order to access the participants easily, convenience sampling, which is a non-probability sampling method, was used. The study was conducted during the 2023-2024 Academic Year in two public primary schools, one for the pilot study and one for the main study. The reason why the schools were selected is that the teachers in these schools stated that they had never used any kind of gamification in their classes before, ensuring that withholding it from the students in the control group would not have any negative impact on their learning process. Since the teachers did not have any experience with gamification, the researcher provided both online and in-class training sessions prior to the treatment.

A pilot study was conducted prior to the main study in order to test its feasibility, eliminate the weaknesses, test the appropriateness of the instruments and data collection process, and make the necessary changes accordingly. A total of 271 4th graders aged between 10 and 11 years enrolled in a primary school in Konya, a city in Central Anatolia in

Türkiye, were recruited for the pilot study. The 4th grade students are at A1 level based on CEFR, the Common European Framework of Reference for Languages (CoE, 2001; T.C. Milli Eğitim Bakanlığı [Republic of Türkiye Ministry of National Education (MoNE)], 2018), and they have a 2-hour English class per week. For the main study, a total of 142 4th graders aged between 10 and 11 years enrolled in a primary school in Konya were included. The students also took 2-hour English classes on a weekly basis, and the study was conducted over a period of six months.

In regard to ethical considerations, the study procedures were approved by Hacettepe University Social Sciences and Humanities Research Ethics Board and Konya Provincial Directorate of National Education and the participants were provided written informed consent forms prior to participating in the study. The consent forms were also obtained from the teachers and students' parents. The inclusion criteria for participants were reading and filling in the written informed consent forms, and the exclusion criteria were withdrawing from the study at any time.

Since the students were already in pre-existing classes, it was not possible to carry out the assignment procedure at the individual level. In order to overcome this unfeasible nature of individual level assignment pertaining to intact classes, Blair et al. (2023) suggested that cluster random assignment is practical to conduct at school-level designs. Therefore, the researcher used cluster random assignment, in which all students within the intact classes were randomly assigned to either the experimental group or control group and thus either received or were withheld from the treatment. The reason why intact classes of students were selected instead of individual students is that the former provides deeper insights into learners' experiences regarding curriculum and instruction, which typically take place in an existing classroom setting (LaRoche et al., 2020).

The participants were divided into two groups: the experimental group and control group, each consisting of three classes that were randomly assigned to the experimental or control group. The students in the experimental group received the digital gamification

treatment while the students in the control group maintained their traditional methods for learning vocabulary that did not include any kind of gamification.

Data Collection

The quantitative and qualitative data in this thesis were collected from two main sources: the vocabulary test and semi-structured interview. Both the vocabulary test and the semi-structured interview form were developed by the researcher. The researcher consulted five field experts for each and made the necessary changes according to their opinions and feedback. Moreover, both of the data collection tools were piloted prior to conducting the main study to evaluate their reliability, validity, and practicality. Since this study adopted an explanatory sequential mixed methods design, the data collection process occurred in two phases: the quantitative phase and qualitative phase respectively. The quantitative data collection occurred at three points in time including the pre-test, post-test, and delayed post-test, and the qualitative data collection was conducted in different sessions at the end of the study.

Instruments

The vocabulary test and semi-structured interview had been developed by the researcher, tested for their validity and reliability at another primary school, and validated by field experts before they were used in the main study. Since this study consisted of two distinct phases (i.e., the quantitative phase and the qualitative phase respectively), the vocabulary test, which is a quantitative data collection instrument, was used in the first phase, and the semi-structured interview, which is a qualitative data collection instrument, was used in the second phase of the study.

Vocabulary Test

Quantitative data were collected by means of a vocabulary test that was prepared by the researcher. According to Nation (2001), a good vocabulary test should contain plenty

of items and various types of assessment. In this regard, the test contained 40 main items and had 3 sections: multiple choice with 15 items, matching with 5 main themes consisting of 6 items each, and fill-in-the-blanks with 20 items. Overall, the total number of items when the matching sub-items were also included was 65. Taking into consideration their degrees of difficulty, the multiple choice section was awarded a total of 30 points, with 2 points for each item; the matching section was awarded a total of 30 points (5x6), and the fill-in-the-blanks section was awarded a total of 40 points, with 2 points for each item. The multiple choice section included 3 items per unit, and each item contained 4 options. The matching section included 5 themes with 6 items and 9 options for each unit. The reason why there were 3 extra options was to minimize the risk of guessing the correct answer by chance. Finally, the fill-in-the-blanks section contained 20 pictures and sentences with missing words. Although the first two part of the test was developed in order to measure young learners' receptive vocabulary knowledge, the last part aimed to assess their productive vocabulary knowledge since no options were provided. The maximum number of points possible was 100 and the lowest one was 0.

When constructing a test for young learners, it is important to use a lot of pictures (Mehrens & Lehmann, 1991). In this regard, the researcher selected images that are colorful and easily understandable to avoid any confusion. The images were copyright-free and selected from Adobe Stock and Freepik, search engines that enables users to find stock contents, images, audio, and videos (Adobe Stock, n.d.; Freepik, n.d.). For the current study, the researcher selected cartoons and illustrations in order to appeal to the test takers' (i.e., young learners') interests.

Since young learners have a short attention and retention span, it is important to put the blanks near the end of the sentence while designing fill-in-the-blanks items (Mehrens & Lehmann, 1991). Although it was not possible for all of the fill-in-the-blanks items due to word order, the researcher placed the blanks near the end of the sentence in most of the items.

The vocabulary items to be included in the test were determined based on the words contained in the units of *Cartoon Characters*, *Free Time*, *My Day*, *Fun with Science*, and *Jobs* in the students' book prepared by Akseki et al. (2022) and using an online corpus tool for finding out the most frequently used ones. For this reason, the researcher used AntConc (Anthony, 2023), a corpus analysis software enabling researchers to search for the Key Word in Context (KWIC), collocates, word frequencies, identify the counts of tokens (i.e., the total number of words) and types (i.e., the number of unique words), and create clusters, n-grams, and word clouds.

In order to search for the word frequency lists, the researcher created a text file for each unit by writing all of the words included. Then, the researcher loaded these corpora into AntConc 4.2.4. to create word frequency lists for each unit. Since it was not possible to include all the words in the vocabulary test, the researcher selected only those words with a minimum frequency of three, and excluded the remaining words with lower frequencies. Figure 9 shows a sample word frequency list created for the unit Fun with Science and Figure 10 illustrates a sample word cloud created for the unit Jobs.

Figure 9

Sample Word Frequency List

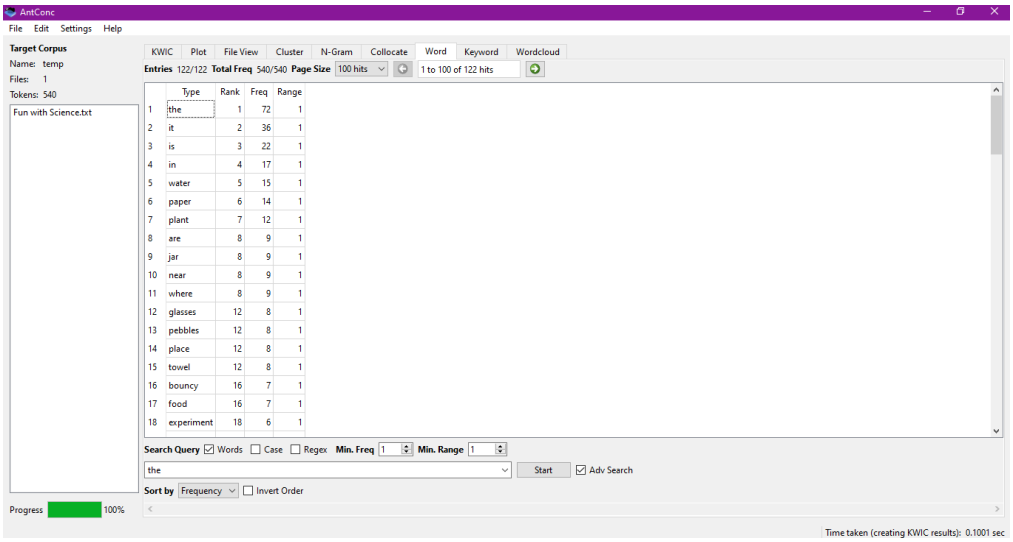
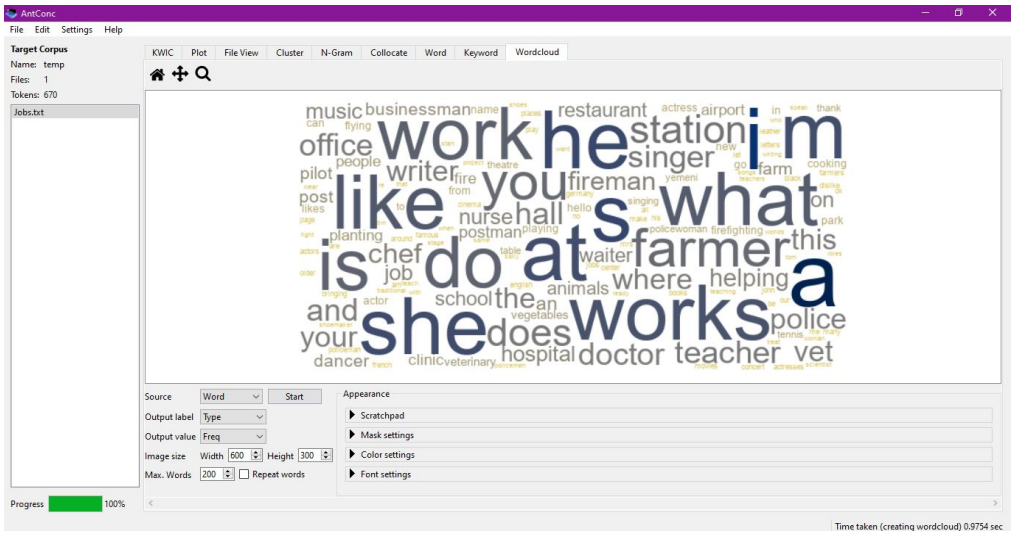


Figure 10

Sample Word Cloud



The purpose of the vocabulary test was to investigate whether the digital gamification treatment had an effect on young EFL learners' vocabulary learning. With this aim in mind, the researcher used the same vocabulary test in the pre-test, post-test and delayed post-test phases. There are possible threats to internal validity with regard to the experimental procedures that need to be minimized since they may have a negative impact on the ability of experimenters to draw accurate inferences from the data regarding the target population (Creswell & Creswell, 2018). In the current study, for instance, the reason why the researcher administered the same instrument for these measures was to address instrumentation, which is a threat to internal validity that might arise when a different instrument is used for the pre-test and post-test, which affects the scores on an outcome (Creswell, 2012; Creswell & Creswell, 2018). In order to address testing, which is another threat to internal validity that arises when the participants develop some familiarity with the outcome measure, and thus, remember their responses for the test, the researcher provided a longer time interval between the administrations of the tests (Creswell, 2012; Creswell & Creswell, 2018). This threat is also referred to as the practice effect, which takes place when repeated testing in an experimental study leads to an improvement in learners' performance just because they have gained experience in taking the specific test (Dörnyei, 2007, p. 53).

The test was administered to both the experimental and control group as a pre-test in order to determine whether the groups were similar prior to the treatment. After the treatment period, the learners in both groups completed the post-test. Finally, six weeks after the post-test, the researcher administered the delayed post-test to measure vocabulary retention.

Reliability and Validity of the Vocabulary Test. According to Dörnyei (2007), the only way for researchers to claim that their investigation is a disciplined inquiry is to have explicit quality standards to achieve. In this regard, Dörnyei (2007) divides the quantitative quality standards for research into three major parts: reliability, measurement validity, and research validity, which are elaborated on below with regard to the current study.

It is important to conduct pilot testing in order to measure the internal consistency (i.e., reliability) of the items through the Cronbach alpha statistic (Cronbach, 1951), establish validity, improve format, instructions, and items, and receive feedback from the participants to make the necessary changes (Creswell & Creswell, 2018). Therefore, the researcher established the reliability and validity of the scores on the test after conducting a pilot test with a sample of 271 participants. Moreover, the participants' comments on the test were taken into consideration, and revisions regarding the instructions and extension of the duration of the test were made accordingly.

In order to establish reliability of scores on the test, which refers to the consistency of an instrument, the internal consistency of the test was measured. For instruments that consist of multiple items, the most important type of reliability is internal consistency, which assesses the intercorrelation between sets of items on an instrument that were designed to measure the same underlying construct (Creswell & Creswell, 2018). The internal consistency of an instrument is calculated using the Cronbach's alpha (α) value, which is used as an index of internal consistency by researchers that design tests to measure cognitive constructs such as student knowledge and understanding (Taber, 2018). In this regard, Cortina (1993) claims that Cronbach's alpha is one of the most important statistics in research with regard to constructing and using tests. Cronbach's alpha ranges from 0 to

1, and optimal values range between .7 and .9 (Creswell & Creswell, 2018, p. 215). The reason why the internal consistency was assessed for the current study instead of test-retest reliability, which is another type of instrument reliability, is that the latter may not be appropriate for educational research since it is usually quite difficult to measure the reliability of a knowledge test through repeated administrations as learners' experiences between the administrations constantly change (Taber, 2018). In regard to the acceptability of alpha value, George and Mallery (2003) provide a rule of thumb that is applicable to most situations (see Table 2) (p. 231).

Table 2

Cronbach's Alpha Value and Level of Reliability

Cronbach's Alpha Value	Level of Reliability
α > .9	Excellent
α > .8	Good
α > .7	Acceptable
α > .6	Questionable
α > .5	Poor
α < .5	Unacceptable

Note. Tabulated information from *SPSS for Windows step by step: A simple guide and reference* (4th ed., p. 231), D. George & P. Mallery, 2003, Allyn & Bacon.

In the current study, the reliability analysis of the vocabulary test that was developed by the researcher and administered in the pilot study (N= 271) was carried out through different measures of internal consistency (see Table 3) and using R Statistical Software (R Core Team, 2022). First, the Cronbach's alpha was calculated as 0.93 for the test. Since a Cronbach's alpha value of 0.9 or higher indicate excellent internal consistency, it can be stated that the test has high reliability. Furthermore, KR-20 and KR-21 (Kuder & Richardson, 1937), which can also be used to estimate internal consistency of a test with a single administration, were also calculated. Values for KR20 and KR21 also range from 0 to 1,

with 1 demonstrating perfect reliability. For short tests with 10-15 items, KR20 values of .5 are satisfactory while longer tests containing over 50 items require KR20 values to be of .8 or higher, with 1.0 being the maximum, in order to provide accurate estimates of reliability (Kehoe, 1994). For the vocabulary test, KR20 and KR21 were calculated as 0.93 and 0.91 respectively, which also shows that the test has high reliability. In general, Cronbach's alpha is used for both dichotomous and polytomous items while KR20 is used only for dichotomous items, and both measures can be used if the test items are scored as either correct or incorrect. Therefore, Cronbach's alpha and KR20 have different values with polytomous items that are given partial credit. The reason why they have the same value in the current study is that the items are dichotomous and thus are scored as correct or incorrect. In other words, the multiple choice items, matching items, and fill-in-the-blanks items in the vocabulary test are scored as either correct or incorrect based on consistent scoring rules. When the items have varying difficulty, KR20 is used to estimate reliability. When item difficulty is taken into consideration, KR20 can provide more accurate estimates than KR21 as the items in the vocabulary test have different levels of difficulty (see Table 7).

Table 3

The Reliability of Vocabulary Test Scores

Number of items	Number of respondents	Cronbach's alpha	KR-20	KR-21
65	271	0.93	0.93	0.91

A good test must contain items of moderate difficulty (i.e., neither too easy nor too difficult) so that it can be effective in discriminating between high- and low-achieving students (Ebel & Frisbie, 1991). A classification provided by Instructional Assessment Resources (IAR) (2011) based on item difficulty shows how certain ranges of difficulty can be interpreted (see Table 4).

Table 4

Index of Difficulty and Item Evaluation

Index of Difficulty	Item Evaluation
Above 0.90	Easy
Between 0.20 and 0.90	Moderate
Below 0.20	Difficult

Note. Adapted from *Instructional Assessment Resources*, 2011, The University of Texas Austin.

As for item discrimination, Ebel and Frisbie (1991, p. 232) stated that the best items are those with the highest discrimination index and provided a table for item evaluation based on indices of discrimination (see Table 5).

Table 5

Index of Discrimination and Item Evaluation

Index of Discrimination	Item Evaluation
0.40 and above	Very good items
0.30-0.39	Reasonably good but can be improved
0.20-0.29	Marginal items that can need improvement
Below 0.19	Poor items that should be rejected or revised

Note. Adapted from *Essentials of Educational Measurement* (5th ed., p. 232) by R. L. Ebel & D. A. Frisbie, 1991, Prentice-Hall. Copyright 1991 by Prentice-Hall.

In order to analyze the item difficulty (Pj) and item discrimination (Rj) with regard to the vocabulary test administered to the participants in the pilot study (N=271), R Statistical Software (R Core Team, 2022) was used (see Table 6).

Table 6

Item Difficulty and Discrimination Indices of the Vocabulary Test

Item	Pj	Rj	Item	Pj	Rj	Item	Pj	Rj

1	0,89	0,33	23	0,78	0,56	45	0,56	0,65
2	0,46	0,25	24	0,45	0,60	46	0,46	0,47
3	0,42	0,34	25	0,68	0,59	47	0,61	0,54
4	0,12	0,03	26	0,53	0,56	48	0,49	0,58
5	0,54	0,39	27	0,36	0,56	49	0,49	0,62
6	0,60	0,26	28	0,19	0,48	50	0,18	0,52
7	0,30	0,20	29	0,24	0,56	51	0,21	0,51
8	0,81	0,34	30	0,33	0,52	52	0,56	0,55
9	0,52	0,24	31	0,58	0,59	53	0,11	0,36
10	0,24	0,31	32	0,13	0,27	54	0,06	0,37
11	0,26	0,05	33	0,23	0,51	55	0,07	0,24
12	0,27	0,13	34	0,07	0,20	56	0,04	0,38
13	0,42	0,39	35	0,10	0,31	57	0,05	0,44
14	0,41	0,30	36	0,42	0,47	58	0,31	0,50
15	0,72	0,32	37	0,28	0,47	59	0,02	0,32
16	0,81	0,54	38	0,11	0,37	60	0,27	0,54
17	0,74	0,60	39	0,13	0,26	61	0,34	0,53
18	0,80	0,62	40	0,62	0,64	62	0,09	0,41
19	0,70	0,62	41	0,30	0,53	63	0,09	0,35
20	0,51	0,52	42	0,21	0,44	64	0,10	0,32
21	0,75	0,60	43	0,58	0,62	65	0,07	0,34
22	0,75	0,60	44	0,16	0,50			

In light of the classification provided by Instructional Assessment Resources (2011), an item difficulty table was prepared for the vocabulary test. Table 7 demonstrates that 46 out of the 65 items were found to be of moderate difficulty while 19 of them were found to be difficult.

Table 7

Item Difficulty Index of Items on the Vocabulary Test

Index of Difficulty	Frequency	Items	Evaluation
Above 0.90	0	-	Easy
0.20-0.90	46	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 29, 30, 31, 33, 36, 37, 40, 41, 42, 43, 45, 46, 47, 48, 49, 51, 52, 58, 60, 61	Moderate
Below 0.20	19	4, 28, 32, 34, 35, 38, 39, 44, 50, 53, 54, 55, 56, 57, 59, 62, 63, 64, 65	Difficult

In light of the table provided by Ebel and Frisbie (1991, p. 232), an item discrimination table was prepared with regard to the vocabulary test (see Table 8). Based on the table, 62 out of the 65 items (95.38%) were found to be acceptable while 3 of them were classified as poor.

Table 8

Item Discrimination Index of Items on the Vocabulary Test

Index of Discrimination	Frequency	Items	Evaluation
0.40 and above	37	16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 33, 36, 37, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 57, 58, 60, 61, 62	Very good
0.30-0.39	17	1, 3, 5, 8, 10, 13, 14, 15, 35, 38, 53, 54, 56, 59, 63, 64, 65	Reasonably good
0.20-0.29	8	2, 6, 7, 9, 32, 34, 39, 55	Marginal
Below 0.19	3	4, 11, 12	Poor

While analyzing items, poor performing items should be identified and reviewed based on certain criteria to find out whether the statistical results can be explained (Wood, 2020). With this in mind, the researched first classified items based on their level of difficulty. Most of the items in the vocabulary test (70.77%) were found to be of medium difficulty (N= 46) while some of them (29.23%) were classified as difficult (N= 19). The items that were found to be difficult were reviewed based on guidelines provided by Wood (2020) and Case and Swanson (1993): the answer key was reviewed to ensure that the items were scored correctly, the wordings of the items were checked to ensure that they were well written, the options were reviewed to ensure that there was only a single best answer to the items and that the other options did not apply, the items were reviewed to ensure there were no grammatical or logical cues or other ambiguities that would lead the learners to choose a wrong option, feedback was received from the learners, knowledgeable faculty members were asked to answer the items without looking at the options, and it was confirmed that the items were testing the objectives to be covered in the course. Since these checks did not provide an obvious reason for the items being difficult, their discrimination indices were checked. In this regard, Wood (2020) suggested that if the discrimination index of an item with a high level of difficulty is above 0.10, the item is likely acceptable as higher-scoring learners tended to answer it correctly even though it was difficult. As Mehrens and Lehmann (1991) also stated, it is desirable for each item in a test that a larger proportion of higher-scoring than lower-scoring learners can answer it correctly. If the item has a discrimination index of between 0 and 0.09, however, the item may need to be removed, revised by a content expert, or kept on the examination provided that it is crucial and relevant to the course, and no issues relevant to its content or structure are identified (Wood, 2020). As stated by Mehrens and Lehmann (1991), what is more important for a test than its level of difficulty is to have adequate content validity in the long run. Based on these criteria, most of the items that were determined to be difficult (N= 18) were determined to be acceptable as they had a discrimination index above 0.10 while one of them, item 4 (I-CVI = 1), was flagged as poor performing (Pj= 0,12; Rj= 0,03). Since item 11 (I-CVI = 0.60) and 12 (I-CVI

= 0.80) also have an index of discrimination below 0.19, they were also flagged as poor performing, regardless of their moderate level of difficulty, and reviewed based on the above criteria.

Another crucial quality standard for measurement is validity. There are four major forms of measurement validity in research: a) *face validity*, which evaluates whether the test appears to measure what it was intended to measure, b) *content validity*, which evaluates how well the test items measure the content they were designed to measure, c) *criterion (predictive/concurrent) validity*, which evaluates how accurately the test scores predict the criterion measure or correlate with scores from another valid test, and d) *construct validity*, which evaluates how well the test measures the hypothetical constructs or concepts they were intended to measure (Creswell & Creswell, 2018, p. 215; Kumar, 2011, p. 179). In order for face validity and content validity to be ensured, each item should be logically linked with the objectives of a study, and the items should cover the full extent of the content respectively (Kumar, 2011). For the vocabulary test, face validity and content validity were established, as explained below.

In order to ensure face validity and content validity of the test, the researcher first prepared a table of specifications based on the items that are linked to specific units, themes, and learning outcomes. In regard to the construction of learning outcomes, Bloom's Taxonomy (Bloom, 1956), which consists of the major categories of *knowledge* (i.e., remembering), *comprehension*, *application*, *analysis*, *synthesis*, and *evaluation*, was taken into consideration. In the vocabulary test, the first class, knowledge of terminology (1.11.), which includes the knowledge of vocabulary, terms, and meanings, was adapted for the multiple-choice, matching, and fill-in-the-blanks items, which require learners to recall, recognize, distinguish, identify, match, or write the vocabulary items. Since it is important that the content coverage is balanced (i.e., each aspect should be represented similarly and adequately in the items) (Kumar, 2011), in establishing content validity, the researcher constructed an equal number of items per unit. Furthermore, the researcher created a table

of specifications to associate the items with the learning outcomes based on the curriculum prepared by the MoNE (2018) (see Table 9).

Table 9

Table of Specifications

Units / Themes	**Items**
Cartoon Characters / abilities and inabilities	Section A: 1, 2, 3 Section B: 1 Section C: 1, 2, 3, 4
Free Time / likes and dislikes, free time activities	Section A: 4, 5, 6 Section B: 2 Section C: 5, 6, 7, 8
My Day / daily routines, time and days	Section A: 7, 8, 9 Section B: 3 Section C: 9, 10, 11, 12
Fun with Science / instructions, materials, and locations	Section A: 10, 11, 12 Section B: 4 Section C: 13, 14, 15, 16
Jobs / workplaces, jobs and likes	Section A: 13, 14, 15 Section B: 5 Section C: 17, 18, 19, 20
Learning outcomes	**Items**
1. Students will be able to choose the correct vocabulary item based on the textual and visual context.	Section A
1.1. Students will be able to choose the correct vocabulary item about the abilities and inabilities of the self and others.	1, 2, 3
1.2. Students will be able to choose the correct vocabulary item about likes and dislikes.	4, 5, 6
1.3. Students will be able to choose the correct vocabulary item about the time and days.	7, 8, 9
1.4. Students will be able to choose the correct vocabulary item about instructions and locations.	10, 11, 12
1.5. Students will be able to choose the correct vocabulary item about other people's jobs and workplaces	13, 14, 15

2. Students will be able to match vocabulary items with corresponding pictures.	Section B
2.1. Students will be able to match activities related to abilities and inabilities with corresponding pictures.	1
2.2. Students will be able to match free time activities with corresponding pictures.	2
2.3. Students will be able to match daily activities with corresponding pictures.	3
2.4. Students will be able to match materials for science experiments with corresponding pictures.	4
2.5. Students will be able to match jobs with corresponding pictures.	5
3. Students will be able to complete sentences using the correct vocabulary items based on visuals.	Section C
3.1. Students will be able to complete sentences using the correct vocabulary items related to abilities and inabilities based on visuals.	1, 2, 3, 4
3.2. Students will be able to complete sentences using the correct vocabulary items related to free time activities based on visuals.	5, 6, 7, 8
3.3. Students will be able to complete sentences using the correct vocabulary items related to daily activities based on visuals.	9, 10, 11, 12
3.4. Students will be able to complete sentences using the correct vocabulary items related to locations of objects based on visuals.	13, 14, 15, 16
3.5. Students will be able to complete sentences using the correct vocabulary items related to workplaces based on visuals.	17, 18, 19, 20

In order to assess content validity, a minimum of three experts should be asked to rate each item (Lynn, 1986; Polit & Beck, 2006). The researcher consulted five field experts about the appropriateness of the test for young learners, the clarity of the instructions and format, the difficulty of the items, and scoring. In order to ensure test content validity, the five experts evaluated the relevance of each item to units and learning outcomes and the representativeness of the items with regard to the content using a 4-point scale, where 1

referred to inappropriate, 2 referred to somewhat appropriate, 3 referred to quite appropriate, and 4 referred to highly appropriate. The reason why a 4-point scale was used instead of a 3- or 5-point one was to avoid a neutral and ambiguous midpoint (Lynn, 1986; Polit & Beck, 2006). The scores obtained from the experts were used to compute the Content Validity Index (CVI), which measures the degree to which an instrument has content validity. CVI can be used to calculate the content validity both for individual items (I-CVI) and for the overall scale (S-CVI) (Lynn, 1986; Polit & Beck, 2006). The I-CVI is calculated by dividing the number of experts who rated the item 3 or 4 by the total number of experts while S-CVI/Ave can be calculated by summing the I-CVIs and dividing by the number of items (Polit & Beck, 2006, pp. 491-492). According to Shi et al. (2012), it is recommended that a scale that has excellent content validity should contain I-CVIs of 0.78 or higher and S-CVI/Ave of 0.9 or higher. Based on this, the analysis revealed that all items except item 2 (I-CVI = 0.60), item 11 (I-CVI = 0.60), and item 13 (I-CVI = 0.60) had an I-CVI higher than 0.78, and the test had a S-CVI/Ave of 0.95, indicating that it has a good level of overall content validity. Since the three items had an I-CVI lower than 0.78, these items were revised.

The Semi-Structured Interview

In order for teachers and researchers to keep up with learners' changing needs by learning as much as possible about their needs, interests, and ideas, asking them about their views and opinions is of high importance (Pinter, 2017). Learners' views can be gathered through questionnaires and interviews. Since questionnaires usually require a good level of literacy, young learners may become confused and thus misunderstand questions, and the amount of thinking and writing may be time consuming and exhausting for them (Pinter, 2017). Therefore, conducting an interview can be a better alternative when working with young learners. Interviews can be classified into three main types based on the degree of structure as follows: a) *structured interviews* that involve highly controlled questions with very little flexibility, b) *unstructured interviews* that involve non-directive

questions with great flexibility, and c) *semi-structured interviews,* which is an intermediate between the two extremes that both provides guidance and direction and enables interviewees to elaborate on certain topics (Dörnyei, 2007, p. 135). In order to gain a deeper understanding of the effect of digital gamification on young EFL learners' vocabulary learning process through broad questions about the topic but not limited response categories, the researcher developed a semi-structured interview form containing 8 main questions. Before the interview, the researcher gave an explanation of the aim of the interview to the participants and obtained written informed consent.

Before carrying out the interview with the participants in the main study, the researcher consulted five field experts about its validity, made the necessary changes accordingly, and piloted it in another primary school since it is important to elicit help from young learners themselves regarding an interview and assess whether the questions need to be phrased in other ways to facilitate understanding (Pinter, 2017). After the interview was piloted, the researcher made certain rearrangements with regard to duration and instructions to improve the interview. In order to ensure validity, the five experts were asked to rate each question on a scale from 1 to 4, with 1 referring to inappropriate, 2 referring to somewhat appropriate, 3 referring to quite appropriate, and 4 referring to highly appropriate based on its relevance to the study, clarity, content, and appropriateness for young learners. The results showed that the semi-structured interview had a S-CVI of 0.92, which indicated that it has a high level of validity (S-CVI > 0.9) (Shi et al., 2012). Furthermore, all questions in the interview had an I-CVI above 0.78, referring to a high level of validity (Shi et al., 2012). The researcher used convenience sampling to select the participants to conduct the interview with since it generally leads to willing participants, which enables researchers to have a rich dataset (Dörnyei, 2007). A common problem with interviews is that young learners may want to please the adult and answer the questions accordingly (Pinter, 2017). In order to minimize this social desirability bias (i.e., participants' desire to meet expectations), the researcher tried to construct the interview questions in a way that would

not influence their answers, and reassured that their identities would be protected. After that, the interview was conducted with the participants of the main study. In qualitative research or the qualitative phase of the mixed methods research, the sample size is not predetermined but rather determined during the data collection stage based on whether data saturation, a point where no or very little new information or themes emerge from the interview or they are negligible, has been reached or not (Kumar, 2011). The researcher conducted the interviews with 25 participants since the saturation point indicated that it was an adequate sample size.

The first question in an interview is particularly important as it acts as an ice breaker for interviewees by providing them with a comfortable and encouraging atmosphere in which they can feel competent (Dörnyei, 2007). In order to engage the learners in the interview, the researcher first asked them about what they liked most about digital gamification. The aims of the second question, which was about what they found challenging about digital gamification, were twofold. First, this question was asked since perceived ease of use is an important factor that has an impact on technology acceptance and usage (Davis, 1989). Thus, the first aim was to investigate the learners' attitudes towards the use of digital gamification tools. Second, the vast majority of optimal experiences take place when learners deal with challenging activities that require appropriate skills, efforts, and energy, which leads to a sense of enormous enjoyment (Csikszentmihalyi, 1990). A balance between boredom and anxiety is essential in order for individuals to experience flow state (Csikszentmihalyi, 1975, 1990), and games offer young learners the perfect balance because of the exciting elements it incorporates (Ham, 2020). In this sense, the second aim of this question was to explore whether there was a balance between the challenges of the digitally gamified activities and their skills. With this aim in mind, the researcher asked the learners about what they found challenging about the use of digital gamification tools and the whether the digitally gamified learning activities were difficult for them to complete with their skills.

As Sailer et al. (2017) advanced, specific game design elements found in gamification can promote learners' motivation and performance regarding a specific task by satisfying their intrinsic needs for competence, autonomy, and relatedness (Ryan & Deci, 2000b). Since gamification elements can lead to positive motivational outcomes, the third question contained 7 sub-questions as follows: points, leaderboards, badges, levels, rewards, time pressure, and feedback. The participants were asked how each element had an effect on their engagement in classroom activities. Since abstract words such as engagement and motivation can be challenging for young learners to understand, the researcher gave the example of raising their hands more in English lessons.

Since motivation plays an important role in gamification, the researcher intended to assess whether learning vocabulary with digital gamification provides young learners with inherent satisfactions and pleasure intrinsic to this type of learning process. With this aim in mind, the researcher formulated 8 sub-questions to address the central question related to intrinsic motivation based on the Intrinsic Motivation Inventory (IMI) (Ryan et al., 1991), which is a reliable and valid (McAuley et al., 1989) measurement tool developed by Ryan (1982) to assess individuals' personal experiences regarding a specific task including the following subscales:

- *Interest/Enjoyment*, which seeks to assess whether and in what ways individuals find a specific task fun, interesting, enjoyable, and intrinsically motivating
- *Perceived Competence*, which seeks to assess individuals' confidence and belief in their ability to carry out specific tasks compared to others
- *Effort/Importance*, which seeks to assess whether individuals think that a specific task requires a lot of effort and energy and whether it is important for them to do well at it

- *Pressure/Tension*, which seeks to assess the extent to which individuals feel anxious or relaxed while carrying out a specific task
- *Perceived Choice*, which seeks to assess whether individuals feel that they are in control of their own decisions with respect to a specific task
- *Value/Usefulness*, which seeks to assess the extent to which individuals find a specific activity valuable or beneficial for themselves
- *Relatedness*, which seeks to assess in what ways individuals form friendships and have social interactions with others while working on a specific task

(Center for Self-Determination Theory [CSDT], n.d.).

It is stated on the Center for Self-Determination Theory (CSDT) website that all academic use of the IMI is permitted and that researchers are allowed to modify the questions based on specific tasks and construct their own IMI using the questions that are related to their research questions (CSDT, n.d.). According to Pinter (2017), young learners may find it challenging to understand the complicated language used in questionnaires and get tired and bored in the process of reading and writing, which may take a lot of time. Moreover, it is important to provide young learners with a flexible environment in which they can open up and feel comfortable, relaxed, safe, and confident (Pinter, 2017). For these reasons, the researcher decided to conduct a semi-structured interview with the participants instead of administering a questionnaire. The semi-structured interview developed by the researcher included all of the subscales mentioned above: *Interest/Enjoyment* (a and b), *Perceived Competence* (c), *Effort/Importance* (d), *Pressure/Tension* (e), *Perceived Choice* (f), *Value/Usefulness* (g), and *Relatedness* (h), and adapted these for digital gamification. The reason why the subscale of *Interest/Enjoyment* has more questions is that it is the only subscale assessing intrinsic motivation by itself (CSDT, n.d.).

The fifth question was constructed to assess learners' sense of flow, which refers to the state in which individuals are so absorbed in the activity at hand that they lose the track of time while doing it for its own sake (Csikszentmihalyi, 1990). Furthermore, an initial investment of attention is a prerequisite for an activity to begin to be enjoyable, and thus, for reaching a state of flow (Csikszentmihalyi, 1998). Thus, this sense of total involvement directs learners' efforts and attention to the digitally gamified learning activities, without being distracted by anything else. Since the sense of flow may be challenging for young learners to understand, the researcher asked them about whether they had a state of intense concentration while carrying out digitally gamified learning activities.

In order to compare and contrast independent learning with collaborative learning, the researcher constructed the sixth question taking into consideration the sociocultural perspectives. Among these, Vygotsky's (1978) Zone of Proximal Development refers to the difference between what children can achieve individually and what they can achieve with the assistance of a more knowledgeable adult or "in collaboration with more capable peers" (p. 86). Thus, the ZPD emphasizes the importance of social interaction with more competent others in child development. Although the primary focus of this concept was on the interaction between adults and children, Tudge (1990) shifted the focus from adult-child interaction to peer-peer interaction and collaboration, stating that the effects of peer collaboration also need to be examined especially in classrooms where children work in groups to complete activities. He further maintained that it needs to be investigated whether children are as willing to accept their peers' opinion as they would if they interacted with an adult instead, and whether the peer-peer interaction is as effective as adult-child interaction with regard to cognitive development (Tudge, 1990). In order to investigate whether this is the case, the researcher asked the learners about their attitudes towards the digital gamification activities they played individually versus those they played in groups.

Finally, the last two questions were asked since the main aim of the current study is to investigate whether digitally gamified learning experiences have an effect on young EFL

learners' vocabulary learning and retention as compared to traditional learning methods. With this in mind, the researcher asked the learners whether digital gamification facilitated the learning and retention of vocabulary items as compared to the traditional non-gamified, non-digital, and non-digitally gamified methods. These two questions are of great importance since they enable triangulation, which contributes to the internal validity of the study by determining whether the quantitative and qualitative results converge.

When interviewing young learners, their first language will have to be used (Pinter, 2017). Taking into consideration the L2 proficiency level of the participants, their first language, Turkish, was used in the interview. The interviews lasted an average of 20 to 25 minutes for each interviewee and were conducted in the school's multipurpose hall. When some interviewees were distracted after a certain period of time, the researcher gave them a break and continued with others. After the break, she continued the interview with those interviewees from where they had left off. The interview was recorded on a digital audio recorder and transcribed manually.

Table 10 shows which data collection instruments were used to address each research question.

Table 10

Data Collection Instruments

Research Questions	Data Collection Instrument
What is the effect of digital gamification on young EFL learners' vocabulary learning?	Vocabulary post-test
What is the effect of digital gamification on young EFL learners' vocabulary retention?	Vocabulary delayed post-test
What are young EFL learners' opinions and attitudes towards using digital gamification in learning vocabulary?	Semi-structured interview

As shown in Table 10, the results of the vocabulary post-test and delayed post-test relate to the questions regarding the effect of digital gamification on young EFL learners'

vocabulary learning and retention respectively. On the other hand, the semi-structured interview provides a deeper insight into young EFL learners' attitudes towards the use of digital gamification in learning vocabulary in terms of challenges (question 2), gamification elements (question 3), intrinsic motivation (question 4), the flow state (question 5), individual versus collaborative vocabulary learning (question 6), and traditional versus digitally gamified vocabulary learning (question 7) and retention (question 8).

The Classroom Implementation

After piloting and testing the reliability and validity of the instruments and randomly assigning the pre-existing classes to the experimental and control group, the implementation of the main study started with the administration of the vocabulary test as a pre-test for both groups. The experimental group learned vocabulary through digital gamification while the control group maintained their traditional learning activities for learning vocabulary, which did not include any kind of gamification. It is important to note that neither of the groups had previously used digital gamification in their English classes prior to the intervention. In an experimental design, it is important to isolate the effects of the manipulation of one or more variables through "holding all other variables constant" in a study (Creswell & Creswell, 2018, p. 207). Therefore, in order to ensure that the only difference between the groups in terms of implementation is whether they receive digital gamification treatment or not, the digitally gamified activities that the experimental group used were turned into printable ones and administered to the control group without using any kind of digital platforms or gamification. At the end of the implementation process, a post-test was administered to both groups to investigate whether there were any significant differences between their scores. Furthermore, the delayed post-test was administered to investigate whether their scores differed significantly in the long term. Finally, the semi-structured interview was conducted to gain a better understanding of the effect of digital gamification.

The Digital Gamification Tools Used in the Study

In the implementation phase of the study, a variety of digital gamification tools and platforms were used, namely DİYALEKT KIDS, Busuu, Duolingo, Wordwall, LearningApps, Jeopardy (Factile), and Plickers. Each tool was selected based on various criteria including the characteristics of young language learners, their proficiency levels, the target vocabulary items, the gamification elements involved in the tools, and the accessibility, practicality, ease of use, and feasibility of the tools. Apart from these factors, the researcher selected each of these platforms based on their individual characteristics. DİYALEKT KIDS, for example, was selected because it consists of activities in line with the curriculum and students' book. Busuu and Duolingo were selected because they use AI adaptive technologies that employ a machine learning algorithm to provide learners with gamified AI, which is a combination of gamified learning and AI adaptive learning, tailoring content to learners' specific needs, weaknesses, and strengths. Wordwall, LearningApps, Jeopardy, and Plickers were selected because they enable users to create their own teaching resources, enabling the researcher to create various activities using the target vocabulary items. Another reason for selecting Jeopardy and Plickers was that they provide learners with collaborative and individualized gamification activities respectively. For the platforms that have pre-made activities (i.e., DİYALEKT KIDS, Busuu, and Duolingo), the researcher selected the ones that are in line with the target vocabulary items. On the other hand, for the platforms that enable users to create their own activities (i.e., Wordwall, LearningApps, Jeopardy, and Plickers), the researcher herself created a variety of activities with the target vocabulary items. After the teacher introduced the unit and explained the topic, the learners played the gamified activities for each unit. These included both receptive vocabulary activities such as multiple choice quiz games and matching words with pictures and productive ones such as filling in the blanks with the correct words according to pictures. These were selected and created based on target vocabulary and the question types were in line with those in the test. The printed versions given to the control group also included

the same vocabulary items and question types but were not gamified. In order for the integration of digital gamification in the classroom to be effective, the researcher provided both online and in-class training for the teacher and prepared a lesson plan including where and how she could access and use the tools, and which activities would be played for each unit and shared these with her. The first online training lasted 2 hours as an introduction to all tools, and then approximately 30 minutes of online training was provided for each unit. After receiving feedback from the teacher that she was ready to use the tools, the implementation process started. The researcher herself participated in the implementation at the beginning of each unit and assisted the teacher in the classroom when necessary. During the process, photographs and videos were taken to capture the dynamics.

DIYALEKT KIDS. As a digital language learning platform developed by the Republic of Türkiye Ministry of National Education, DİYALEKT was designed to provide individuals of all ages and proficiency levels with interactive learning experiences in which they can learn vocabulary, grammar, and pronunciation besides the four skills of English (T.C. Milli Eğitim Bakanlığı [Republic of Türkiye Ministry of National Education (MoNE)], n.d.). In regard to young language learners, DİYALEKT KIDS was designed to make their learning process more enjoyable and exciting through various activities including games, songs, cartoons, storybooks, and flashcards (MoNE, n.d.). Moreover, the games have a variety of visuals, sound effects, and gamification elements including stories, points, time pressure, progress bar, lives, and feedback (see Figure 11 for some examples).

Figure 11

Examples of Game Elements from Diyalekt KIDS

The reason why this digital learning platform was selected to be implemented in the study is that it includes various activity types based on the units included in *Learn with Bouncy 4* (Akseki et al., 2022) (see Figure 12), the students' book approved by the Republic of Türkiye Ministry of National Education for the use of 4th graders in primary schools in Türkiye. As a result, all the tasks are in line with the learning outcomes and target language skills mentioned in the English language curriculum prepared by the MoNE (2018) and the target vocabulary items in the students' book.

Figure 12

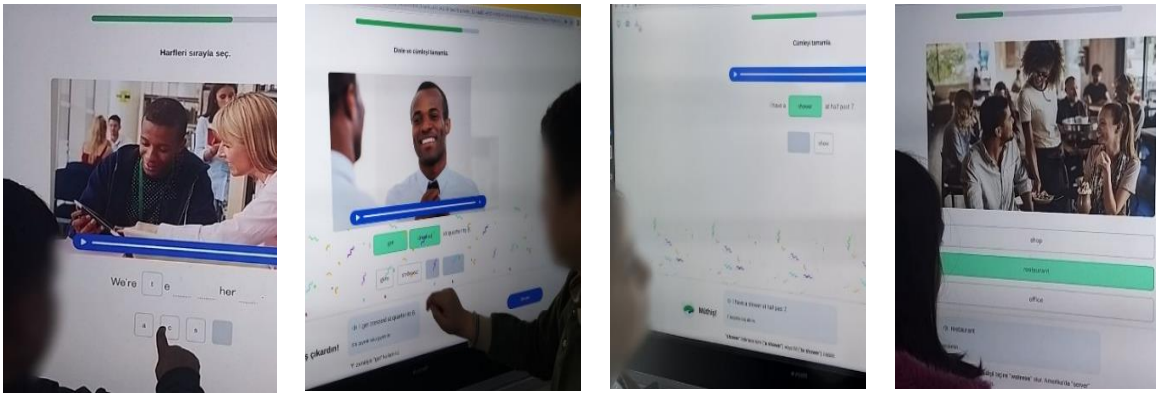
Examples of Activities in Diyalekt KIDS

In this study, two games were selected for each unit. The games were played after the unit was introduced for the first time in order to engage learners in the learning process. These games were as follows: *Cartoon Characters* and *Find Who* for the Cartoon Characters unit, *Likes and Dislikes Game* and *Speaking Show-Likes and Dislikes* for the Free Time unit, *Word Order-My Day* and *My Day* for the My Day unit, *Science* and *Fun with Science* for the Fun with Science unit, and *Robot OE-Jobs* and *Car Race-Jobs* for the Jobs unit. Since the units were in line with the units in students' books, each game provided learners with exposure to target vocabulary items.

Busuu. Busuu is an interactive language learning platform that uses gamified learning. In this study, the English course, which covers the first five steps of the CEFR, from A1 to C1 level, was selected. Since the participants in this study were at level A1, the implementation was limited to the Beginner level. Among the courses that Busuu offers, the Complete English course was selected in this study based on the target vocabulary. In this course, one section was selected for each unit, and the lessons to be completed in the classroom were selected based on the target vocabulary items of the study (see Figure 13 for some examples).

Figure 13

Examples of Activities from Busuu



One reason why Busuu was included in this study was that it allows learners to review any questions they have answered incorrectly, which enables them to correct their

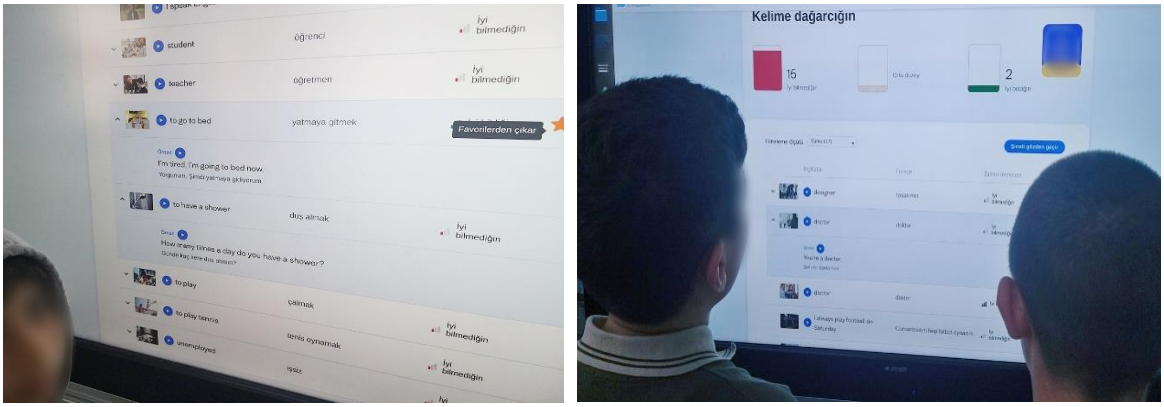
mistakes. Nation (2022) indicated that digital activities that provide spaced repeated encounters with vocabulary improves vocabulary learning and retention. In regard to vocabulary retention, Busuu enables learners to check whether they remember certain words and phrases they have learned throughout the lessons via the Vocabulary Trainer and the spaced repetition technique, which allows learners to revise the words at the most appropriate time intervals to enhance long-term vocabulary retention.

Another reason why Busuu was selected in this study was that it provides learners with AI adaptive learning. Since the trainer is AI-powered, it adapts to learners' learning behavior, patterns, and preferences and makes the learning process tailored for their unique characteristics by determining their individual strengths and weaknesses related to vocabulary (Marsden, 2023).

Furthermore, learners are provided with smart revisions through the spaced repetition technique, and the platform allows learners to save specific vocabulary items to the Favorites tab and practice them later (see Figure 14).

Figure 14

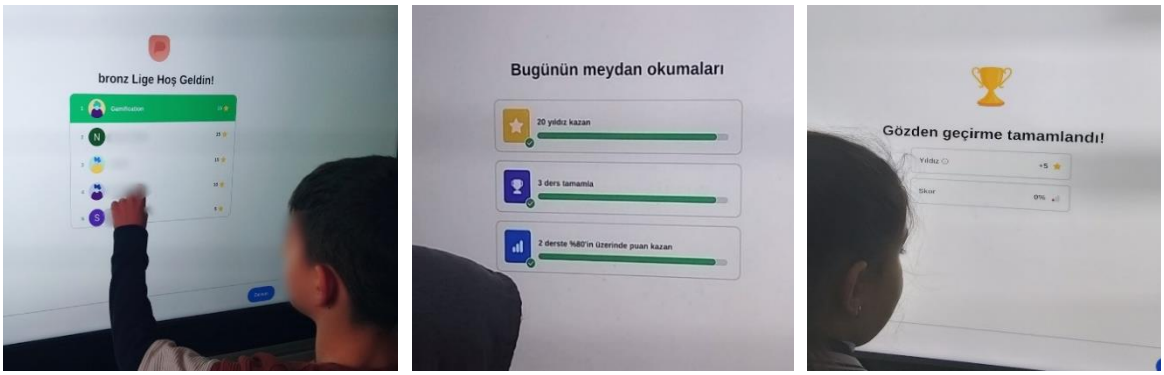
Busuu's AI-Powered Vocabulary Trainer



Finally, Busuu uses a variety of gamification elements including points, daily tasks, challenges, rewards, streaks, progression, immediate feedback, leaderboards, and progress bar (see Figure 15 for some examples of the game elements).

Figure 15

Examples of Game Elements from Busuu



Duolingo. Duolingo is a research-based gamified language learning platform that offers interactive, enjoyable and engaging courses to teach languages (Shortt et al., 2021). Duolingo is aligned with the CEFR to teach language skills and components, assessing how much learners know with regard to an international language standard. Similar to Busuu, Duolingo uses a Large Language Model (LLM), which is a type of AI algorithm. In this regard, Duolingo uses its own machine learning technology, *Birdbrain*, which is an AI model that adjusts the order and difficulty level of lessons based on each learner's proficiency level and specific needs based on the daily exercises that they complete (Bicknell & Brust, 2020). In this regard, Duolingo combines human experts and smart AI in designing curriculum, creating contents and activities, and personalizing lessons to maximize the quality of learners' learning experience (Pajak & Bicknell, 2022). Thus, it provides learners with personalized educational experiences by creating adaptive tests and activities that are tailored to each learner's weaknesses and strengths, and this is the major reason why it was selected for the current study.

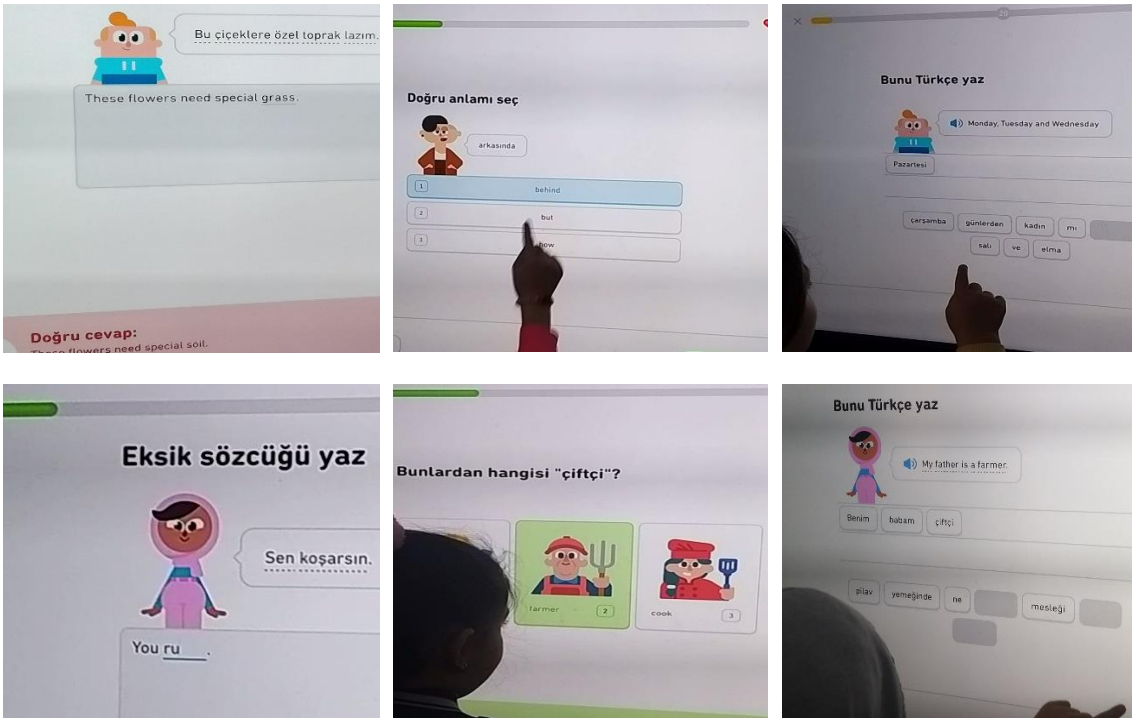
Regarding vocabulary learning and retention, Duolingo provides learners with contextualized learning and spaced repetition practices, which enable learners to practice previously learned vocabulary items by providing them with exercises that are the best match for them and allowing them to practice at the right time via Practice Weak Skills and Strength Meters buttons, which use algorithms similar to Busuu's Vocabulary Trainer.

Duolingo's spaced repetition algorithm is based on the idea that the best time for learners to review previously learned vocabulary items is when they are on the point of forgetting, in line with the forgetting curve proposed by Ebbinghaus (1885) (Settles & Meeder, 2016).

For the current study, Duolingo for Schools, an extension of Duolingo that enables teachers to track learners' progress, was used since it was conducted in a classroom setting. As the participants were level A1, the current study covered the first three sections, each of which is composed of lessons and crown levels. As the first level, the introduction level consists of image exercises and assisted recognition exercises while the following levels contain assisted production exercises, recall exercises, and unassisted production exercises, all of which are designed for reviewing and leveling-up (Rollinson, 2018). For this study, one subsection was selected for each unit, and the teacher allowed learners to complete review levels for each lesson as well as the introduction level in order to enhance their retention (see Figure 16 for some examples of the activities).

Figure 16

Examples of Activities from Duolingo



Finally, Duolingo for Schools was selected to be implemented in the current study as it uses a variety of gamification elements including points, levels, challenges, avatars, avatar customization, progress bar, classroom leaderboards, daily goals, achievements, power-ups, rewards, hearts, daily streaks, and immediate feedback (see Figure 17 and 18 for some examples of Duolingo's game elements).

Figure 17

Examples of Game Elements from Duolingo

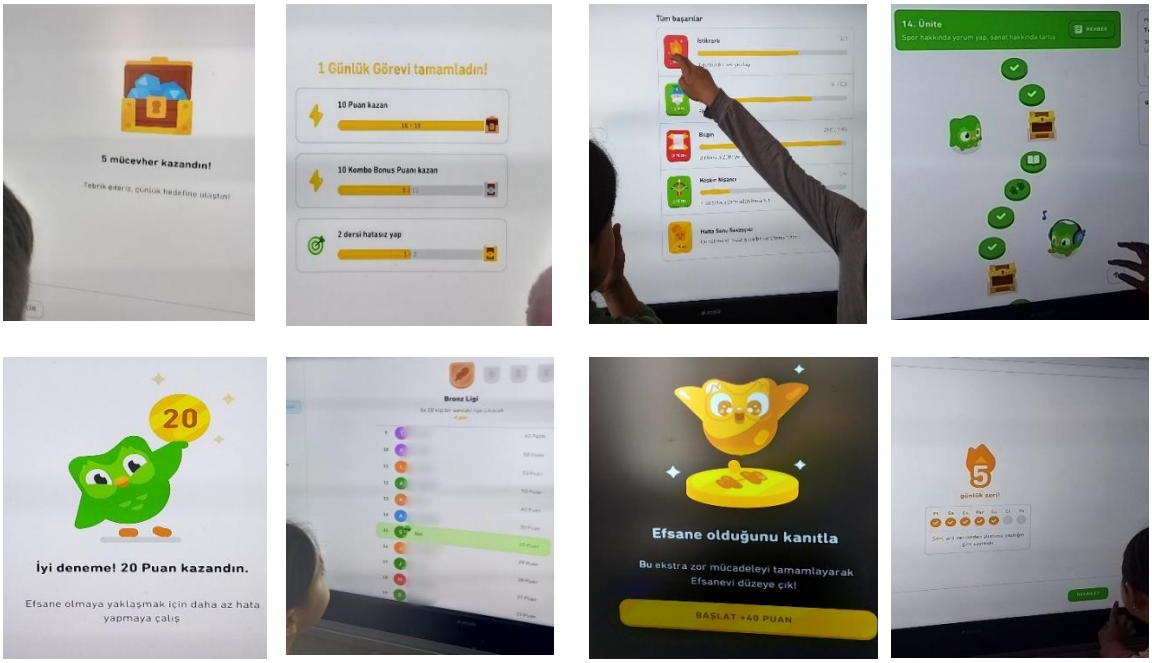


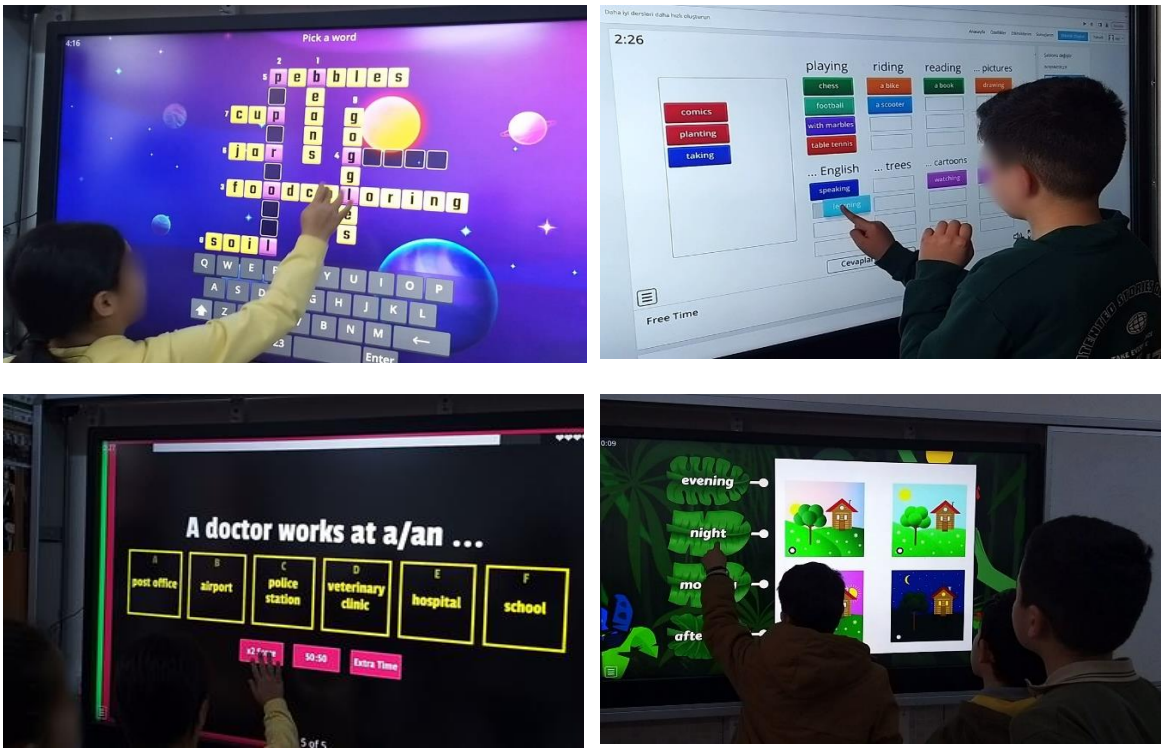
Figure 18

Learners Customizing their Avatars

Wordwall. Wordwall is an online learning platform designed to create both interactive activities that can be played on web-enabled smart devices such as smartboards and their printable versions that can be downloaded and printed out (Wordwall, n.d.). Since this study used the same activities for the experimental and control group and the only difference between the groups was the type of implementation, this platform enabled the researcher to create the printed versions of the interactive activities easily. Apart from the interactive templates that are also offered by LearningApps, Wordwall provides other interactives including true or false, flashcards, spinning the wheel, unjumbling the sentences, opening the boxes, unscrambling the words, labelling diagrams, flipping tiles, watching and memorizing, winning or losing points, word magnets, and a variety of other games (see Figure 19 for a sample showing some of the activities). For the current study, the researcher created activities for each unit using a different template for each. The activities were played with the whole class, with learners taking turns.

Figure 19

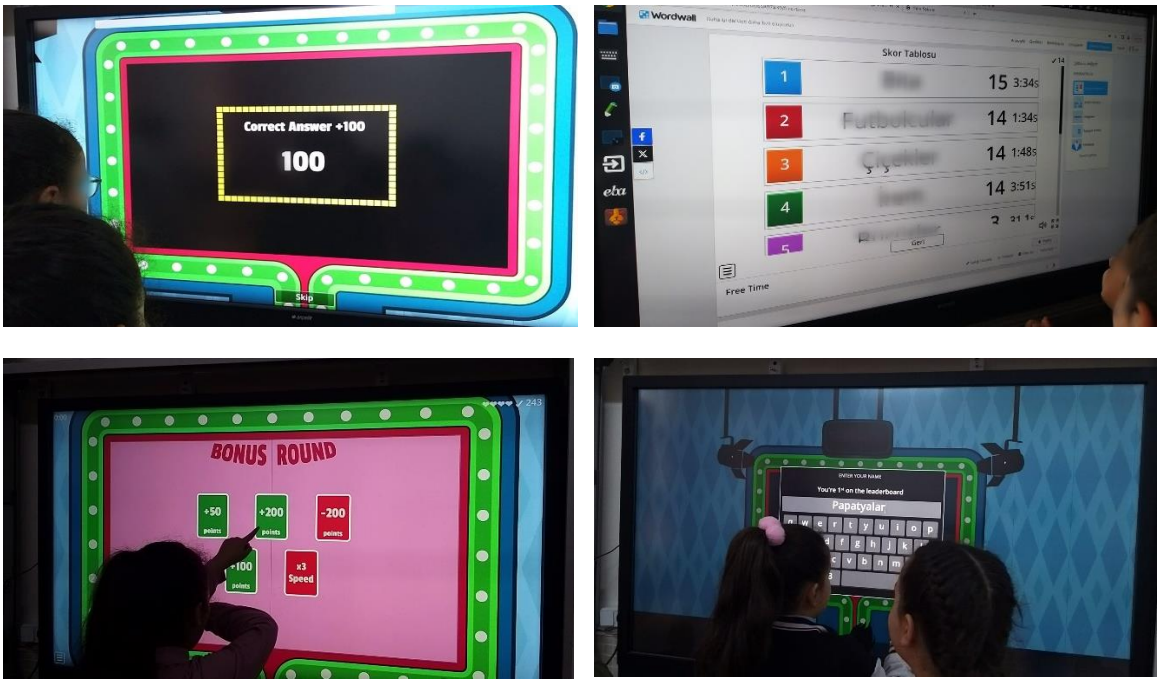
Examples of Activities from Wordwall



The researcher selected this platform taking several factors into consideration. First of all, Wordwall enables users to create their own activities. Since the study group consisted of young learners and the target vocabulary items were selected by the researcher based on their frequencies, the researcher created activities that would best suit their characteristics and the vocabulary items. Secondly, the platform allows users to adjust the difficulty of the activities and the gamification elements such as changing the countdown timer for each activity to suit their class. Thus, it enables users to set time limit based on the level of learners, the length of the questions, and the difficulty of the activities. Figure 20 demonstrates some of the game elements involved in Wordwall.

Figure 20

Examples of Game Elements from Wordwall



The fact that the platform offers various arcade style games is another reason why it was selected since it provides learners with a different kind of gamified learning experience. Another reason was that the platform enables users to switch templates, tailoring the activities to meet each learner's individual learning styles and needs and enhancing their retention through spaced reinforcement (Wordwall, n.d.).

LearningApps. LearningApps is a web 2.0 platform that enables learners to practice their skills through a variety of multimedia activities that can be browsed, created, and used (LearningApps, n.d.). The platform includes templates such as matching, pairing, ordering, putting items on a line, filling in the blanks, guessing the words, multiple-choice quizzes, cloze tests, questions related to audio, visuals, and videos, quiz shows, puzzles, crosswords, and word grids (see Figure 21 for some examples). Most of the activities provide learners with feedback, hints, leaderboard, and the game-style templates contain gamification elements such as points, lives, levels, and progression. The platform enables users to provide hints or a feedback text to be displayed when the learners answer the questions correctly.

Figure 21

Examples of Activities from LearningApps

LearningApss was selected because of several reasons. First of all, this platform allows users to create their own activities as the already-created activities may be inappropriate for the age and level of the target group. Since the current study has its own target vocabulary items, the researcher created the activities herself for the target

vocabulary items of each unit using the templates. Another reason is that the platform enables users to use various sources to create activities including texts, visuals, audio, and videos. Moreover, the activities can be designed in a way that fosters interaction by enabling learners to work not only individually but also in pairs, teams, and whole groups (Swabey, 2017). For the current study, LearningApps was used as a companion to Wordwall. Using various templates, the researcher created activities for each unit and the learners played the games taking turns at the front of the classroom. In order for these activities to be complementary to those of Wordwall, the researcher also included the activities that measured learners' productive skills such as games that required the learners to fill in the blanks.

Jeopardy (Factile). Factile is an online platform designed to create and play games in six different modes: four team review games (i.e., Jeopardy-style quiz game board, multiple choice, quiz bowl, and tile matching memory board), and two individual study games (i.e., self-paced review with flashcards and interactive choice) (Factile, n.d.). This platform was selected to increase classroom engagement and provide learners with collaborative learning experiences by enabling them to play the games in groups. With this aim in mind, the researcher used the Factile Jeopardy-style to create games using the target vocabulary items for each unit for the experimental group. For the control group, on the other hand, the researcher provided the printed, non-gamified versions of the activities.

Some of the gamification elements in Factile include countdown timer, points, hints, sound effects, leaderboards, teams, analytics report, and mascots (see Figure 22, 23, 24, and 25 for some examples). The platform allows users to customize game scoring by enabling them to assign points to the questions, adding extra points for teams that play a sequential question correctly, and deducting points for teams that do not give the correct answer.

This platform was used in the current study as it enables learners to form a team with their classmates, choose their mascots, play against the clock, earn points, and track

their ranking through the leaderboard and progression through the analytics report. Although random team assignment was also available, learners were allowed to select their own teams since it is important for young learners to feel comfortable. They selected their teams' mascots and entered their names (see Figure 22).

Figure 22

Learners Selecting and Naming Mascots

Also, the platform allows users to assign points to each category based on its level of difficulty. Thus, the researcher assigned more points to the questions that were difficult. The learners in groups decided which question to answer taking into consideration its point value and difficulty (see Figure 23).

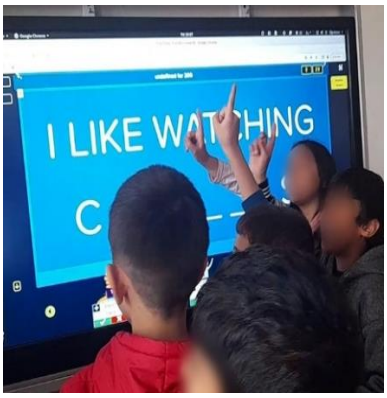
Figure 23

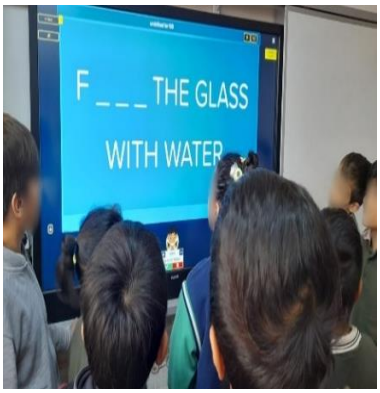
Learners Selecting Point Values

Based on the point values selected, a variety of questions that were prepared by the researcher were asked to the learners (see Figure 24).

Figure 24

Examples of Quiz Game Questions

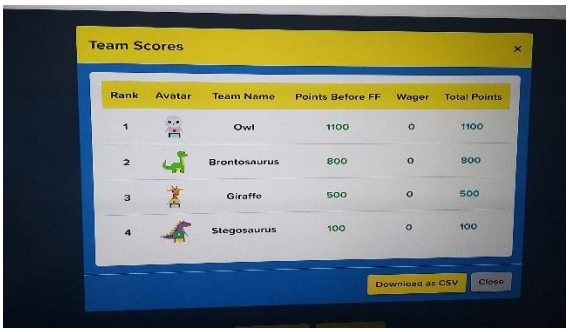


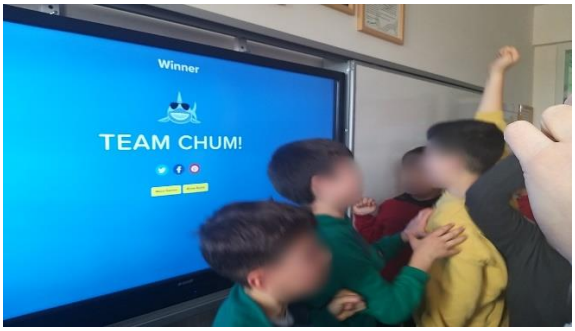


At the end of the quiz games, the teams were ranked on a leaderboard based on the points they earned and the team with the highest points was declared the winner (see Figure 25 for leaderboards that show the names, mascots, and scores of the teams and the winners).

Figure 25

Leaderboards and Winning Teams





Plickers. Plickers is an educational tool which is a variety of Student Response System (SRS) that uses Quick Response (QR) paper-based cards that are printable and unique to each learner, without the need for learners' smartphones (Kent, 2019). This is one of the most important reasons why the researcher selected Plickers to be implemented in the classroom because learners are prohibited from using smartphones in schools since the use of smartphones can distract them and disrupt their learning process.

Each side of the barcode corresponds to an answer choice (i.e., A, B, C, or D), and students answer the questions by orientating their card in a way that their intended answer is located at the top edge and facing it towards the teacher to scan their answer (see Figure 26 for a photo and screenshot taken during the quiz game).

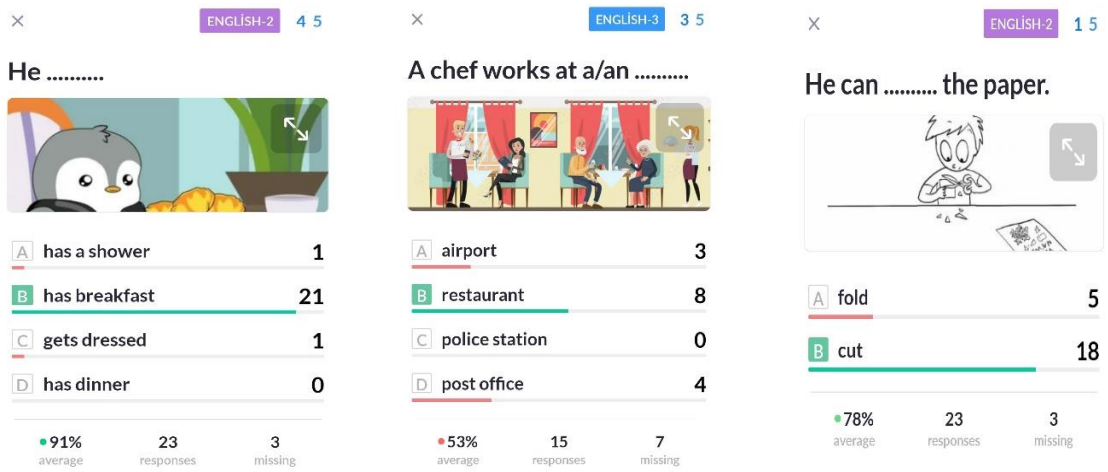
Figure 26

Plickers QR Codes

For the current study, the researcher created a quiz game for each unit based on the target vocabulary items using a variety of visuals and GIFs. She selected different cartoon characters to represent different units, and included the same set of cartoon characters within each unit in order to contextualize the quizzes for young learners. Figure 27 shows some examples of the items included in the quiz game along with learners' responses.

Figure 27

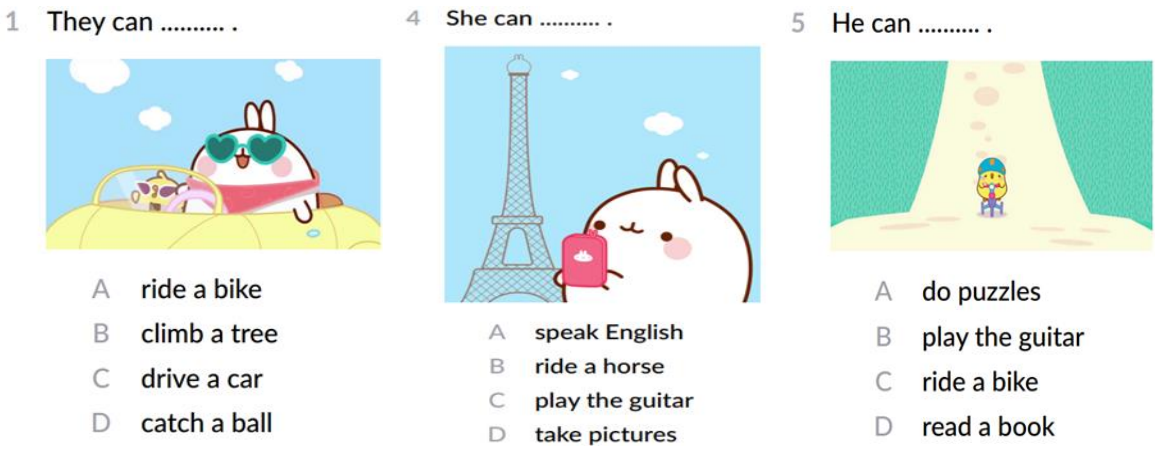
Examples of the Quizzes and Learners' Responses



Since the quizzes are printable, the researcher printed out the same questions for the learners in the control group to be completed on paper without the use of gamification (see Figure 28 for sample printed versions).

Figure 28

Sample Printed Versions of the Digitally Gamified Activities

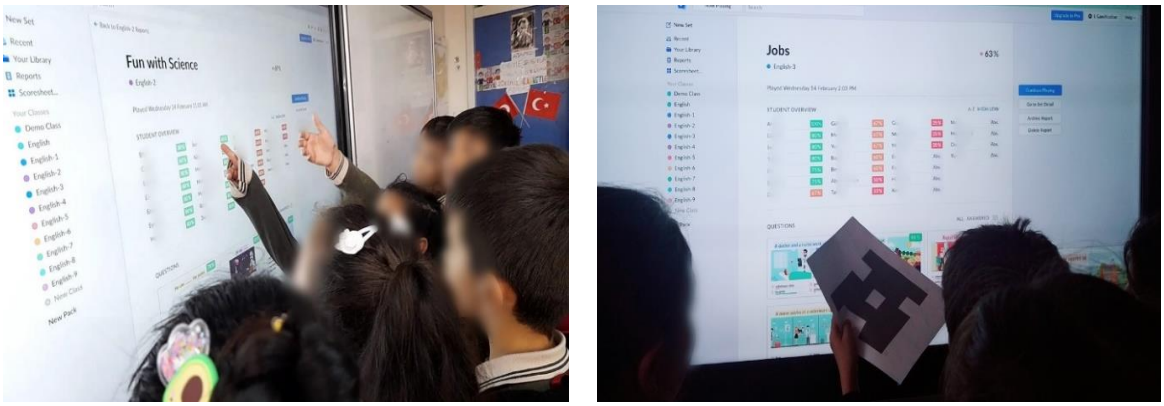


The researcher created a class for each of the experimental group classes, added learner rosters to each class, and assigned a QR card number to each learner. After that, the researcher assigned each activity that she created from the Library to the classes. The learners played the quiz games at the end of each unit and answered the questions by holding up their specific cards and orientating the barcode based on their intended answer

choice. Then, the teacher scanned the cards using the Plickers mobile application to collect their answers and move on to the next questions. Plickers' gamification elements include scores, reports, and scoresheets. Students are ranked based on their correct answers and each color corresponds to specific percentage scores, with green corresponding to a score between 85% and 100%, light green to 70-84%, orange to 60-69%, and red to less than 60% (Plickers, n.d.) (see Figure 29). At the end of the quiz, the teacher showed the learner reports and scoresheets to the learners in order for them to track their performance (see Figure 29).

Figure 29

Plickers' Learner Reports and Scoresheets



After all of the digital gamification tools and platforms mentioned above were used for each unit with the experimental group, the process of implementing digital gamification ended and the learners in both the experimental and control group took the vocabulary post-test. In order to assess their vocabulary retention, they were given the same test as a delayed post-test, six weeks later than the post-test. Finally, the semi-structured interview was conducted to further explore the effect of digital gamification on vocabulary learning.

Data Analysis

As a crucial process in research, data analysis enables researchers to address and answer research questions, test hypotheses, assess the effect of an experimental

treatment, acquire meaningful insights from different sources of data, and identify themes and patterns. Since the current study employed a mixed method research design, a combination of quantitative and qualitative data analysis was used. The results of the vocabulary test were analyzed quantitatively while the results of the semi-structured interview were analyzed qualitatively.

Quantitative Analysis

Quantitative analysis was conducted at multiple phases of the study. First of all, the researcher created a Microsoft Excel 2016 file in which each row represented a participant in the pilot study and each column represented an individual item on the test. Then, the researcher coded the scores for each item (N= 65) for each test-taker (N= 271) based on whether they were correct (1) or incorrect (0). In order to determine the reliability of the vocabulary test developed by the researcher, the test results of the pilot study were analyzed using the R Statistical Software (R Core Team, 2022). In the reliability analysis of the test results, Cronbach's alpha, KR20, and KR21 values were calculated. Further item analysis was conducted by calculating the item difficulty (Pj) and item discrimination (Rj) values for each item (see Reliability and Validity of the Vocabulary Test for the results).

In order to ensure the validity of the vocabulary test and semi-structured interview, Content Validity Index (CVI) was calculated using SPSS. After the ratings were transferred to SPSS, ratings of 3 and 4 were recoded as 1 (appropriate) while ratings of 1 and 2 were recoded as 0 (not appropriate or somewhat appropriate). Then, the Item-Level CVI (I-CVI) was calculated for each item and the Scale-Level CVI (S-CVI) was calculated to measure the overall validity of the instruments. The I-CVI was calculated by dividing the number of experts rating 3 and 4 by the total number of experts (N= 5), and the S-CVI was calculated as the average of all the I-CVIs by dividing the sum of I-CVIs for all items by the total number of items. In order to calculate the measure of agreement for the semi-structured interview, Cohen's Kappa coefficient (Cohen, 1960) was computed using SPSS.

For the main study, the researcher first scored the pre-, post-, and delayed post-tests out of 100 for each participant based on their correct answers and entered the data manually in separate Excel worksheets for the experimental group and the control group. Each participant was assigned a number (e.g., participant 1, participant 2, etc.). In the worksheets, one column represented the participant number and the other three columns represented the type of test (i.e., pre-, post-, or delayed post-) respectively while each row represented an individual participant's scores across the three tests. The data were transferred to IBM Statistical Package for the Social Sciences (SPSS) version 22 (IBM Corp., 2013). Before transferring the data, the variables were organized in SPSS. In the Variable View tab, the first column was defined as "Group", and since the data for the Group variable was categorical, its level of measurement was set as nominal. Then, in the Data View tab, the experimental group was coded as "1" and the control group was coded as "2", with the first 71 rows (1-71) representing the experimental group, and the next 71 rows (72-142) representing the control group. Then, in the Variable View tab, the next columns were defined as "Pre", "Post", and "DelayedPost", and their levels of measurement were set as scale because the data for the test scores were at the interval level. After organizing the variables, the pre-, post-, and delayed post-test data were transferred from Excel worksheets to SPSS. Thus, the datasets for the experimental group and the control group were merged into one dataset. The significance level was set at 0.05.

First, a normality analysis was conducted on the pre-, post-, and delayed post-tests of the experimental group and the control group using SPSS Explore procedure to find out whether to use parametric tests, which require an assumption of the normal distribution, or non-parametric tests, which do not. The main tests that are used to assess normality are Kolmogorov-Smirnov test and Shapiro-Wilk test. Both are used to evaluate whether the data fit to a normal curve, testing the null hypothesis that the distribution of the data is normal (Elliott & Woodward, 2007). If the p value is less than 0.05, it is significant and thus the null hypothesis is rejected. While Shapiro-Wilk test is generally more appropriate for small

sample sizes with less than 50 participants, Kolmogorov-Smirnov test is used for larger sample sizes which include more than 50 participants (Mishra et al., 2019). Since each group consisted of 71 participants, Kolmogorov-Smirnov test was used to assess normality, and the results showed that the null hypothesis for normal distribution was rejected ($p < 0.05$).

As a result, non-parametric tests were used for the comparison of the between-subjects and within-subjects test scores. Through SPSS Two Independent Samples Tests procedure, comparisons between the two groups were analyzed using Mann-Whitney U test, which is a non-parametric alternative to the independent samples t-test. In order to determine whether there was a significant difference between the experimental and control group's pre-test, post-test, and delayed post-test scores, Mann-Whitney U test was used. The reason why the test was used to compare the groups' pre-test scores was to determine whether their scores were similar at the start of the study and whether any differences in outcomes could be attributed to the intervention.

Whether there was a significant difference within the groups' pre-test, post-test, and delayed post-test scores was investigated using Friedman's test, which is a non-parametric alternative to repeated-measures analysis of variance (ANOVA), using SPSS Tests for Several Related Samples procedure. In order to run the test separately for the experimental group and the control group, the data in SPSS was split into separate groups. Since the test for the experimental group showed a significant result ($p < 0.05$) without indicating where the significant differences lay, Wilcoxon Signed-Ranks test, a non-parametric alternative to the dependent samples t-test, was used between the pre-test and post-test, between the pre-test and delayed post-test, and between the post-test and delayed post-test to further determine which test pairs were significantly different.

The same procedure was repeated for the control group using Friedman's test to determine whether there was a significant difference within its pre-test, post-test, and

delayed post-test scores. Since the test indicated a significant result ($p < 0.05$), Wilcoxon test was used to make pairwise comparisons using Two Related Samples Tests procedure.

Qualitative Analysis

In order to draw meanings from what interviewees said about the questions discussed in the semi-structured interview, the researcher conducted qualitative data analysis in the form of thematic analysis, a qualitative analytic method for “identifying, analyzing, and reporting patterns (themes) within data” (Braun & Clarke, 2006, p. 79). The researcher carried out the qualitative analysis using NVivo version 14 (Lumivero, 2023), which is a qualitative data analytics software that allows researchers to import and organize data, explore emerging topics, identify themes, visualize data, and draw conclusions. While determining what counts as a theme, researcher judgement based on whether it captures an important element regarding the overall research question is necessary (Braun & Clarke, 2006). Therefore, the researcher first worked inductively to build from particular themes to a general and comprehensive set of themes and then thought deductively to determine if more data is needed to support each theme. This process is referred to as inductive/deductive hybrid thematic analysis in mixed methods research, which uses the hybridization or combination of the inductive approach to generate themes from the data and the deductive approach to use pre-ordinate themes developed based on the literature in the field (Proudfoot, 2023).

First of all, the researcher recorded the semi-structured interview on a digital audio recorder and transcribed it using Microsoft Word. Then, she organized and prepared the interview data for analysis by sorting it into different types based on the sources of information. The researcher also visualized the interview data by creating a word cloud that demonstrated the most frequently used words. All of the transcribed interviews were read multiple times and studied closely to identify the main themes they communicated. With this aim, the researcher went through each line of the text data gathered during data collection, segmented sentences into categories, and assigned codes to those categories. This

process is referred to as *coding*, which involves organizing the data by selecting certain chunks, taking notes regarding their categories, and using terms to label those categories (Creswell & Creswell, 2018, p. 269; Rossman & Rallis, 2012). Since there is a huge amount of data in a qualitative study or in the qualitative phase of a mixed methods research design, researchers need to focus on a certain part of it and disregard others. This can be achieved by aggregating data into themes, the number of which should be between five and seven (Creswell, 2013). After generating the initial codes, therefore, the researcher went on to collate these codes into potential themes, and reviewed the themes with regard to the coded extracts and the entire transcript. Finally, the researcher defined, refined, and named seven broad themes in participants' responses. The themes were identified as Vocabulary Learning, Vocabulary Retention, Intrinsic Motivation, Flow State, Game Elements, Challenges, and Suggestions. The validity of the analysis was ensured through meticulous examination of the interview data, codes, and themes by the researcher and a faculty member. Furthermore, Cohen's Kappa coefficient was used as a measure of agreement between the researcher and the faculty member, and was calculated as 0.87 ($p < 0.001$). Since Kappa statistics between 0.81 and 1.00 correspond to an almost perfect strength of agreement (Landis & Koch, 1977, p. 165), it can be concluded that there was a strong agreement with regard to the codes and themes.

Chapter 4

Findings, Comments and Discussion

This chapter will present the quantitative and qualitative results of the study, explain how these results together provide a more comprehensive understanding of how digital gamification affects young EFL learners' vocabulary learning, and discuss how the results relate to the existing body of research on the topic.

Quantitative Results for the Pilot Study

The results of the vocabulary test administered to the pilot study participants showed that the Cronbach's alpha, KR20, and KR21 values were calculated as 0.93, 0.93 and 0.91 respectively, which indicated a high level of reliability. With regard to item difficulty (Pj), 70.77% (N=46) of the items in the vocabulary test were found to have an acceptable level of difficulty while 29.23% (N=19) of them were flagged as difficult. As for item discrimination (Rj), 95.38% (N=62) of the items were found to be acceptable while 3 of them were flagged as poor (see Reliability and Validity of the Vocabulary Test for detailed information).

Quantitative Results for the Main Study

For the main study, quantitative data was collected through vocabulary pre-test, post-test, and delayed post-test that were administered to the experimental and control group. In this section, the results will be presented with regard to the relevant research questions. In order for a study to have meaningful conclusions and avoid incorrect interpretations, the normality of the data must first be tested to determine whether to use parametric tests or non-parametric tests (Mishra et al., 2019). Therefore, the normality of the pre-test, post-test, and delayed post-test scores for both groups were checked using Kolmogorov Smirnov test and the results are presented in Table 11. The hypotheses regarding the normality of the distribution of the data were as follows:

Null hypothesis (H_0): The data is normally distributed.

Alternative hypothesis (H_1): The data is not normally distributed.

Table 11

Kolmogorov-Smirnov Test Results

Test	Group	Kolmogorov-Smirnov		
		Statistic	df	p
Pre-test	Experimental	,232	71	,000
	Control	,122	71	,011
Post-test	Experimental	,152	71	,000
	Control	,098	71	,091
Delayed post-test	Experimental	,170	71	,000
	Control	,090	71	,200

The results indicated that while the distributions of the post-test and delayed post-test scores of the control group were normal ($p > 0.05$), the distributions of the pre-, post-, and delayed post-test scores of the experimental group and the pre-test scores of the control group were not normal ($p < 0.05$). Since the test is statistically significant and thus the null hypothesis assuming normality was rejected for many of the distributions, non-parametric tests were used for the comparison of the test scores both between and within groups.

Quantitative Results for the First Research Question

The first research question with regard to the quantitative phase of the study was the following:

1. What is the effect of digital gamification on young EFL learners' vocabulary learning?

In order to address this research question, the following research sub-question was first investigated to determine whether the experimental group and the control group were

comparable at the pre-test phase and whether any differences observed later in the post-test and delayed post-test could be attributed to the intervention rather than pre-existing differences between the groups:

1.1. Is there a significant difference between the pre-test scores of the experimental group and the control group?

Mann-Whitney U test was used to determine whether the pre-test scores of the experimental group and control group significantly differed from each other or not (see Table 12).

Table 12

Mann-Whitney U Results for Pre-Test

Test	Group	N	Mean	Std. Deviation	Median	Min	Max	U	P
Pre-test	Experimental	71	16,59	11,33	14	2	51	2344,50	,472
	Control	71	17,06	10,80	15	2	61		

The results indicated that while the mean of the pre-test scores of the control group was found to be relatively higher than that of the experimental group, no statistically significant difference was found between the groups' pre-test scores ($p > 0.05$). This result indicated that the groups were similar at the start of the study, and that any differences observed in the post-test and delayed post-test could be attributed to the use of digital gamification.

In order to determine whether any changes occurred between the groups after the intervention, the following research question was investigated:

1.2. Is there a significant difference between the post-test scores of the experimental group and the control group?

Mann-Whitney U test was used to determine whether there was a significant difference between the groups in terms of the post-test (see Table 13).

Table 13

Mann-Whitney U Test Results for Post-Test

Test	Group	N	Mean	Std. Deviation	Median	Min.	Max.	U	P
Post-test	Experimental	71	79,80	16,80	85	42	100	1809,00	,004*
	Control	71	72,44	16,40	73	34	96		

*p < 0.05

The results demonstrated that the post-test mean of the learners in the experimental group was higher than that of the control group. A statistically significant difference was found between the post-test scores of the learners in the experimental group and control group (p < 0.05).

In order to investigate whether digitally gamified vocabulary learning had an effect on learners' improvement, and if so, whether that effect was sustained over time, Friedman test was used to determine whether there was a significant difference between the pre-test, post-test, and delayed post-test scores of the learners in the experimental group (see Table 14).

Table 14

Friedman Test Results for the Experimental Group

Group	Test	N	Mean	Std. Deviation	Median	Min.	Max.	χ^2	P
Experimental	Pre-test	71	16,59	11,330	14	2	51	114,043	,000*
	Post-test	71	79,80	16,796	85	42	100		
	Delayed post-test	71	76,97	16,375	81	39	98		

*p < 0.05

The mean of the post-test scores of the learners in the experimental group was found to be higher compared to the mean of their pre-test and post-test scores. Friedman Test results indicated that there was a significant difference between the experimental group's pre-test, post-test, and delayed post-test scores ($p < 0.05$). However, the test only indicates that a significant difference exists without identifying where it lies. As a result, Wilcoxon Signed-Ranks Test was used to determine which tests differed significantly from each other. The results indicated that there was a significant difference between the post-test and pre-test scores of the learners in the experimental group in favor of the post-test ($p < 0.05$), a significant difference between the delayed post-test and pre-test scores in favor of the delayed post-test ($p < 0.05$), and a significant difference between the delayed post-test scores and the post-test scores in favor of the post-test ($p < 0.05$). In order to determine whether the experimental group significantly improved after the intervention, the following research question was investigated:

1.3. Is there a significant difference between the pre-test and post-test scores of the experimental group?

In order to address this question, a pairwise comparison was made between the learners' pre-test and post-test scores using Wilcoxon test (see Table 15).

Table 15

Wilcoxon Test Results for the Experimental Group's Post- and Pre-Test

Group		Post-test - Pre-test
Experimental	Z	-7,323
	p	,000*

*p < 0.05

The results showed that there was a significant difference between the post-test and pre-test scores of the learners in the experimental group ($p < 0.05$). Since the post-test

scores were higher, it indicated that the intervention led to an improvement in vocabulary learning.

In order to investigate whether non-digitally gamified vocabulary learning led to an improvement within the pre-test, post-test, and delayed post-test scores of the learners in the control group, Friedman Test was used (see Table 16).

Table 16

Friedman Test Results for the Control Group

Group	Test	N	Mean	Std. Deviation	Median	Min.	Max.	χ^2	P
Control	Pre-test	71	17,06	10,798	15	2	61	114,113	,000*
	Post-test	71	72,44	16,404	73	34	96		
	Delayed post-test	71	66,66	17,703	66	32	96		

*p < 0.05

The mean of the post-test scores of the learners in the control group was found to be higher compared to that of the pre-test and delayed post-test scores. Statistically, there was a significant difference between the pre-test, post-test, and delayed post-test scores of the learners in the control group ($p < 0.05$). In order to determine which specific pairs significantly differed from each other, Wilcoxon test was used. Wilcoxon test results indicated that there was a significant difference between the post-test and pre-test scores of the learners in the control group in favor of the post-test ($p < 0.05$), a significant difference between the delayed post-test and pre-test scores in favor of the delayed post-test ($p < 0.05$), and a significant difference between the delayed post-test and post-test scores in favor of the post-test ($p < 0.05$). Whether the control group improved significantly from the pre-test to the post-test was investigated through the following research question:

1.4. Is there a significant difference between the pre-test and post-test scores of the control group?

In order to address this research question, a pairwise comparison between the pre-test and post-test scores of the learners in the control group was made using Wilcoxon test (see Table 17).

Table 17

Wilcoxon Test Results for the Control Group's Post- and Pre-Test

Group		Post-test - Pre-test
Control	Z	-7,324
	p	,000*

*p < 0.05

The test results indicated that there was a significant difference between the post-test and pre-test scores of the learners in the control group, with the mean of the post-test being higher. It can therefore be concluded that the control group also had an improvement in their vocabulary learning.

Quantitative Results for the Second Research Question

The second quantitative research question was concerned with vocabulary retention:

2. What is the effect of digital gamification on young EFL learners' vocabulary retention?

In order to address this research question, the following sub-research questions were investigated to determine whether there was a significant difference both between and within the groups in terms of retention:

2.1. Is there a significant difference between the delayed post-test scores of the experimental group and the control group?

Mann-Whitney U test was used to compare the delayed post-test scores of the two groups (see Table 18).

Table 18

Mann-Whitney U Test Results for Delayed Post-Test

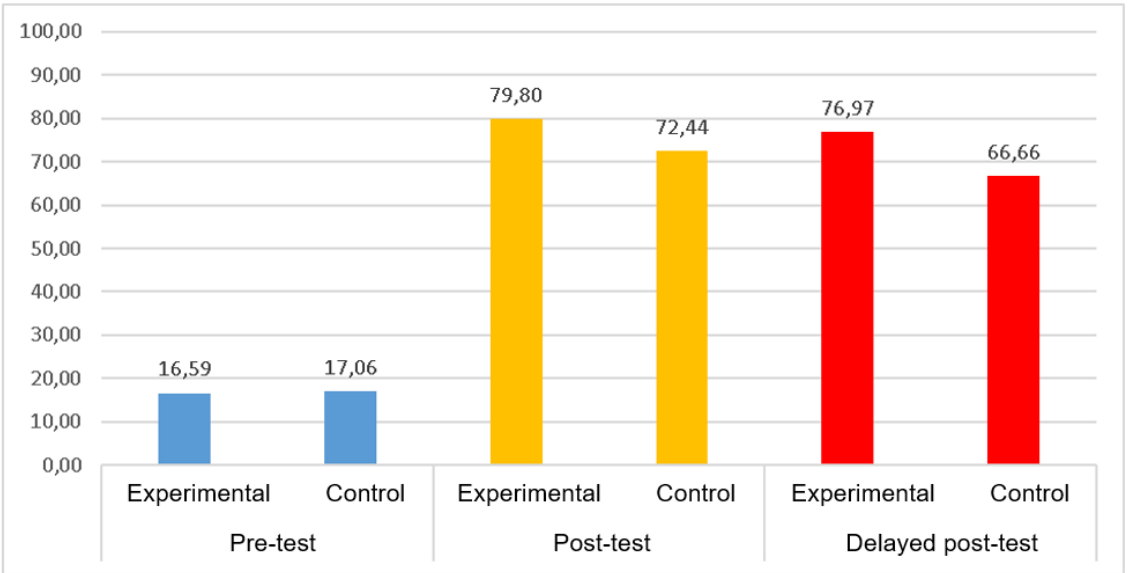
Test	Group	N	Mean	Std. Deviation	Median	Min	Max	U	P
Delayed post-test	Experimental	71	76,97	16,38	81	39	98	1652,00	,000*
	Control	71	66,66	17,70	66	32	96		

*p < 0.05

The mean of the delayed post-test scores of the learners in the experimental group was found to be higher than that of the learners in the control group. A statistically significant difference was found between the delayed post-test scores of the learners in the experimental group and control group (p < 0.05). Overall, Figure 30 illustrates the mean scores of the experimental and control group for the pre-, post-, and delayed post-test.

Figure 30

Mean Test Scores of the Groups



In order to investigate whether there was a significant difference within the experimental group from the post-test to the delayed post-test, the following research question was investigated:

2.2. Is there a significant difference between the post-test and delayed post-test scores of the experimental group?

Wilcoxon test was used to compare the post-test and delayed post-test scores within the experimental group (see Table 19).

Table 19

Wilcoxon Test Results for the Experimental Group's Delayed Post- and Post-Test

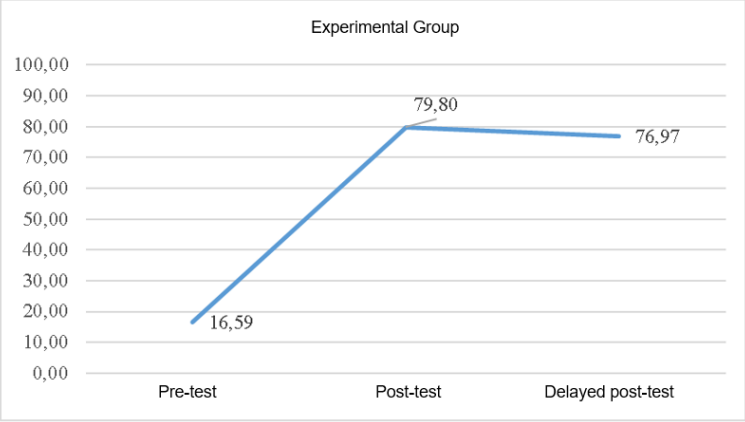
Group		Delayed Post-test - Post-test
Experimental	Z	-3,939
	p	,000*

*p < 0.05

The test revealed that there was a significant difference between the delayed post-test and post-test scores of the experimental group, with the post-test scores being higher (p < 0.05). This suggests that the effect of the intervention has diminished over time. Overall, Figure 31 demonstrates the changes in the experimental group across the pre-test, post-test, and delayed post-test.

Figure 31

Changes in the Experimental Group



Whether the post-test and delayed post-test scores differed significantly from each other within the control group was investigated through the following research question:

2.3. Is there a significant difference between the post-test and delayed post-test scores of the control group?

Wilcoxon test was used to address this research question and the results are presented in Table 20.

Table 20

Wilcoxon Test Results for the Control Group's Delayed Post- and Post-Test

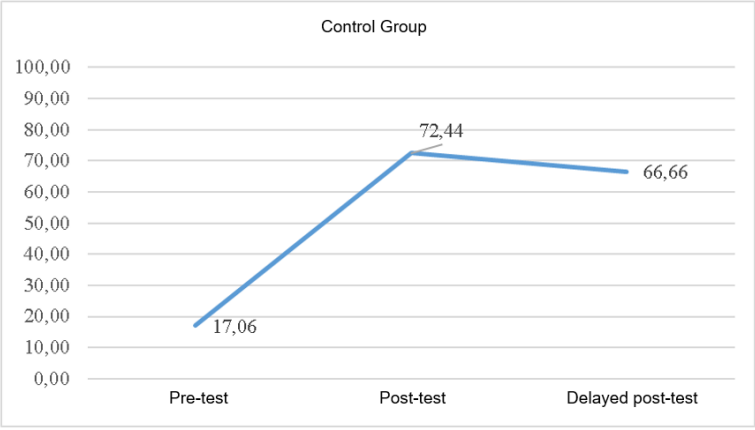
Group		Delayed Post-test - Post-test
Control	Z	-3,964
	p	,000*

*p < 0.05

The results revealed that there was a significant difference between the delayed post-test and post-test scores of the learners in the control group (p < 0.05). Since the post-test scores were higher, it can be concluded that there was a decline in the control group's performance over time. Overall, Figure 32 illustrates the changes in the control group over time.

Figure 32

Changes in the Control Group



Taken together, the Wilcoxon test results revealed that both groups had significant differences between the pre-test and post-test, indicating that both digitally gamified

vocabulary learning and traditional methods led to an improvement in learners' vocabulary. However, Mann-Whitney U test results indicated that although there were no significant baseline differences between the groups, there was a significant difference at the post-test stage. Thus, it can be stated that although both groups improved significantly from the pre-test to the post-test, digitally gamified vocabulary learning was more effective as compared to non-digitally gamified vocabulary learning.

With regard to retention, there was a significant decline in both groups' scores from the post-test to the delayed post-test, suggesting that the effects of both digitally gamified vocabulary learning and traditional vocabulary learning have diminished over time. However, Mann-Whitney U test results revealed that the learners in the experimental group significantly outperformed those in the control group in the delayed post-test. As a result, it can be stated that although both groups experienced a decline, the control group showed a greater decrease, which was statistically significant. Thus, non-digitally gamified vocabulary learning was found to be less effective in long-term vocabulary retention.

Qualitative Results for the Main Study

Qualitative Results for the Third Research Question

The third research question was related to the qualitative phase of the study:

3. What are young EFL learners' opinions and attitudes towards using digital gamification in learning vocabulary?

In order to answer this research question, the researcher conducted a qualitative analysis of the semi-structured interview using NVivo version 14 (Lumivero, 2023). By employing an inductive/deductive hybrid thematic analysis, the researcher conducted an in-depth analysis of the interview data, identifying themes and codes. The researcher also visualized the interview data by using the word cloud feature of NVivo version 14, which shows the most frequently used words (see Figure 33). The interview was conducted with 25 participants.

Figure 33

Word Cloud for the Interview Data

As can be seen in Figure 33, some of the most frequently used words in the interview were “very”, “more”, “enjoyable”, “good”, and “nice”, which highlight the participants’ positive experiences. These positive experiences were categorized under different themes such as Intrinsic Motivation, Vocabulary Learning, Vocabulary Retention, Flow State, and Game Elements based on the main ideas they communicated. Other most frequently used words included “points”, “time”, “level”, “avatar”, etc., which were associated with the theme of Game Elements. Moreover, such frequent words as “stress”, and “challenging” were related to the theme of Challenges. Thus, the word cloud provided richer insights into the interview data.

Seven broad themes emerged from the thematic analysis. The themes and sub-themes identified in participants’ responses are presented in Table 21.

Table 21

Thematic Analysis Results

Theme	Sub-theme	Frequency

Vocabulary Learning	Digitally Gamified Vocabulary Learning	24
	Traditional Vocabulary Learning	1
	Collaborative Vocabulary Learning	18
	Individual Vocabulary Learning	7
Vocabulary Retention	Digitally Gamified Vocabulary Retention	24
	Traditional Vocabulary Retention	1
Intrinsic Motivation	Enjoyment	25
	Interest	25
	Importance	25
	Usefulness	25
	Perceived Choice	25
	Perceived Competence	21
	Tension	20
	Relatedness	18
Flow State	Engagement	21
	Concentration	15
	Sense of Time	9
Game Elements	Collaboration	20
	Time Pressure	20
	Avatars	18
	Competition	17
	Feedback	17
	Leaderboards	16
	Points	16
	Teams	13
	Badges	12
	Levels	10
	Turns	6
	Visuals	5

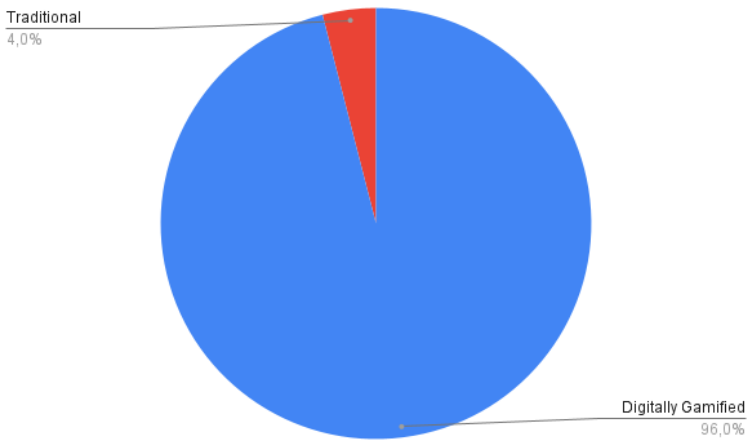
Challenges	Activity-Related Challenges	14
	Game-Related Challenges	6
Suggestions	Customization of Game Elements	6
	Further Use of Digital Gamification in English Classes	3
	Activity Types	2

As can be seen in Table 21, a combination of pre-determined and emerging patterns was used. The emerging ones included the sub-themes of Engagement, Sense of Time, Collaboration, Avatars, Competition, Teams, Turns, Visuals, and the theme of Suggestions. While the least frequent sub-themes were Traditional Vocabulary Learning and Traditional Vocabulary Retention (N=1) with a percentage of 4%, the most frequent ones included Enjoyment, Interest, Importance, Usefulness, and Perceived Choice (N=25) with a percentage of 100%. Each theme and sub-theme will be discussed below.

Vocabulary Learning. This theme comprises the sub-themes of Digitally Gamified Vocabulary Learning which refers to learning vocabulary through digital gamification versus Traditional Vocabulary Learning which refers to non-digital, non-gamified, and non-digitally gamified learning.

Figure 34

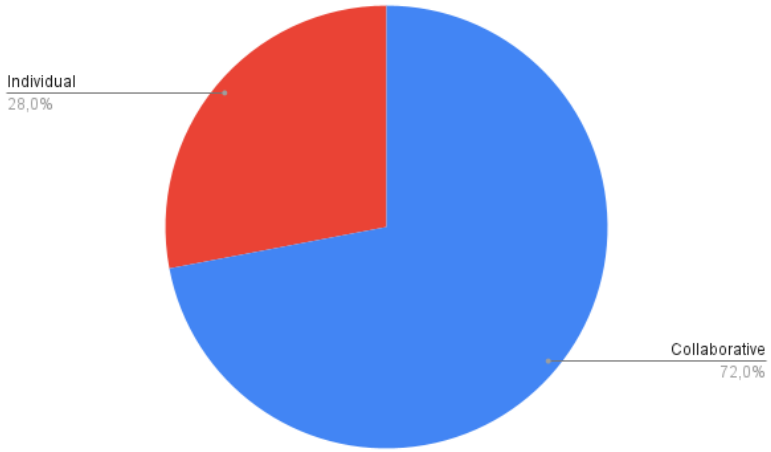
Digitally Gamified Vocabulary Learning versus Traditional Vocabulary Learning



Furthermore, the theme contains Collaborative Vocabulary Learning versus Individual Vocabulary Learning, depending on which one the participants think is more effective in their vocabulary learning process.

Figure 35

Collaborative Vocabulary Learning versus Individual Vocabulary Learning



First, the following research sub-question was investigated regarding digitally gamified versus traditional vocabulary learning:

3.5. What are young EFL learners' attitudes towards digitally gamified vocabulary learning as compared to non-digitally gamified traditional vocabulary learning?

Digitally Gamified Vocabulary Learning. When the participants were asked whether they were able to learn vocabulary more easily with digital games or the non-digitally gamified traditional methods they used in their previous lessons, almost all participants (N=24, 96%) stated that digital games were more effective because of several reasons including highly enjoyable experiences, increased motivation, enhanced performance, game elements, and improved skills:

> I think games are more effective in learning new words because I had great fun while playing games and it increased my motivation. I used to not want to learn English

> but now I want to learn more English and I have started to like English lessons very much because games teach vocabulary with kindness and fun. (Participant 8)
>
> I would definitely prefer games. Games increased my performance in English classes because they were highly enjoyable. Thanks to games, I learned new words by combining the words I already knew with the words I did not know. (Participant 2)
>
> I think books are very boring and technological games are very enjoyable. Games helped us learn well because they were really interesting. We learned more with games. (Participant 25)
>
> Games made it much easier and fun for me to learn English vocabulary than other activities. I became more enthusiastic and ambitious in learning new words. I constantly tried to learn more words to earn points and level up. (Participant 5)
>
> Games helped me learn English vocabulary more ambitiously. As I played the games, I saw that I had a lot of fun and learned English better. All games were very enjoyable and informative. They even improved my speaking skills. (Participant 14)

Traditional Vocabulary Learning. One of the participants stated that she would prefer traditional printed materials over digital games:

> I think games are very enjoyable but I focus better when learning vocabulary from books because I can understand better by writing and using tangible materials. (Participant 16)

Since all interviewees except one (96%) indicated that they learned vocabulary better with digitally gamified vocabulary learning, the findings of the semi-structured interview suggest that digital gamification was found by almost all learners to be a more effective method than traditional ones in terms of vocabulary learning. For learners that can understand better with printed materials, the printed versions of the digitally gamified activities can be provided in order to support their learning style.

As for the comparison of collaborative versus individual vocabulary learning, the following research sub-question was investigated:

3.4. What are young EFL learners' attitudes towards using digital gamification in learning vocabulary with regard to individual learning versus collaborative learning?

Collaborative Vocabulary Learning. 72% of the learners who were interviewed (N=18) indicated that they found collaborative digitally gamified vocabulary learning more effective than individual digitally gamified vocabulary learning. The extracts below show some of the respondents' reasons for preferring collaborative vocabulary learning with regard to helping each other, having fun, and having increased social skills:

> I found learning in groups better because I like teamwork and collaboration. It was great to have another friend from our team help us when we got a question wrong. Playing games in groups also improved our social skills. (Participant 1)

> I liked the games we played in groups more because when there were words we did not know, we helped each other. Our teammates who knew the words taught the words to those who did not. Before answering questions, we got everyone's opinions and collaborated. (Participant 3)

> When a question came up, we all decided on an answer together and answered the question accordingly. Playing games in groups is better because we have fun and learn better. I think individual games are boring because we play alone. (Participant 9)

> We learned English vocabulary better in groups because we felt very excited and had a lot of fun while playing games in teams. (Participant 12)

Individual Vocabulary Learning. 28% of the learners who were interviewed (N=7) stated that they found individual digitally gamified vocabulary learning more effective than collaborative digitally gamified vocabulary learning. The interviewees indicated that they felt

most comfortable playing games alone due to various reasons including lack of personalized results and fear of failure in group games:

> I liked the individual games, especially the game with the QR code, because I could see my ranking compared to others and the words that I needed to revise. In group games, others answered the questions before I could think, and I was not satisfied with my own performance. (Participant 20)

> I prefer individual games because we cannot make a decision in time as a group. So, the time runs out and the other team wins. Also, even though I know a word correctly, my teammates give wrong answers and our team loses points. (Participant 10)

> I choose individual games because I felt very stressed about getting the questions wrong and making my group fall behind in games we played as teams. My group gets angry when I answer a question incorrectly as we lose points. (Participant 25)

Since most of the interviewees (N=18, 72%) reported that they preferred collaborative digitally gamified vocabulary learning to individual digitally gamified vocabulary learning, the findings indicate that adding the collaborative element to digitally gamified learning process can further enhance learners' vocabulary by providing them with a fun and interactive environment. In order to provide learners with better learning experiences, digitally gamified learning activities that are designed in a way that tracks each group member's progress individually can be used and learners can be motivated and encouraged to take part in the group without fear of making mistakes.

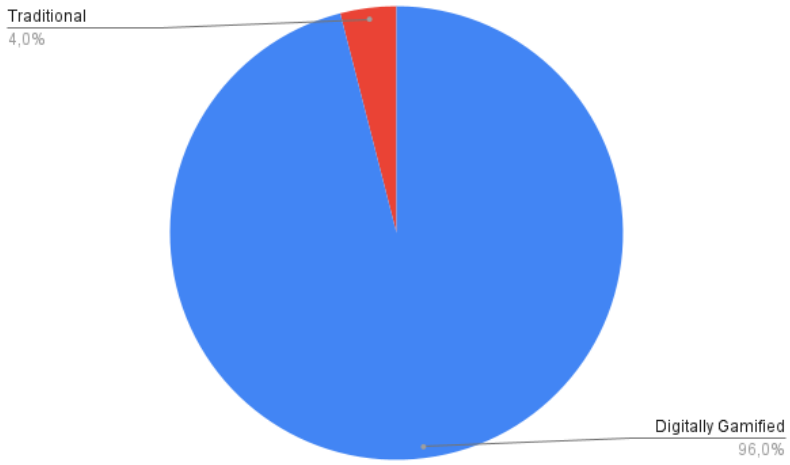
Vocabulary Retention. This theme investigated the following research sub-question:

3.6. What are young EFL learners' attitudes towards digitally gamified vocabulary retention as compared to non-digitally gamified traditional vocabulary retention?

This theme consists of Digitally Gamified Vocabulary Retention which means retaining vocabulary through digital gamification versus Traditional Vocabulary Retention which refers to non-digital, non-gamified, and non-digitally gamified vocabulary retention.

Figure 36

Digitally Gamified versus Traditional Vocabulary Retention



Digitally Gamified Vocabulary Retention. When asked whether they found digital games or traditional methods more effective in retaining vocabulary, almost all interviewees (N=24, 96%) stated that they found digitally gamified vocabulary retention more effective as a result of several reasons including feedback, recalling flashbacks, and spaced repetition, which is a method where a piece of information is reviewed and recalled at systematic intervals:

> When I see a word, I remember the moment I encountered it while playing the game and I remember what it means. It immediately reminds me of the exact things we did in the game. Thus, I never forget the words I learned with games. (Participant 6)

> While playing Duolingo, for example, it shows the same question multiple times and gives feedback. So, even if I cannot learn a word when I first see a question, I become able to bring it back into my mind the next time I see it. (Participant 5)

> Thanks to the games, I was able to keep the words I learned in my memory because they showed me my correct and incorrect answers and it directly remained in my mind. The words I see in the books do not stay in my mind. (Participant 12)

> I remember what I have learned better with games because games are very interesting, fun, and memorable. When I take an exam containing words similar to the ones I saw in the games, I immediately remember the things we did while playing the game, even the colors of the visuals, and feel motivated. (Participant 24)

> Since we learn more while playing games, I can remember and say the correct answer faster when our English teacher asks us a question. (Participant 17)

Traditional Vocabulary Retention. One interviewee felt that reading and taking notes were more effective than playing digital games with regard to vocabulary retention:

> I enjoy playing games but I can keep the words I have learned in my mind in a more permanent way by reading books and writing the words down to remember them. (Participant 16)

The findings of the interview therefore suggest that digitally gamified vocabulary activities were more effective than traditional vocabulary activities since such factors as game elements and spaced repetition were reported to result in better retention by almost all of the interviewees (96%).

Intrinsic Motivation. The following research question was addressed with regard to intrinsic motivation:

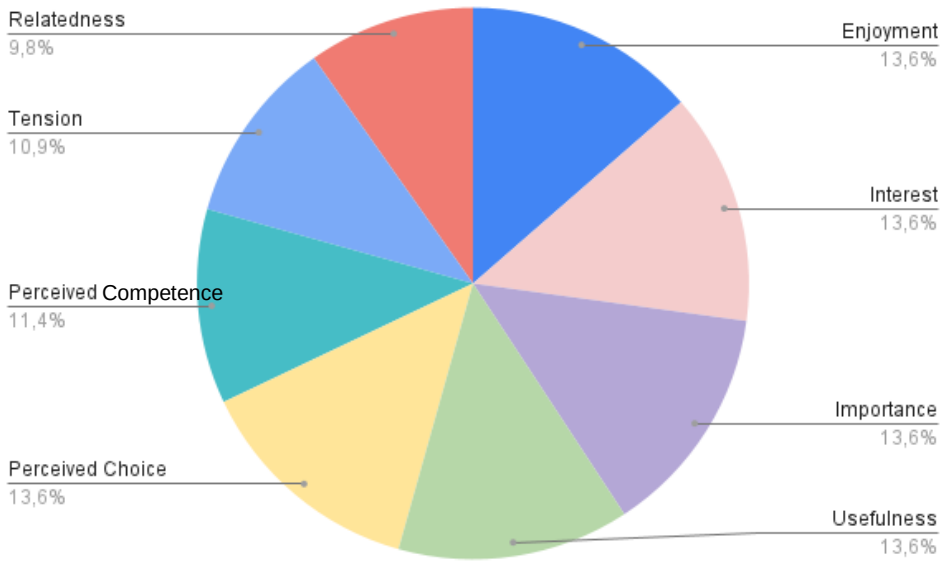
3.2. What are young EFL learners' attitudes towards using digital gamification in learning vocabulary with regard to intrinsic motivation?

The sub-themes of this theme were derived deductively from an existing theoretical framework regarding motivation, with specific reference to intrinsic motivation. This theme, therefore, consisted of eight adapted sub-questions of the Intrinsic Motivation Inventory (CSDT, n.d.), which is based on Ryan and Deci's (2000b) Self-Determination Theory:

Enjoyment, *Interest*, *Perceived Competence*, *Importance*, *Tension*, *Perceived Choice*, *Usefulness*, and *Relatedness*. These sub-questions were selected by the researcher based on the research aims and questions. Then, interviewees were asked about these pre-determined sub-questions in the semi-structured interview.

Figure 37

Components of Intrinsic Motivation



Enjoyment. A recurrent sub-theme in the interviews was a sense amongst interviewees (N= 25, 100%) that the process of vocabulary learning through digital games was quite enjoyable. A variety of perspectives were expressed with regard to what made the digitally gamified learning process enjoyable, including the fun factor, game elements, and collaborative learning:

> I really enjoyed learning words by playing games in groups. Everything was great. I was full of enthusiasm. We all tried to become the winner by collecting points and had a great time together. I think games strengthen our motivation and make English fun. (Participant 7)

> In my opinion, yes, playing games was really fun. I was extremely happy to earn points thanks to the questions I answered correctly. The leaderboard and competing

> with my friends excites and entertains me very much. When I have fun with games, I learn better. Having fun is very important to me. (Participant 4)
>
> I had difficulty with the words we had just learned, but I enjoyed playing games very much. When the game is fun, I get excited as soon as the first question comes up, so I always want to raise my hand and come to the board. I become extremely happy when I earn rewards. (Participant 9)

Interest. All of those interviewed stated that the process of vocabulary learning through digital gamification was very interesting due to several reasons including the variety of the games, the fun factor, visual effects, and game elements:

> There were a variety of very nice games that attracted my attention. What particularly interested me was that the games were fun and informative. The game with avatars sparked my interest the most. We played both as a group and in turns. (Participant 13)
>
> I was very interested in the games. When they are colorful and fun, it adds more enthusiasm to learning English. Also, I became more interested in English lessons. (Participant 7)
>
> All of the games were very interesting to me and they all caught my attention. I showed great interest in all of them because they were extremely enjoyable. (Participant 15)

Importance. A common view amongst interviewees (N=25, 100%) was that it was important to them to do well at the digitally gamified activities since they wanted to be successful in English, earn more points, and rank high:

> I love English and it is really important for me to be successful. For example, if I cannot win, I study harder to do better because the most important thing for me is to rank first in a game. (Participant 10)

> I think it is very important that I answer the questions correctly in the games, achieve success there, and show the rewards I have earned in the games off to my classmates or in other places to attract their attention. (Participant 3)

> It is highly important for me to be successful and do better than others. I feel very sad if I miss even one point. When I level up, I feel very happy. If I cannot, I feel very bad. I put in a great deal of effort until I improve myself and rise quickly in rank. (Participant 22)

Usefulness. All of the interviewees indicated that playing digital games was a useful way of learning vocabulary due to various reasons including feedback, the fun factor, and enhanced vocabulary learning experiences:

> The games were very useful. When we received feedback, we learned the correct answers to the questions better and learned words more effectively. (Participant 19)

> I found the games very useful and I enjoyed playing them. I also became very ambitious and started to actively participate in classes. (Participant 8)

> I think playing games was very useful, we both had fun and learned vocabulary. (Participant 21)

Perceived Choice. When asked whether they believe they had some choice about playing the games or whether they felt like it was not their own choice to play the games, all of the interviewees indicated that they played the games because they wanted to and thus it was their own choice because they felt that the games were exciting, fun, and effective in learning vocabulary:

> I played the games willingly as they seemed exciting and fun to me. (Participant 18)

> We played the games willingly because we knew we would have fun. If we did not feel like playing the games, we would not even want to go to the board. (Participant 3)

> I played the games so willingly because they were fun and because I learned vocabulary better. (Participant 17)

Perceived Competence. When asked whether they felt they were satisfied with their performance at the digitally gamified activities, most of the interviewees (N=21, 84%) stated that they felt pretty competent and skilled at the activities:

> I felt very successful in the games. For example, in the games we played as a group, I knew the correct answers to the questions and they did not. So, they asked me for help, and it felt good. (Participant 6)

> I was satisfied with my performance in the games, and I improved my vocabulary thanks to the games. Also, when I moved from a lower level to a higher level, I felt I was very good at English. In this way, I gained self-confidence and became more enthusiastic. (Participant 12)

A minority of interviewees (N=4, 16%) mentioned that they could not do very well at the digitally gamified activities. For example, one interviewee said:

> I was not satisfied with my performance in the group because everyone answered before me. I made mistakes in most questions. I could only answer some correctly. (Participant 16)

Tension. The majority of interviewees (N=20, 80%) stated that they felt tense while doing the digitally gamified activities, mostly due to time pressure and difficult questions:

> I felt tense while playing the games because of the time pressure. When I see that the time is running out, I panic because I need to respond quickly. (Participant 1)

> When there is a question that I do not know the answer to, I get nervous and I get scared of not being able to do it. (Participant 10)

Others (N=5, 20%) mentioned that they were relaxed in doing these activities. As one interviewee put it:

I was not stressed because I played the games for fun. (Participant 15)

Relatedness. When asked about their collaboration and interactions with their classmates while playing the digitally gamified activities, 18 interviewees (72%) indicated that they had positive interactions:

> We had a great time playing games with our friends. I was very happy that our friends congratulated us and were proud of us when we won the game. (Participant 23)

> We interacted very well with my friends in group work and we always helped each other. (Participant 3)

Other interviewees (N=7, 28%) stated that they had disagreements with their classmates in group games. As one interviewee commented:

> There were too many disagreements in group games and I could not trust the answers my friends gave. (Participant 10)

The findings with regard to the motivation of learners suggest that learners were intrinsically motivated to learn vocabulary through digital gamification. For instance, all of the learners enjoyed the digitally gamified vocabulary learning process, found learning vocabulary through playing digital games interesting, thought that it was important for them to do well at the digitally gamified vocabulary tasks, found the games useful, and felt that they had some control over playing the games. The findings further demonstrated that although most of the learners thought they were pretty skilled at the digitally gamified vocabulary tasks, a minority of them thought there were some tasks that they could not do very well due to time constraints. It was also revealed that although some interviewees stated that they did not feel nervous at all while playing the digital games, most of them felt tense due to challenging questions and restricted time. Finally, the findings showed that most of the learners interacted well with their peers while playing the digital games.

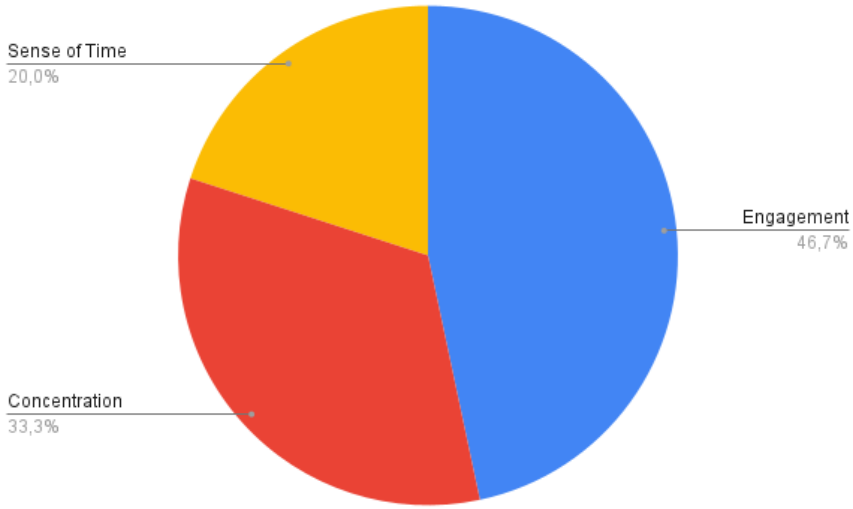
Flow State. The following research sub-question was addressed regarding the flow state:

3.3. What are young EFL learners' attitudes towards using digital gamification in learning vocabulary with regard to the flow state?

According to Csikszentmihalyi's (1975) Flow Theory, a state of flow can be achieved when an individual is fully immersed in an activity. Since it is an important theory that also applies to gamification, the interviewees were asked about how concentrated they were while playing the digital games. While concentration was a pre-determined sub-theme, other related sub-themes, engagement and sense of time, emerged from the analysis.

Figure 38

Components of Flow State



Engagement. Most of the interviewees (N=21, 84%) stated that they were actively involved in learning vocabulary through playing digital games:

> I was highly motivated and ambitious thanks to the rewards we earned in the games. In the past, I did not want to participate in English classes. Now, English classes have become fun. Thus, I raised my hand more often in English classes and I was actively involved in the activities. (Participant 2)

> The more I played the games, the more excited I became and I started to be more engaged in English classes. I became more self-confident and ambitious. I always

> wanted to learn new words, raise my hand, and answer the questions correctly. (Participant 9)

Concentration. Almost two-thirds of the interviewees (N=15, 60%) indicated that they were completely involved in the digital games because they considered that the games were fun, interesting, and exciting:

> I focused very well because the games were so fun and interesting that they held my attention completely. Thus, I answered most of the questions correctly. If I had not been able to focus, I would have performed very poorly. (Participant 14)

> I concentrated very well while playing the games because the games were incredibly exciting. Also, I wanted to rank first. Therefore, I did not let other things distract me. (Participant 8)

Others (N=10, 40%) mentioned that they had difficulty concentrating because of the noise in the classroom during the activities and time pressure:

> While I am trying to answer the questions, my friends are talking to each other saying "the right answer is this, the wrong answer is that" and it distracts me a lot. When everyone is silent, I can focus very well but there is often noise in the classroom, which makes it very difficult to focus. (Participant 25)

> I got distracted when I panicked about running out of time. (Participant 1)

Sense of Time. 9 interviewees (36%) stated that they had a distorted sense of time while playing the digital games:

> Time flew by while I was playing the games. I was so focused on the game that I did not realize time was passing. (Participant 12)

> While playing the games, time passed so quickly that I did not realize when the lesson ended. (Participant 4)

These findings demonstrate that most of the learners had active engagement and complete involvement in the digitally gamified vocabulary learning process. Furthermore, some of the interviewees even stated that they were so immersed in the games that they lost the track of time. Thus, the findings suggest that digital gamification enables learners to experience the flow state in their vocabulary learning process. Considering the learners who reported that they could not focus because they were distracted by the noise in the classroom, it is important to note that this physical condition should be avoided.

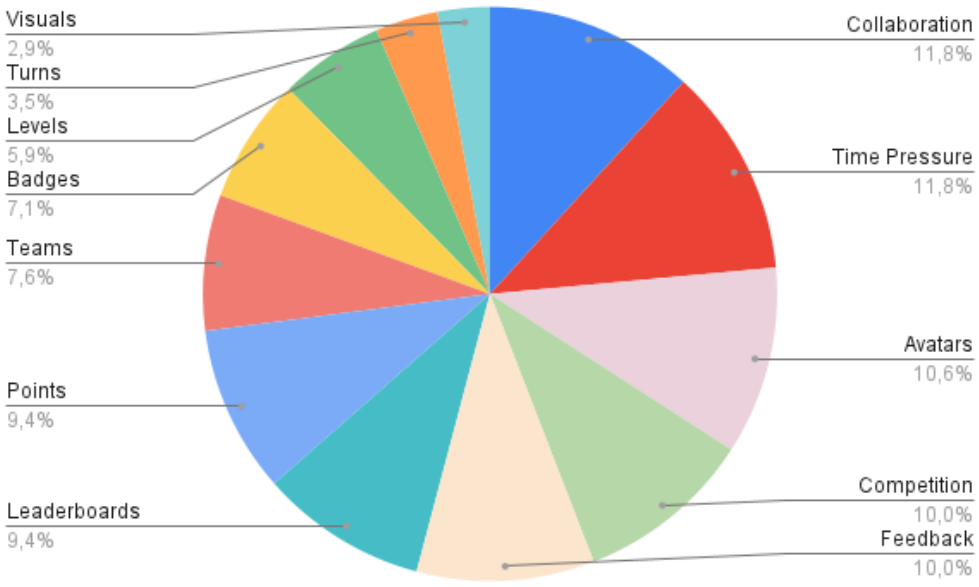
Game Elements. The following research sub-question was addressed with regard to game elements:

1.1. What are young EFL learners' attitudes towards using digital gamification in learning vocabulary with regard to gamification elements?

In response to Question 3, which was about the effectiveness of different game elements, a range of responses were elicited and twelve distinct game elements were identified as recurring throughout the dataset.

Figure 39

Game Elements



Collaboration. Of the 25 interviewees, 20 (80%) reported that they worked in collaboration with each other, especially in group games and helping each other with the words they did not know:

> I loved the games where we worked collaboratively. We chose a mascot for our group, named him “lion”, and worked with team spirit. We helped each other in the group to rank first. I politely told the correct answers to my friends who made mistakes. They also corrected my mistakes. (Participant 2)

> My friends helped me with the missing words in the QR code game. We taught each other the words we did not know. We learned to work collaboratively. (Participant 21)

Time Pressure. Another recurrent sub-theme of game elements in the interviewees was time pressure, as indicated by 20 interviewees (80%), both in a both positive and negative sense with specific reference to ambition and stress:

> While trying to answer the questions, when the time runs out or when we get that question wrong and it is the other group’s turn, I feel more motivated and ambitious than my friends, and then I can answer the question correctly. The limited time makes me very excited. (Participant 4)

> While playing against time, I get stressed if I cannot give the right answer in time because when the time runs out, I miss a turn and get upset. Therefore, I try to focus well on the activities with time constraints and answer the questions immediately without letting my friends distract me. (Participant 8)

Avatars. As another sub-theme coming up in the discussions of game elements, avatars was found effective by 18 interviewees (72%) because they felt that they had fun and motivating learning experiences thanks to avatars:

> I liked the avatars the most because there was a wide range of them and all of them were very beautiful. For example, we chose a penguin in one game, a shark in

> another, and a strawberry in another. It made the game so much fun. (Participant 24)
>
> I like Duolingo's avatars the most because we can change the color of their hair, eyes, skin, and background. Also, there are lots of clothes. I feel valuable when I see my own avatar and thus play with more motivation. (Participant 7)

Competition. Another recurrent sub-theme in the interviews was a sense of competition, with 17 interviewees stating that they liked the competitive nature of games and were eager to do better than others to win in the digital games, with specific reference to leaderboards and points:

> In my opinion, the games were very nice and enjoyable. It excites and entertains me to see myself getting ahead of my competitors on the leaderboard. This makes me eager to learn other words. (Participant 4)
>
> When I gain points, I realize that I have gotten ahead of my competitors, and I understand that I have learned and improved a lot. I see that I am ahead and others are falling behind and this excites me very much. I always want to be first on the leaderboard. (Participant 10)

Feedback. 68% of those who were interviewed (N=17) indicated that they found the immediate feedback provided by games effective because they felt that it encouraged engagement, boosted their motivation, and improved their vocabulary:

> When we get a question wrong, the screen gives the correct answer and then we learn the correct answer. When feedback comes in the form of "excellent", "good", or "bad", instead of ticks and crosses, I become more eager to do it. In this way, when I encounter the same question again, I become able to answer it correctly. (Participant 7)
>
> It is very nice to learn with feedback when I do not know the answers to the questions. I feel that my English is improving. Since I realize my mistakes, I revise

> the topics again and it becomes more useful and motivating. For example, when Duolingo calls my performance “excellent” or congratulates me, I write it down on a piece of paper and repeat it. Thus, it stays in my mind. When it says my performance is bad, I get more ambitious and work harder. (Participant 8)

Leaderboards. Almost two-thirds of the participants (64%, N=16) reported that leaderboards added a competitive edge to the digitally gamified vocabulary learning process and motivated them to learn more words to get ahead of their classmates and climb to the top of the leaderboard:

> I wanted to reach the top of the leaderboard by earning more XPs. My goal was to reach the Diamond league by completing the lower ones such as Bronze, Silver, and Gold. I was at the bottom of the leaderboard once, but I did not get demoralized, on the contrary, I got more ambitious and worked harder to get ahead of my friend at the top. (Participant 11)

> As I move up the leaderboard, I feel better and more advanced. When I rank first, I want to move on to higher leagues and tournaments. I was in the second place once and tried to get ahead of my friend. Then, I took the first place. Also, I was very happy when I saw our team’s avatar in the first place on the screen in the [Jeopardy] game. (Participant 13)

Points. 64% of the interviewees (N=16) stated that earning points motivated them to learn more words, made games more competitive, and provided feedback on how well they are doing:

> In the game we played as a group, we deliberately chose difficult questions so that our daisies team would win because difficult ones were worth 300 points. In fact, it would have been better if there were questions worth 500 or 1000 points. It is very important to answer difficult questions correctly because this way we get a higher score than others and our team wins first place. (Participant 9)

> When I earn points, I feel extremely happy and successful and want to earn more and more, so I work harder and try to learn more English words. I feel that I have accomplished something important and I love it when I earn points and move up to the next level. I feel like I am in a competition. (Participant 18)

Teams. Over half of those interviewed (52%, N=13) mentioned that they liked to be a member of teams, worked together with their teammates to win, and helped each other with the words they did not know:

> I liked the team games very much. We were divided into teams and played highly enjoyable games. We learned to work together as a team. I got excited to help my team when they did not know the words. Two heads are better than one. (Participant 8)

> We learned better and had more fun when we played games as a team because we got excited and wanted to be able to answer the questions immediately. We worked harder to come top of the class. (Participant 14)

Badges. 12 interviewees (48%) indicated that badges motivated them to work harder, made the vocabulary learning process more enjoyable, helped them gain a sense of competence, and increased their motivation:

> I think earning badges is a lot of fun and makes the game more enjoyable. I feel successful when I earn a badge and gain self-confidence that I will be even more successful. It teaches me that I can raise my hand more ambitiously, even for the questions I am bad at. (Participant 19)

> I think it is great to earn a badge in return for our success. Earning awards thanks to the words I know both increases my motivation and makes me happy. Thus, I can progress steadily and improve my English further. (Participant 3)

Levels. 40% of the interviewees (N=10) reported that levels made their vocabulary learning process more enjoyable, enhanced their vocabulary, and excited their interest and held their attention:

> Leveling up was my main ambition. As I went from a lower level to a higher level, I got ambitious and wanted to level up more. When I could not level up, I got upset and angry. It was also a lot of fun because every time we answered correctly, we advanced to the next level and the words became more difficult. It was both fun and gripping. (Participant 9)

> I felt so good every time I leveled up. I think it improved my skills. When I could not complete a level, the game made me start from the beginning and explained it in more detail. Thus, I understood things that I did not understand before. (Participant 7)

Turns. As another sub-theme emerging from the data, turns was mentioned by 6 interviewees (24%):

> When time ran out before we could answer, the other group answered the question. So, we became more ambitious and tried to answer the next questions quickly. (Participant 22)

> I liked that we took turns answering the questions in the games. I felt very enthusiastic when it was my turn to answer the question after my friends in other groups could not answer the question correctly. (Participant 17)

Visuals. Another sub-theme that emerged from the data was visuals, with participants (N=5, 20%) stating that visuals helped them learn and remember the words better, attracted their attention, motivated them, and made the learning process more enjoyable:

> I really liked the educational nature of the games and their beautiful appearance and colors. I had fun while finding the words that matched the visuals because even

though I did not know the words, the visuals really motivated me to learn the words. (Participant 5)

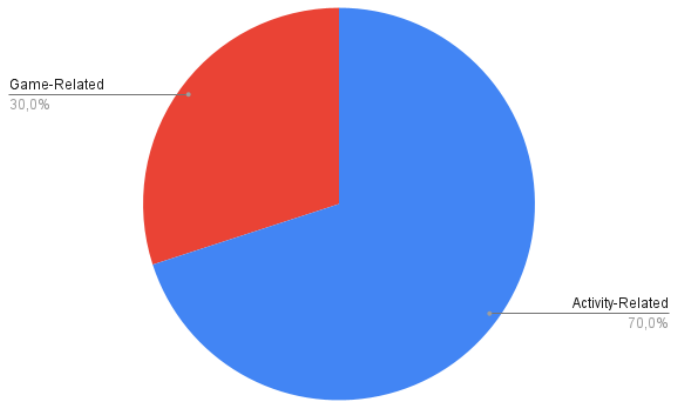
The games attracted my attention because they were colorful and fun, which made me more enthusiastic about learning English. It is more memorable because when we see a word, we recognize it as a color and we remember what we did. (Participant 24)

Overall, these findings indicate that game elements motivate learners, engage them in the vocabulary learning process, and provide them with more effective learning experiences. Although time pressure was perceived as negative by some learners, one learner stated that it kept him focused on the task and encouraged him to respond faster instead of being distracted by other things. The findings also suggest that the combination of various game elements can provide learners with a richer learning environment.

Challenges. With regard to the challenges faced by interviewees in their process of digitally gamified vocabulary learning, two discrete sub-themes were determined depending on whether the challenges result from vocabulary activities in games or games themselves. While 20 interviewees (80%) reported that they found digitally gamified activities or digital games challenging, 5 interviewees (20%) did not find anything related to digital gamification challenging.

Figure 40

Challenges Related to Activities and Games



Activity-Related Challenges. Just over half of those interviewed (N=14, 56%) reported that certain activities were challenging due to various factors including memory load and medium of instruction:

> I had difficulty with the puzzles where we clicked on the cards and tried to find their pairs because I could not keep the cards in my mind and got confused. I think the words in the science unit were the most difficult ones. (Participant 3)

> What I had difficulty with during the activities was that the questions were asked in English. It would have been better if the questions were in Turkish. (Participant 24)

Game-Related Challenges. A small number of interviewees (N=6, 24%) argued that some games were difficult to play with due to various issues including the orientation of cards and game rules:

> Even though I answered the questions correctly in the QR code game, it looked like I answered them wrong when I looked at the results because I could not hold up my card correctly. I had a little difficulty until I got used to it. (Participant 6)

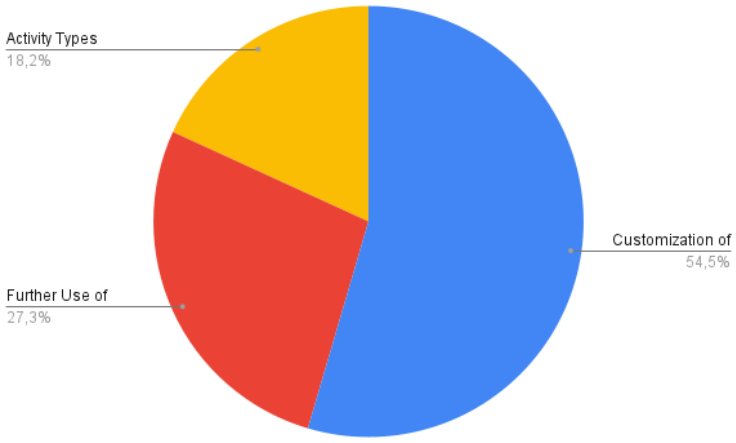
> Some games were difficult because time passed quickly and time ran out until I found the correct word. Also, I had difficulty understanding the rules of the games we played as a team. (Participant 10)

These results indicate that some of the learners interviewed faced challenges related to vocabulary learning tasks such as the difficulty of the questions and digital games such as time constraints and game rules while others did not encounter such challenges.

Suggestions. Of the 25 participants who were interviewed, 11 (44%) provided various suggestions on how to improve the process of digitally gamified vocabulary learning while 14 of them (56%) did not made any suggestions. Since the interviewees were not asked about their suggestions, this theme and its sub-themes were not pre-determined, but rather emerged from the data.

Figure 41

Suggestions



Customization of Game Elements. Most of those (24%) who made suggestions expressed the need for customizing the game elements, with specific reference to avatars and badges:

> I would like to create an avatar from scratch that looks like me instead of choosing from pre-made avatars for all the games just like we did on Duolingo. For example, I would like to be able to change the hairstyles, eye colors, clothes, accessories, height and weight of the mascots on Jeopardy. It would also be nice if we could upload our photo as a group or photos of celebrities like football players and scientists as our avatars. (Participant 7)

> It would be great if we could change the colors and shapes of the badges we earn. If you made a photocopy of the badges, cut them out and gave them to us, we would be very excited. (Participant 8)

Further Use of Digital Gamification in English Classes. 3 of the interviewees (12%) mentioned that games should be used more in English lessons to enhance language skills:

> I think more English games should be created and continued to be played in the classroom. We should also do more listening and speaking activities with games. I

> think English games should always be played as they are fun, educational, and something everyone can play. (Participant 9)
>
> I think we should learn not only words but also other things through games. I want the games in English classes to never end. We should play and replay games in all English classes because this way we can learn a lot. (Participant 23)

Activity Types. A minority of participants (N=2, 8%) stated that there needs to be changes in the types of activities:

> I think English words should be matched with their meanings. (Participant 7)
>
> I think we should hear how the words are pronounced when we click on them in all games, as in Duolingo and Busuu. We can match words with pictures by listening. (Participant 11)

These findings indicate that digital gamification applications can be improved in terms of the customization of game elements and variety of activities. Furthermore, the findings indicate that further use of digital gamification in English classes can provide them with a richer learning environment.

Discussion

The results of the study show that although the groups did not have baseline differences, learners in the digitally gamified vocabulary learning group significantly outperformed those in the control group both in the post-test and delayed post-test, which indicate that digital gamification was more effective in enhancing young EFL learners' vocabulary learning and retention than non-digitally gamified vocabulary learning and retention. The quantitative results are also supported by the qualitative results, which indicated that digital gamification was mostly perceived positively and most of the learners who received digitally gamified vocabulary instruction found the digitally gamified learning experience effective. This section will discuss the quantitative and qualitative results of the current study with reference to those of previous research.

Discussion of Quantitative Results

The first research question in this study sought to determine the effect of digital gamification on young EFL learners' vocabulary learning. The results of the vocabulary test revealed that although both digital gamification and traditional methods led to a significant improvement in the post-test as compared to the pre-test, digital gamification was more effective in enhancing young EFL learners' vocabulary learning than traditional methods in that learners in the digitally gamified vocabulary learning group significantly outperformed the learners in the control group in the post-test, although their pre-test scores were not significantly different. The results of the current study are consistent with the results of other research which found that gamification had a significant positive effect on learners' vocabulary learning (Doğan, 2023; Ertürk, 2023; Hazar, 2020; Liu et al., 2024). These results are also consistent with what Foroutan Far and Taghizadeh (2022) found about the effect of gamification on collocation learning, which plays an important role in vocabulary learning. However, the results of the current study are not in line with those of Avila and Fonseca (2021), who found that the immediate post-test scores of the gamified vocabulary learning group were not significantly different from those of the traditional, non-digital vocabulary learning group. This inconsistency might be attributed to the fact that the current study was conducted with young learners while the participants in Avila and Fonseca's (2021) study were 9th graders, indicating that gamification may not be as effective in older age groups as it is in young learners in terms of vocabulary learning. The current study used digital gamification while Avila and Fonseca (2021) used non-digital gamification. Apart from age-related differences, therefore, the inconsistency might have resulted from the type of gamification implemented in the two studies.

The second research question in this study was concerned with the effect of digital gamification on young EFL learners' vocabulary retention. The pairwise comparisons within each group revealed that although both groups had a significant increase in their scores from the pre-test to delayed post-test, they had a significant decrease in their scores from

the post-test to delayed post-test, indicating that both groups were unable to maintain the same level of vocabulary learning gains in the long-term. This finding was unexpected in that gamification was argued to have a positive impact on learners' knowledge retention (Putz et al., 2020).

On the other hand, the between-group comparison revealed that digital gamification led to a higher level of long-term vocabulary retention as compared to traditional methods since learners in the digitally gamified vocabulary learning group significantly outperformed those in the control group in the delayed post-test. In other words, although both groups' scores significantly decreased from the post- to the delayed post-test, the digitally gamified vocabulary learning group had a smaller decline compared to the traditional vocabulary learning group. The results of the current study are consistent with those of previous studies which reported that gamification had a significant positive effect on learners' vocabulary retention (Ertürk, 2023). However, the results are in contrast with some studies. For instance, Ertürk (2023) found no significant difference, except a significant increase in the collaborative gamification group's meaning recall, from post- to delayed post-test scores of all the three groups with regard to meaning recall and recognition. Since the results showed that none of the groups had a significant decrease from post- to delayed post-test, it can be suggested that all groups in Ertürk's (2023) study maintained their vocabulary improvement. The current study, however, revealed that there was a significant decline in the scores of the experimental and control group from post- to delayed post- test, suggesting that neither group was able to retain the same level of vocabulary learning gains in the long term. The difference between the results of the two studies might be attributed to the fact that working memory and long-term memory improve with age and that young learners' limited working memory capacity constrain their long-term memory (Forsberg et al., 2022). Also, the results of the current study contradict with those presented by Avila and Fonseca (2021), which revealed that the delayed post-test scores of the gamified vocabulary learning group were not significantly different from those of the control group. The results of the current study

with regard to vocabulary retention also seem to contradict with those presented by Young and Wang (2014), who found that learners who learned vocabulary and pronunciation only with drills achieved better results than those learned vocabulary and pronunciation with drills and game-based activities in the delayed vocabulary retention test. This inconsistency between the studies might be attributed to the fact that the delayed post-test that was administered to measure vocabulary retention in the current study was administered 6 weeks after the implementation of the post-test while Avila and Fonseca (2021), Ertürk (2023), and Young and Wang (2014) provided shorter time intervals between the two tests, which were 3 weeks, 2 weeks, and 1 week respectively.

Discussion of Qualitative Results

The third research question was about young EFL learners' opinions on and attitudes towards their digitally gamified vocabulary learning experiences. Overall, the semi-structured interview findings revealed that they had positive attitudes towards the use of digital gamification in vocabulary learning process and that they found digital gamification effective. These findings are consistent with those of previous research (Dehghanzadeh et al., 2019; Doğan, 2023; Ertürk, 2023; Lui, 2014; Turgut & İrgin, 2009).

A major theme in the thematic analysis results was vocabulary learning, which indicated that learners had positive attitudes towards learning with gamification, which is consistent with the results of previous studies (Avila & Fonseca, 2021; Dehghanzadeh et al., 2019; Doğan, 2023; Ertürk, 2023; Lui, 2014; Foroutan Far & Taghizadeh, 2022; Liu et al., 2024; Predyasmara et al., 2022; Qiao et al., 2024; Turgut & İrgin, 2009; Young & Wang, 2014). More specifically, nearly all of the interviewees found digitally gamified vocabulary learning more effective than traditional vocabulary learning. This finding corroborates the ideas of Prensky (2001), who claimed that traditional content is not motivating to digital natives who were surrounded by digital technology since birth. Furthermore, the theme revealed that most learners preferred collaborative vocabulary learning to individual vocabulary learning. This result seems to contradict with that of Quoi et al. (2024), who

found that competitive gamification was more effective than collaborative gamification because team leaderboards did not show learners' individual contributions. This, however, is similar to the reason why some learners in the current study preferred individual gamification: collaborative gamification lacked personalized results and feedback. As Quoi et al. (2024) suggested, this problem can be solved by adding personal leaderboards for collaborative games too in order to enable learners to get recognition from their friends for their individual contributions to collaborative efforts. In context of Vygotsky's (1978) Sociocultural Theory, the fact that most interviewees collaborated with each other, shared knowledge, helped each other, and learned from each other shows that they were provided with scaffolding by more knowledge others, i.e., their peers, within their ZPD and thus they were able to complete the activities with the assistance of their peers. The results also showed that most learners were willing to accept their teammates' opinion, which corroborates Tudge's (1990) ideas on the effectiveness of peer-peer interaction.

Similar to the vocabulary learning theme, the vocabulary retention theme demonstrated that nearly all interviewees found digitally gamified vocabulary retention more effective than traditional vocabulary retention, mostly due to spaced repetition and game elements such as visuals. The findings with regard to vocabulary learning and retention are similar to Lui's (2014) survey results where a majority of learners stated that they preferred online games to worksheets in learning and reviewing vocabulary because, as the participants reported, playing games was more fun, exciting, and interesting, and it facilitated vocabulary retention. The results are also consistent with those presented by Qiao et al. (2024), who found that gamification enhanced long-term knowledge retention. The findings are further in line with those advanced by Nation (2022), who stated that spaced repeated encounters with the target words fosters vocabulary learning and retention.

Learners in the current study also found gamified vocabulary learning highly motivating, which is in line with other studies in the literature (Avila & Fonseca, 2021;

Foroutan Far & Taghizadeh, 2022; Liu et al., 2024; Predyasmara et al., 2022; Qiao et al., 2024; Sailer et al., 2017; Young & Wang, 2014; Zainuddin, 2018). More specifically, in regard to intrinsic motivation, all interviewees found digitally gamified vocabulary learning enjoyable, interesting, important, useful, and felt that they had some choice about performing the digitally gamified activities. These are in line with the questionnaire findings of Predyasmara et al. (2022), who revealed that gamification led to a significant improvement in learners' intrinsic motivation towards learning English. The results are also in line with those presented by Qiao et al. (2024), which revealed that most learners found gamified learning fun, enjoyable, and rewarding. The interview further revealed that most learners in the current study stated that they had a sense of competence and improved their social skills, which are also in line with the findings of previous studies (Predyasmara et al., 2022; Sailer et al, 2017; Zainuddin, 2018). Based on their interview results, Foroutan Far and Taghizadeh (2022) also stated that learners are intrinsically motivated to learn without feeling forced to do so thanks to incentives such as game elements. It was also found that most learners in the current study felt tense while playing the games. Foroutan Far and Taghizadeh (2022) also found that a minority of the learners found gamification too stressful. However, this finding seems to contradict with the semi-structured interview results reported by Liu et al. (2024), which revealed that digital gamification decreased learners' stress. Most learners also stated that gamification improved their social skills and interaction with their friends, which is consistent with the results obtained by Sailer et al. (2017).

With regard to flow state, most learners indicated that they were highly engaged in the games because they found the games fun, exciting, and motivating. The results align with Csikszentmihalyi's (1990) flow theory, which suggests that optimal experience takes place when individuals are fully engaged in a task. These results are also in line with those of previous studies which found that gamification enhanced learners' engagement (Avila & Fonseca, 2021; Doğan, 2023; Ertürk, 2023; Foroutan Far & Taghizadeh, 2022; Qiao et al.,

2024; Zainuddin, 2018). Furthermore, most learners in the current study indicated that they concentrated fully on the gamified activities because they found games fun, interesting, and exciting. These results are also consistent with Foroutan Far and Taghizadeh's (2022) results, which indicated that most learners in the gamified groups were completely absorbed in the games. Finally, some learners in the current study stated that they lost track of time while playing the games because of the absorbing nature of games and high level of concentration, which is also consistent with Foroutan Far and Taghizadeh's (2022) results, which revealed that the digital gamification group forgot about time and place because they were highly focused on the games. Overall, the results with regard to the sense of flow demonstrate that learners' intense concentration led to a distorted sense of time, which aligns with what Csikszentmihalyi (1990) advanced as optimal experience.

Most game elements were perceived positively by learners in the current study, which is consistent with the results of previous research (Qiao et al., 2024). First of all, the results showed that points, badges, and leaderboards, or "the PBL triad" (Werbach & Hunter, 2012, p. 72) motivated learners to complete activities, encouraged competition, provided effective feedback, and provided learners with a sense of competence, which are consistent with what Werbach & Hunter (2012) presented about the up-sides of a successful gamification toolkit (pp. 72-73). Furthermore, these results are consistent with those of Sailer et al. (2017), who found that badges and leaderboards enabled learners to experience a significantly higher level of competence. Moreover, the results indicated that avatars provided learners with a motivating learning experience in which they had fun choosing from a variety of avatars together, and teams enabled learners to work in collaboration with their teammates and help each other to complete the activities. These are consistent with the results presented by Sailer et al. (2017), which indicated that avatars and teammates fostered learners' experiences of social relatedness. However, the results regarding perceived choice are not in line with the findings of Sailer et al. (2017), which demonstrated that perceived decision freedom was not affected by avatars as intended.

Learners in the current study also stated that the visuals and colors in gamified vocabulary activities enabled them to learn and remember vocabulary items better, which corroborates the idea that introducing vocabulary in various contexts and forms including textual, spoken, and pictorial fosters vocabulary learning (Ebrahimzadeh et al., 2016; Nation, 2022; Yu & Trainin, 2022). Taken together, these results suggest that a meaningful combination of different game design elements enables learners to satisfy their basic psychological needs put forward by the Self-Determination Theory (Ryan & Deci, 2000b; Ryan & Deci, 2002) by engaging them in effective gamification experiences.

With regard to the challenges they encountered in the digitally gamified vocabulary learning process, most interviewees stated that they found the vocabulary activities challenging mostly due to time pressure. However, when asked about whether they felt competent while completing the activities, most of them stated that they had a sense of competence. This is in line with Csikszentmihalyi's (1990) flow theory, which suggests that an individual's skills to overcome the challenges should be balanced with the challenges. Some of the interviewees stated that they found the games' features complicated and felt demoralized. This aligns with Davis' (1989) Technology Acceptance Model, which suggests that perceived ease of use has an effect on individuals' technology acceptance and usage. This suggests that challenges related to the usability of games might demotivate learners.

Finally, some learners provided suggestions to improve digitally gamified vocabulary learning experiences. A suggestion made by learners was to customize and personalize game elements, which might be related to the fact that customization provides opportunity for individuals' self-expression by enabling them to decorate their avatar or character (Klock et al., 2020). Some learners also stated that they would like to use digital gamification in their English classes not only in learning vocabulary but also in learning other skills.

Taken together, these semi-structured interview results suggest that there is an association between the use of digital gamification in young EFL learners' English classes and enhanced vocabulary learning and retention. The fact that learners' preferences

showed differences confirms that even learners in the same language learning class can differ from each other in a number of ways including their motivations, strategies, and preferences regarding the approaches and activities implemented in the classroom (Richards & Rodgers, 2014). Furthermore, the results also corroborate the ideas of Gardner (2011), who suggested that young learners also differ from each other as they differ from adults, and they have major individual differences in terms of their abilities, needs, preferred learning approaches, and types of intelligence.

In light of what has been mentioned so far, a combination of various game elements for learners with different learning styles, opportunities for collaboration, and a suitable learning environment can increase young learners' both intrinsic and extrinsic motivation and enable them to learn and retain vocabulary effectively. Therefore, these results provide important insights into teaching vocabulary to young EFL learners.

Chapter 5

Conclusion and Suggestions

This chapter is dedicated to summarize and give a final comment on the significance of the results, discuss the implications of the results for practice, and suggest areas for further investigation based on the results and limitations of the current study.

Conclusion

This study set out with the aim of investigating the effect of digital gamification on young EFL learners' vocabulary learning and retention, and explore their opinions on digitally gamified vocabulary instruction. With this aim, young EFL learners who take 2 hours of English classes weekly in a primary school were divided into the experimental and control group. The learners in the experimental group received digitally gamified vocabulary instruction while those in the control group continued to learn vocabulary with their usual traditional learning methods that did not involve any type of gamification.

In this investigation, the aim was to assess whether there was a significant difference between the vocabulary gains of the digital gamification group who learned vocabulary with digitally gamified activities and the traditional learning group who learned vocabulary with non-digital, non-gamified, and non-digitally gamified activities. With this aim, the researcher developed a vocabulary test, piloted it in another primary school, and implemented it in the main study as the pre-test, post-test, and delayed post-test. In order to explore the effect of digital gamification the learners' vocabulary learning and retention in more depth, the researcher developed and conducted a semi-structured interview with the learners in the experimental group.

The results of the vocabulary tests showed that although both groups significantly improved from the pre-test to the post-test, the experimental group significantly outperformed the control group in both immediate post-test and delayed post-test, indicating that digitally gamified vocabulary learning led to a significantly higher level of vocabulary

learning and retention than traditional vocabulary learning. The quantitative results were also supported by the qualitative findings of the semi-structured interview, which indicated that digital gamification had a positive effect on young EFL learners' vocabulary learning, retention, and attitudes towards vocabulary learning.

Overall, when the quantitative results are combined with the qualitative ones, the study suggests that digital gamification is an effective approach that can not only enhance young EFL learners' vocabulary learning and retention but also foster their motivation, sense of flow, and engagement throughout the learning process.

Pedagogical Implications

The results of this study have a number of important pedagogical implications for the use of digital gamification in young EFL learner classes. First, digital gamification can be used as an effective method for increasing young EFL learners' engagement, sense of flow, and motivation to learn vocabulary through a variety of game elements such as collaboration, time pressure, avatars, competition, feedback, leaderboards, points, badges, levels, turns, and visuals, which can make the learning process enjoyable, interesting, and interactive.

An important implication of the study is that teachers should integrate digital technologies in young EFL learners' classes. This implication emerged from the findings of the current study, which revealed that digitally gamified vocabulary learning group significantly outperformed the traditional, non-digitally gamified vocabulary learning group both in the immediate post-test and delayed post-test and that nearly all interviewees found digitally gamified vocabulary learning and retention more effective than traditional, non-digitally gamified vocabulary learning and retention. Given the results and the fact that traditional content is not motivating to digital natives who grew up in the era of digital technology (Prensky, 2001), teachers need to use technology and gamification in the

classroom to keep learners motivated, foster their engagement, and maximize their opportunities to learn and retain information.

In regard to vocabulary learning and retention, learners in the current study indicated that the colorful nature of games and visuals facilitated their vocabulary learning and retention. In line with the findings and the idea that presenting vocabulary items in a variety of contexts and forms such as audio, textual, and visual maximizes vocabulary learning (Ebrahimzadeh et al., 2016; Nation, 2022; Yu & Trainin, 2022), teachers should incorporate gamification tools that enable learners to notice, use, and reuse the target vocabulary items in meaningful contexts through gamification. Furthermore, the interview findings support the idea that spaced repetition of vocabulary items enhance vocabulary learning and retention (Nation, 2022). Therefore, teachers should create opportunities for learners to review vocabulary items at certain time intervals to foster long-term retention.

Another important implication of the results is that young learners have individual differences in their preferences regarding how digitally gamified vocabulary learning is implemented. This supports the idea that “one size does not fill all”, and that more learner-centered methods and approaches that acknowledge individual differences of learners need to be used instead of traditional teacher-centered ones (Richards & Rodgers, 2014, p. 230). In this regard, digital gamification, if successfully implemented, can address such differences by appealing to different vocabulary learning styles, preferences, and needs by incorporating various game design elements. In order to have a successful implementation, it is important for teachers to ensure that the collaboration of these game elements satisfy learners’ psychological needs that are put forward by Ryan and Deci (2020) (Ede, 2022).

For instance, some learners stated that they would prefer collaborative gamification while others found individual gamification more effective. Since both has their own advantages and disadvantages, an effective implementation of gamification in the classroom should include individual leaderboards as well as collaborative ones to ensure that learners’ individual contributions are recognized (Quoi et al., 2024). Furthermore, it is

also important for learners to notice their personal mistakes so that they can review the specific vocabulary items that they do not know well. In this regard, it is important for teachers to design gamified activities in a way that not only fosters collaboration and teamwork but also values each learner's efforts and personal rankings while also enabling them to review their strong and weak words.

Another implication regarding the study is that teachers should select and design digitally gamified activities that offer optimal learning experiences. In the current study, a number of learners stated that they found the vocabulary activities challenging and that they felt tense mostly due to time constraints. According to Csikszentmihalyi (1975, 1990), individuals can have optimal experiences and a sense of flow if there is a balance between an activity's challenges and their skills to overcome them. However, this does not mean that digitally gamified activities should not be challenging. In fact, optimal learning experiences take place when there are challenges that are "just about manageable" (Csikszentmihalyi, 1998) which keep learners engaged to improve their skills to overcome the challenges without overwhelming them and scaffold them within their ZPD (Davis et al., 2018). In other words, optimal input should be a bit challenging but possible to be managed (Krashen, 1985). Therefore, similar to any kind of learning activities, optimal gamified activities should be designed in a way that prompts learners to increase their skills to deal with the challenges that are a bit beyond their current level. Therefore, teachers need to be careful while choosing the gamification tools and make sure that the gamified activities to be implemented in the classroom are neither too easy nor too difficult for learners' current skills.

There is, therefore, a definite need to incorporate digital gamification into English curricula to provide learners with an effective and interactive learning environment in which they can not only improve their vocabulary skills but also have increased levels of motivation, engagement, and sense of flow.

Suggestions for Future Research

This study investigated the impact of digital gamification on young EFL learners' vocabulary learning. Since this study focused mainly on vocabulary learning and retention, it is recommended that further research be undertaken to explore its effect on the four language skills (i.e., listening, speaking, reading, writing), and components other than vocabulary (e.g., grammar and pronunciation). In this regard, a future study assessing the effect of digital gamification on an integration of different language skills would be interesting. Furthermore, as integrating gamification into education could develop 21st century skills (Lee & Hammer, 2011; Zainuddin, 2018) and digital gamification incorporates critical thinking, creativity, collaboration, and communication, further research regarding its effect on the development of 21st century skills would be interesting.

Moreover, it would be interesting to investigate the effect of digital gamification and game elements on various groups of learners with different ages, proficiency levels, backgrounds, motivations, intelligence types, and learning styles. Since young learners learn differently from very young children, older children, adolescents, adults, and even from other young learners with different ages (Ersöz, 2007; Harmer, 2009, p. 82; Keskil & Cephe, 2001), further studies that take these variables into account need to be undertaken. Future studies could also shed light on whether digital gamification can support vocabulary learning for learners that start from zero compared to those with a certain level of proficiency. Thus, gamification can be used in a way that meets learners' specific needs, interests, strengths and weaknesses by adjusting to their individual differences.

Since this quasi-experimental study used pre-existing classes, random assignment was only possible at the cluster level, not at the individual level. It is therefore suggested that a true experimental design in which participants are randomly assigned to the conditions is used in future studies to increase internal validity. Moreover, it would be worthwhile to use probability sampling method to ensure that each individual in the target population has an equal chance of being selected for the study and thus avoid sampling

bias, lead to a more representative sample and more generalizable results, and increase external validity.

In this study, there were 6 weeks between the immediate post- and the delayed post-test due to time constraints. In future studies, this time interval can be longer and thus the effect of digital gamification on long-term vocabulary retention can be measured more precisely.

Furthermore, this study incorporated both AI-powered and non-AI-powered digital gamification tools and platforms. It would be interesting to compare the effects of AI-powered versus non-AI-powered digital gamification to determine if tailoring the content and difficulty of gamified tasks to learners' needs, strengths and weaknesses has an effect on their language learning.

Finally, although the sample size was estimated to be adequate for the current study, it is suggested that further experimental studies are carried out with a larger sample size in order to be better representative of the target population and provide more accurate inferences. In conclusion, it is recommended that further research be carried out with groups with different characteristics, in new settings, and at later times in order to minimize the threats to external validity regarding the interaction of selection, setting, and history with treatment (Creswell, 2012; Creswell & Creswell, 2018).

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APPENDIX-A: Vocabulary Test

VOCABULARY TEST

... / ... / .....

Class: .....

Nickname: .....

A. For questions 1-15, choose the correct option. (15 x 2 = 30 points)

1) Look at the pictures and choose the correct option.

They can , but they can't

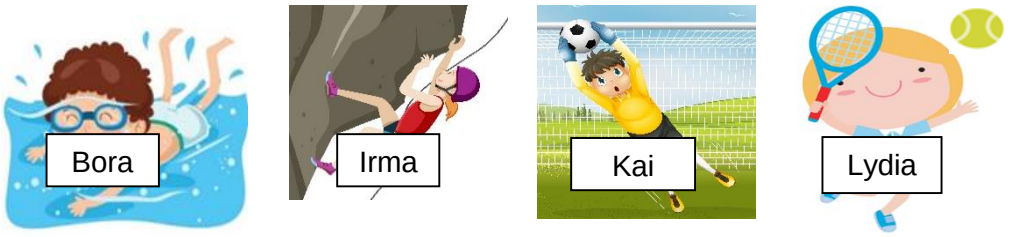
A) ride / drive B) carry / row C) climb / play D) jump / dance

2) Read the text. Choose the correct option.

Hello! My name is Tori. I can ....1.... high and ....2.... fast but I can't ....3.... . I always ....4.... people.

	1	2	3	4
A)	climb	help	run	jump
B)	jump	run	climb	help
C)	run	jump	help	climb
D)	help	climb	jump	run

3) Look at the pictures and choose the correct option.



A) Bora can drive.
B) Irma can climb.
C) Kai can read.
D) Lydia can sing.

4) Read the dialogue and choose the correct option.

What do you like doing in your .....1.....?

I like watching cartoons. It is my ……2…… .

	__1__	__2__
A)	free time	favorite activity
B)	cartoon character	favorite game
C)	favorite activity	cartoon character
D)	favorite game	free time

5) Read the dialogue. Choose the correct option.

Do you like sports?

Yes, I like _____.

A) singing B) drawing C) reading D) swimming

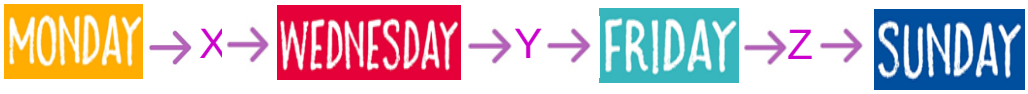
6) Look at the pictures and choose the correct option.

They like , but they dislike

A) riding / drawing B) singing / dancing

C) learning / planting D) reading / coloring

7) Order the days of the week and choose the correct option.



	__X__	__Y__	__Z__
A)	Thursday	Tuesday	Saturday
B)	Tuesday	Thursday	Saturday
C)	Thursday	Saturday	Tuesday
D)	Tuesday	Saturday	Thursday

8) Read the dialogue below and choose the correct option.

X: What time is it?
Y: It is **eight o'clock**.

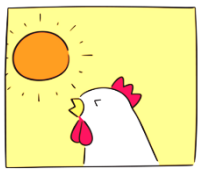
A) 

B) 

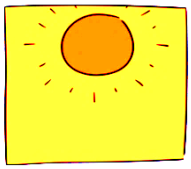
C) 

D) 

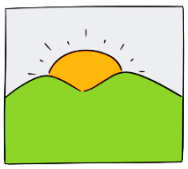
9) Look at the pictures and choose the correct option.



A) morning



B) evening



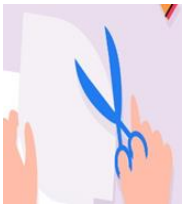
C) night

D) afternoon

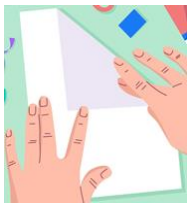
10) Look at the pictures and choose the correct opition.

A) make a hole

B) do an experiment

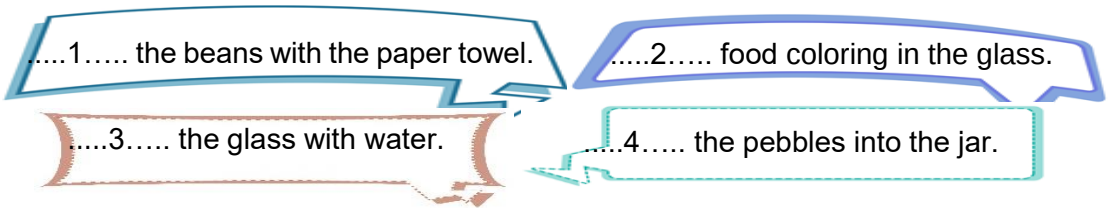


C) fold the paper



D) cut the paper

11) Read the sentences and choose the correct option.



	1	2	3	4
A)	Cover	Drop	Fill	Place
B)	Drop	Cover	Place	Fill
C)	Place	Fill	Cover	Drop
D)	Fill	Place	Drop	Cover

12) Look at the picture and choose the correct option to complete the dialogue.

Ryan: Where is my teddy bear?

Barbara: It is ..... the table.

A) on B) between C) near D) in front of

13) Read the text and choose the correct option.

My mother is a .....1..... . She works at a veterinary clinic. My father works at a post office. He is a .....2..... . My sister is a .....3..... . She works at a music hall. My brother works at a police station. He is a .....4..... .

	1	2	3	4
A)	singer	policeman	postman	vet
B)	policeman	singer	vet	postman
C)	vet	postman	singer	policeman
D)	postman	vet	policeman	singer

14) Look at the pictures. Choose the correct option according to their jobs and likes.

A) planting vegetables

B) helping animals

C) teaching children

D) singing songs

15) Read the dialogue.

What is Lily's job? Choose the correct option.

A) A nurse B) An actress C) A pilot D) A policewoman

B. For questions 1-5, match the words with the pictures and write the letters in the chart. There are three extra words for each question. (5 x 6 = 30 points)

1) Match the activities with the pictures. Write the letters in the chart.

a. speak English
b. climb a tree
c. take pictures
d. read a book
e. drive a car
f. play the piano
g. ride a horse
h. catch a ball
i. sing a song

1- 

2- 

3- 

4- 

5- 

6- 

1	2	3	4	5	6

2) Match the free time activities with the pictures. Write the letters in the chart.

a. planting trees
b. learning English
c. drawing pictures
d. reading comics
e. coloring a book
f. playing table tennis
g. riding a scooter
h. playing football
i. watching cartoons

1- 

2- 

3- 

4- 

5- 

6- 

1	2	3	4	5	6

3) Match the daily activities with the pictures. Write the letters in the chart.

a. go to bed
b. go shopping
c. wake up
d. get dressed
e. go to school
f. have breakfast
g. meet friends
h. do homework
i. go to the playground

1- 

2- 

3- 

4- 

5- 

6- 

1	2	3	4	5	6

4) Match the materials with the pictures. Write the letters in the chart.

a. jar
b. glass
c. pebbles
d. paper towel
e. food coloring
f. cup
g. soil
h. goggles
i. beans

1- 

2- 

3- 

4- 

5- 

6- 

1	2	3	4	5	6

5) Match the jobs with the pictures. Write the letters in the chart.

a. farmer
b. dancer
c. teacher
d. doctor
e. policeman
f. businessman
g. writer
h. chef
i. fireman

1- 

2- 

3 

4- 

5- 

6- 

1	2	3	4	5	6

C. For questions 1-20, fill in the blanks according to the pictures. (20 x 2 = 40 points)

What can they do?

1) She can _ _ _ _ .

2) He can play the _ _ _ _ _ _ .

3) They can do _ _ _ _ _ _ _ .

4) Birds can _ _ _ .

What do they like?

5) They like playing _ _ _ _ _ .

6) He likes flying a _ _ _ _ .

7) She likes riding a _ _ _ _ .

8) He likes playing with _ _ _ _ _ _ _ .

What do they do?

9) I have a _ _ _ _ _ _ .

10) We have _ _ _ _ _ _ in the evening.

11) I _ _ _ _ my face every morning.

12) I brush my _ _ _ _ _ in the morning.

Where is the ball?

13) The ball is _ _ the box.

14) The ball is _ _ _ _ _ _ the box.

15) The ball is _ _ _ _ _ the box.

16) The ball is _ _ the box.

Where do they work?

17) He works at a/an _ _ _ _ _ _ _ _ .

18) He works at a/an _ _ _ _ _ _ _ _ _ _ .

19) She works at a/an _ _ _ _ _ _ .

20) He works on a/an _ _ _ _ .

ANSWER KEY

Section A	
1	D
2	B
3	B
4	A
5	D
6	D
7	B
8	D
9	A
10	B
11	A
12	C
13	C
14	B
15	C

Section B	
1	1.1. f 1.2. a 1.3. e 1.4. i 1.5. c 1.6. g
2	2.1. f 2.2. h 2.3. a 2.4. g 2.5. i 2.6. c
3	3.1. c 3.2. f 3.3. a 3.4. e 3.5. d 3.6. h
4	4.1. c 4.2. h 4.3. f 4.4. d 4.5. b 4.6. i
5	5.1. e 5.2. i 5.3. g 5.4. h 5.5. f 5.6. b

Section C	
1	dive
2	guitar
3	puzzles
4	fly
5	chess
6	kite
7	bike
8	marbles
9	shower
10	dinner
11	wash
12	teeth
13	in
14	behind
15	under
16	on
17	hospital
18	restaurant
19	school
20	farm

APPENDIX-B: Semi-Structured Interview Questions (Turkish Version)

*Bu sözlü görüşmede, İngilizce dersinde oynadığınız dijital oyunlaştırma uygulamaları (Diyalekt, Busuu, Duolingo, Jeopardy, Wordwall, LearningApps, Plickers) hakkında sorular sorulacaktır.

1) İngilizce dersinde oynadığınız dijital oyunların en çok hangi yönlerini beğendin? Neden?
2) Bu oyunlar hakkında neleri zorlayıcı buldun? Neden?
3) Oyunlaştırma unsurlarından;
   a) Puan kazanma,
   b) Lider tahtası,
   c) Rozet,
   d) Seviye atlama,
   e) Ödüller,
   f) Zamana karşı yarış
   g) Geri bildirimler (doğru ya da yanlış yaptığınızla ilgili ses, işaret ve yazılar)

   derse katılımını nasıl etkiledi? Örneğin, derslerde daha çok parmak kaldırmanı sağladı mı? Neden?
4) Bu oyunlar kelime öğrenme sürecindeki motivasyonunu nasıl etkiledi? Bu süreçte;
   a) oyunları oynarken eğlendin mi?
   b) oyunları ilgi çekici buldun mu?
   c) oyunlardaki performansından memnun kaldın mı?
   d) oyunlarda başarılı olmak senin için önemli miydi?
   e) oyunları oynarken gergin hissettin mi?
   f) oyunları isteyerek mi oynadın?
   g) oyunlar senin için faydalı mıydı?
   h) oyunları oynarken arkadaşlarınla iş birliği yaptın mı?
5) Bu oyunlarla kelime öğrenirken iyi odaklanabildin mi? Neden?
6) Bireysel oynadığınız oyunları mı daha çok sevdin yoksa grup halinde olanları mı? Neden?
7) Önceden öğrendiğin yönteme göre dijital oyunlarla kelimeleri daha kolay öğrenebildiğini düşünüyor musun? Neden?
8) Önceden öğrendiğin yönteme göre dijital oyunlarla öğrendiğin kelimelerin daha çok aklında kaldığını düşünüyor musun? Neden?

APPENDIX-C: Semi-Structured Interview Questions (English Version)

*In this semi-structured interview, you will be asked questions about the digital gamification applications (i.e., Diyalekt, Busuu, Duolingo, Jeopardy, Wordwall, LearningApps, and Plickers) you have played in English classes.

1) Which aspects of the digital games you played in English classes did you like the most? Why?
2) What did you find challenging about these games? Why?
3) How did gamification elements such as;
   a) Points,
   b) Leaderboard,
   c) Badges,
   d) Levels,
   e) Rewards,
   f) Countdown timer
   g) Feedback (sounds, signs, and texts about what you answered correctly and incorrectly) affect your participation in class? For example, did it encourage you to raise your finger more in class? Why?
4) How did these games affect your motivation in the vocabulary learning process? In this process,
   a) did you have fun playing the games?
   b) did you find the games interesting?
   c) were you satisfied with your performance at the games?
   d) was it important for you to do well at the games?
   e) did you feel nervous while playing the games?
   f) did you play the games because you wanted to?
   g) were the games useful for you?
   h) did you collaborate with your friends while playing the games?
5) Did you focus well while learning vocabulary with these games? Why?
6) Did you like the games you played individually more or the ones you played in groups? Why?
7) Do you think you can learn vocabulary more easily with digital games compared to the way you learned vocabulary before? Why?
8) Do you think you remember the vocabulary you learned through digital games better than the way you learned them before? Why?

APPENDIX-D: Pilot Study Informed Consent Form for Parents

Pilot Çalışma Veli Onam Formu
Dijital Oyunlaştırmanın İngilizceyi Yabancı Dil Olarak Öğrenen Çocukların Kelime Öğrenimine Etkisi

…/…/……

Sayın Veli,

Çalışmama gösterdiğiniz ilgi ve ayırdığınız vakit için şimdiden çok teşekkür ederim. Bu form, yapacağım araştırmanın amacı hakkında sizi bilgilendirmek ve velisi olduğunuz öğrencinin bir katılımcı olarak haklarını belirtmeyi amaçlamaktadır. Bu araştırma için Hacettepe Üniversitesi Etik Komisyonundan, Sosyal ve Beşeri Bilimler Araştırma Etik Kurulundan, T.C. Milli Eğitim Bakanlığı Konya İl Milli Eğitim Müdürlüğünden ve okul yönetiminden izin alınmıştır. Çalışmada gönüllü katılım esastır ve çocuğunuzun katılıp katılmamasını seçme hakkınız bulunmaktadır. Çalışma, dijital oyunlaştırmanın İngilizceyi yabancı dil olarak öğrenen çocukların kelime öğrenimine etkisini tespit etmek için Prof. Dr. Nuray ALAGÖZLÜ danışmanlığında hazırlanacak olan yüksek lisans tezi için araştırmacı tarafından geliştirilen, T. C. Milli Eğitim Bakanlığının İngilizce müfredatındaki ve ders kitabındaki hedef kelimelerden oluşan 40 soruluk bir Kelime Testinin ve öğrencilerin dijital oyunlaştırmaya ilişkin görüşlerini ölçme amacı taşıyan yarı yapılandırılmış görüşme formunun güvenirliğini ve geçerliğini ölçmeyi amaçlamaktadır.

Çocuğunuzun bulunduğu sınıfta kelimeler dijital oyunlarla öğretilecek, bunların fotoğrafları çekilecek, öğrencilerin yüzleri fotoğrafta görünmesi halinde kapatılacak, çocuğunuza uygulamadan önce, sonra ve hatırlamayı ölçmek için daha ileri bir tarihte araştırmacı tarafından geliştirilen kelime testi yapılacak ve uygulamanın sonunda çocuğunuzla yaklaşık 20 dakika sürmesi planlanan bir görüşme yapılıp oluşabilecek kesintileri önlemek için izin vermeniz halinde ses kaydı alınacaktır. Kimlik bilgileri, test sonuçları ve kayda alınacak olan tüm veriler sadece bilimsel amaçlarla kullanılacak olup bunun dışında hiçbir şekilde kullanılmayacak ve kimseyle paylaşılmayacaktır. Çocuğunuzun ya da sizin talep etmeniz halinde veriler size teslim edilebilecek ya da silinebilecektir. Gizliliğin korunması amacıyla çocuğunuz test ve görüşmede kendi adı yerine takma bir ad kullanacaktır. Çocuğunuz katıldıktan sonra istediği zaman kendisine hiçbir sorumluluk yüklenmeden ve akademik başarısı, okul ve öğretmenleriyle olan ilişkileri etkilenmeden katılımdan vazgeçebilir, görüşmeden ayrılabilir. Bu halde her türlü görüşme verisi ve kayıt silinecektir. Araştırma çocuğunuz için herhangi bir risk, rahatsızlık hissi, aksi tesirler taşımamaktadır. Bununla birlikte, hissedilen rahatsızlık durumu söz konusu olursa çocuğunuz çalışmadan ayrılabilecek, rahatsızlığın giderilmesi için gerekli yardım sağlanacaktır. Onay vermeden önce sormak istediğiniz herhangi bir konu varsa sormaktan çekinmeyiniz. Onay verdikten sonra da istediğiniz zaman onayınızdan vazgeçebilirsiniz. Çalışma bittikten sonra da bana her zaman telefon ya da e-posta ile ulaşarak araştırmayla ilgili soru sorabilir, sonuçları öğrenmek için iletişime geçebilirsiniz.

Bu açıklamaları okuduktan sonra, çocuğunuzun bu araştırmaya gönüllü olarak katılmasını ve size verdiğim güvenceye dayanarak bu formu imzalamanızı rica ediyorum. Çocuğunuzun araştırmaya katılması ve araştırma sonucu hakkında bilgi almak için bana dilediğiniz zaman ulaşabilirsiniz. Formu okuyarak imzaladığınız için çok teşekkür ederim.

Tarih: …/…/……

Katılımcı Öğrencinin Velisi
Adı, Soyadı:
Adres:
Telefon:
e-posta:
İmza:

Sorumlu Araştırmacı:
Prof. Dr. Nuray ALAGÖZLÜ
Adres:
Telefon:
e-posta:
İmza:

Araştırmacı:
Arş. Gör. Dilay ÜLKER
Adres:
Telefon:
e-posta:
İmza:

APPENDIX-E: Pilot Study Informed Consent Form for Teachers

Pilot Çalışma Öğretmen Onam Formu
Dijital Oyunlaştırmanın İngilizceyi Yabancı Dil Olarak Öğrenen Çocukların Kelime Öğrenimine Etkisi

…/…/……

Sayın Öğretmenim,

Çalışmama gösterdiğiniz ilgi ve ayırdığınız vakit için şimdiden çok teşekkür ederim. Çalışmada gönüllü katılım esastır ve katılımcıların katılıp katılmamayı seçme hakkı bulunmaktadır. Bu araştırma için Hacettepe Üniversitesi Etik Komisyonundan, Sosyal ve Beşeri Bilimler Araştırma Etik Kurulundan, T.C. Milli Eğitim Bakanlığı Konya İl Milli Eğitim Müdürlüğünden ve okul yönetiminden izin alınmıştır.

Dijital oyunlaştırmanın İngilizceyi yabancı dil olarak öğrenen çocukların kelime öğrenimine etkisini tespit etmek amacıyla araştırmacı tarafından geliştirilen test ve yarı yapılandırılmış görüşme formunun güvenirlik ve geçerliğini tespit etmek için Prof. Dr. Nuray ALAGÖZLÜ danışmanlığında hazırlanacak olan ve yüksek lisans tez çalışmamın bir parçası olan bu pilot çalışmada öğrencilere araştırmacı tarafından geliştirilen T. C. Milli Eğitim Bakanlığının İngilizce müfredatındaki ve ders kitabındaki hedef kelimelerden oluşan 40 soruluk bir Kelime Testini uygulamak, öğrencilerle yaklaşık 20 dakika sürmesi planlanan bir görüşme yapıp izin dahilinde ses kayında almak ve gerektiğinde sizin sınıf içinde yapacağınız uygulamaların fotoğraflarını çekmek istiyorum. Fotoğraflarda sizin ve öğrencilerin yüzü görünmesi halinde yüzleriniz kapatılacaktır. Bu süreçte kelimeler dijital oyunlarla öğretilecek olup sizin uygulamalarınız bu araştırma için son derece önem taşımaktadır. Kimlik bilgileri, test sonuçları, fotoğraflar ve kayda alınacak olan tüm veriler sadece bilimsel amaçlarla kullanılacak olup bunun dışında hiçbir şekilde kullanılmayacak ve paylaşılmayacaktır. Gizliliğinizin korunması adına çalışmada adınızın kullanılması gerekirse takma bir ad kullanılacaktır. Katıldıktan sonra istediğiniz an katılımdan vazgeçebileceğinizi ve bunun size bir sorumluluk getirmeyeceğini ve öğrencilerin akademik başarıları, okul ve öğretmenleriyle olan ilişkilerinin etkilenmeyeceğini taahhüt ederim. Araştırma herhangi bir risk, rahatsızlık hissi, aksi tesirler taşımamaktadır. Bununla birlikte, rahatsız hissetmeniz durumunda çalışmadan ayrılabileceğinizi ve rahatsızlığın giderilmesi için gereken yardımın sağlanacağını taahhüt ederim. Onay vermeden önce sormak istediğiniz herhangi bir konu varsa sormaktan çekinmeyiniz. Çalışma bittikten sonra da bana her zaman telefon ya da e-posta ile ulaşarak araştırmayla ilgili soru sorabilir, sonuçları öğrenmek için iletişime geçebilirsiniz. Kayda alınan veriler dilediğiniz takdirde sizinle paylaşılabilecek ve silinebilecektir.

Bu bilgileri okuduktan sonra, bu çalışmaya gönüllü olarak katıldığınıza ve haklarınızı araştırmacı olarak koruyacağıma dair bir belge olarak bu formu imzalamanızı rica ederim.

Tarih: …/…/……

Katılımcı Öğretmen
Adı, Soyadı:
Adres:
Telefon:
e-posta:
İmza:

Sorumlu Araştırmacı:
Prof. Dr. Nuray ALAGÖZLÜ
Adres:
Telefon:
e-posta:
İmza:

Araştırmacı:
Arş. Gör. Dilay ÜLKER
Adres:
Telefon:
e-posta:
İmza:

APPENDIX-F: Pilot Study Informed Consent Form for Minors

Pilot Çalışma Çocuk Gönüllü Katılım Formu
Dijital Oyunlaştırmanın İngilizceyi Yabancı Dil Olarak Öğrenen Çocukların Kelime Öğrenimine Etkisi

…/…/……

Merhaba,

Çalışmama ilgi gösterdiğin ve vakit ayırdığın için şimdiden çok teşekkür ederim. Bu formla, yapacağım araştırma hakkında seni bilgilendirmeyi, haklarını ve neler yapacağımızı anlatmayı amaçladım.

Bu araştırma için Hacettepe Üniversitesi Etik Komisyonundan, Sosyal ve Beşeri Bilimler Araştırma Etik Kurulundan, T.C. Milli Eğitim Bakanlığı Konya İl Milli Eğitim Müdürlüğünden ve okul yönetiminden izin alınmıştır. Araştırma, dijital oyunların çocukların İngilizce kelime öğrenimine etkisini tespit etmek için, Prof. Dr. Nuray ALAGÖZLÜ danışmanlığında hazırlanacak olan bir yüksek lisans tezidir. Bunun için araştırmacının geliştirdiği, T. C. Milli Eğitim Bakanlığının İngilizce müfredatındaki ve ders kitabındaki hedef kelimelerden oluşan 40 soruluk bir Kelime Testinin ve görüşme sorularının ne kadar güvenilir ve geçerli olduğunu belirlemek için bir çalışma yapılacaktır.

Araştırmaya gönüllü olarak katılım esastır ve katılıp katılmamayı seçme hakkın bulunmaktadır. Gerekirse tezime ekleyebilmem için katıldığın derslerde sınıftaki uygulamaların fotoğrafları çekilecek ve yüzünün görünmesi durumunda gizliliğini korumak için fotoğraflarda yüzün kapatılacaktır. Uygulamadan önce, sonra ve hatırlamayı ölçmek için bir süre sonra araştırmacının geliştirdiği kelime testi uygulanacaktır. Uygulamanın sonunda izin vermen halinde seninle yaklaşık 20 dakikalık bir görüşme gerçekleştirmek ve görüşme sırasında izin vermen halinde ses kaydı almak istiyorum. Kimlik bilgileri, test sonuçları, kayda alınacak olan bu fotoğraflar ve görüşme verileri sadece bilimsel amaçlarla kullanılacak, bunun dışında hiçbir amaçla kullanılmayacak ve kimseyle paylaşılmayacaktır. Dilediğin takdirde kayıtlar silinebilecek ya da seninle paylaşılabilecektir. Güvenliğini korumak için adının araştırmada kullanılmasının gerektiği durumda kendi adın yerine takma bir ad kullanılacaktır. Bu araştırma herhangi bir risk, rahatsızlık hissi, olumsuz etki taşımamaktadır. Yine de, rahatsız hissedersen çalışmadan çekilebilirsin. Bu durumda, rahatsızlığını gidermek için sana gereken yardım sağlanacaktır. Katıldıktan sonra istediğin zaman uygulamadan ayrılabilir, testi bırakabilir, görüşmeyi kesebilir ya da çalışmadan tamamen çıkabilirsin. Bu durumda sana hiçbir sorumluluk yüklenmeyecek ve okul başarın ile okul ve öğretmenlerinle olan ilişkilerin etkilenmeyecektir. Ayrıca, bu durumda test sonuçları, yapılan kayıtlar ve görüşme verileri kullanılmayacaktır.

Bu açıklamaları okuyup bu araştırmaya gönüllü olarak katılmanı ve sana verdiğim güvenceye dayanarak bu formu imzalamanı rica ederim. Onay vermeden önce bana sormak istediğin herhangi bir konu varsa sormaktan çekinme. Çalışma bittikten sonra da bana telefon ya da e-posta ile ulaşarak soru sorabilirsin. Sormak istediğin her konuyu ve sonuçları öğrenmek için benimle her zaman iletişime geçebilirsin. Formu okuyarak imzaladığın için çok teşekkür ederim.

Tarih: …/…/……

Katılımcı Öğrenci
Adı, Soyadı:
Adres:
Telefon:
İmza:

Sorumlu Araştırmacı:
Prof. Dr. Nuray ALAGÖZLÜ
Adres:
Telefon:
e-posta:
İmza:

Araştırmacı:
Arş. Gör. Dilay ÜLKER
Adres:
Telefon:
e-posta:
İmza:

APPENDIX-G: Informed Consent Form for Parents

Veli Onam Formu
Dijital Oyunlaştırmanın İngilizceyi Yabancı Dil Olarak Öğrenen Çocukların Kelime Öğrenimine Etkisi

…/…/……

Sayın Veli,

Çalışmama gösterdiğiniz ilgi ve ayırdığınız vakit için şimdiden çok teşekkür ederim. Bu form, yapacağım araştırmanın amacı hakkında sizi bilgilendirmek ve velisi olduğunuz öğrencinin bir katılımcı olarak haklarını belirtmeyi amaçlamaktadır. Bu araştırma için Hacettepe Üniversitesi Etik Komisyonundan, Sosyal ve Beşeri Bilimler Araştırma Etik Kurulundan, T.C. Milli Eğitim Bakanlığı Konya İl Milli Eğitim Müdürlüğünden ve okul yönetiminden izin alınmıştır. Çalışmada gönüllü katılım esastır ve çocuğunuzun katılıp katılmamasını seçme hakkınız bulunmaktadır. Araştırma, dijital oyunlaştırmanın İngilizceyi yabancı dil olarak öğrenen çocukların kelime öğrenimine etkisini tespit etmek için Prof. Dr. Nuray ALAGÖZLÜ danışmanlığında hazırlanacak olan bir yüksek lisans tezidir. Bu sebeple, öğrencilerin dijital oyunlaştırma uygulamalarından önce ve sonra kelime bilgilerinin ölçülmesi ve görüşlerinin alınması son derece önemlidir.

Çocuğunuzun bulunduğu sınıfta dijital oyunlarla kelime öğretimi yapılacak, bu uygulamaların fotoğrafları çekilecek, öğrencilerin yüzleri fotoğrafta görünmesi halinde kapatılacak, çocuğunuza uygulamadan önce, sonra ve hatırlamayı ölçmek için daha ileri bir tarihte araştırmacı tarafından geliştirilen ve T. C. Milli Eğitim Bakanlığının İngilizce müfredatındaki ve ders kitabındaki hedef kelimelerden oluşan 40 soruluk bir Kelime Testi yapılacak ve uygulamanın sonunda çocuğunuzla yaklaşık 20 dakika sürmesi planlanan yarı yapılandırılmış bir görüşme yapılıp oluşabilecek kesintileri önlemek için izin vermeniz halinde ses kaydı alınacaktır. Kimlik bilgileri, test sonuçları, fotoğraflar ve kayda alınacak olan tüm veriler sadece bilimsel amaçlarla kullanılacak olup bunun dışında hiçbir şekilde kullanılmayacak ve kimseyle paylaşılmayacaktır. Çocuğunuzun ya da sizin talep etmeniz halinde veriler size teslim edilebilecek ya da silinebilecektir. Gizliliğin korunması amacıyla çocuğunuz kendi adı yerine takma bir ad kullanacaktır. Çocuğunuz katıldıktan sonra istediği zaman kendisine hiçbir sorumluluk yüklenmeden ve akademik başarısı, okul ve öğretmenleriyle olan ilişkileri etkilenmeden uygulama, test, görüşme ya da tamamen çalışmadan ayrılabilir. Bu halde her türlü görüşme verisi ve kayıt silinecektir. Araştırma çocuğunuz için herhangi bir risk, rahatsızlık hissi, aksi tesirler taşımamaktadır. Bununla birlikte, hissedilen rahatsızlık durumu söz konusu olursa çocuğunuz çalışmadan ayrılabilecek, rahatsızlığın giderilmesi için gerekli yardım sağlanacaktır. Onay vermeden önce sormak istediğiniz herhangi bir konu varsa sormaktan çekinmeyiniz. Çalışma bittikten sonra da bana her zaman telefon ya da e-posta ile ulaşarak araştırmayla ilgili soru sorabilir, sonuçları öğrenmek için iletişime geçebilirsiniz.

Bu açıklamaları okuduktan sonra, çocuğunuzun bu araştırmaya gönüllü olarak katılmasını ve size verdiğim güvenceye dayanarak bu formu imzalamanızı rica ediyorum. Çocuğunuzun araştırmaya katılması ve araştırma sonucu hakkında bilgi almak için bana dilediğiniz zaman ulaşabilirsiniz. Formu okuyarak imzaladığınız için çok teşekkür ederim.

Tarih: …/…/……

Katılımcı Öğrencinin Velisi
Adı, Soyadı:
Adres:
Telefon:
e-posta:
İmza:

Sorumlu Araştırmacı:
Prof. Dr. Nuray ALAGÖZLÜ
Adres:
Telefon:
e-posta:
İmza:

Araştırmacı:
Arş. Gör. Dilay ÜLKER
Adres:
Telefon:
e-posta:
İmza:

APPENDIX-H: Informed Consent Form for Teachers

Öğretmen Onam Formu

Dijital Oyunlaştırmanın İngilizceyi Yabancı Dil Olarak Öğrenen Çocukların Kelime Öğrenimine Etkisi

…/…/……

Sayın Öğretmenim,

Çalışmama gösterdiğiniz ilgi ve ayırdığınız vakit için şimdiden çok teşekkür ederim. Çalışmada gönüllü katılım esastır ve katılımcıların katılıp katılmamayı seçme hakkı bulunmaktadır. Bu araştırma için Hacettepe Üniversitesi Etik Komisyonundan, Sosyal ve Beşeri Bilimler Araştırma Etik Kurulundan, T.C. Milli Eğitim Bakanlığı Konya İl Milli Eğitim Müdürlüğünden ve okul yönetiminden izin alınmıştır.

Dijital oyunlaştırmanın İngilizceyi yabancı dil olarak öğrenen çocukların kelime öğrenimine etkisini tespit etmek için Prof. Dr. Nuray ALAGÖZLÜ danışmanlığında hazırlanacak olan yüksek lisans tez çalışmamda öğrencilere araştırmacı tarafından geliştirilen ve T. C. Milli Eğitim Bakanlığının İngilizce müfredatındaki ve ders kitabındaki hedef kelimelerden oluşan 40 soruluk bir Kelime Testi uygulamak, öğrencilerle yaklaşık 20 dakika sürmesi planlanan bir görüşme yapıp izin dahilinde ses kayında almak ve gerektiğinde sizin sınıf içinde yapacağınız uygulamaların fotoğraflarını çekmek istiyorum. Fotoğraflarda öğrencilerin ve sizin yüzünüz görünmesi halinde yüzleriniz kapatılacaktır. Bu süreçte kelimeler dijital oyunlarla öğretilecek olup sizin uygulamalarınız bu araştırma için son derece önem taşımaktadır. Kimlik bilgileri, test sonuçları, fotoğraflar ve kayda alınacak olan tüm veriler sadece bilimsel amaçlarla kullanılacak olup bunun dışında hiçbir şekilde kullanılmayacak ve paylaşılmayacaktır. Gizliliğinizin korunması adına çalışmada adınızın kullanılması gerekirse takma bir ad kullanılacaktır. Katıldıktan sonra istediğiniz an çalışmadan ayrılabileceğinizi ve bunun size bir sorumluluk getirmeyeceğini ve öğrencilerin akademik başarıları, okul ve öğretmenleriyle olan ilişkilerinin etkilenmeyeceğini taahhüt ederim. Araştırma herhangi bir risk, rahatsızlık hissi, aksi tesirler taşımamaktadır. Bununla birlikte, rahatsız hissetmeniz durumunda çalışmadan ayrılabileceğinizi ve rahatsızlığın giderilmesi için gereken yardımın sağlanacağını taahhüt ederim. Onay vermeden önce sormak istediğiniz herhangi bir konu varsa sormaktan çekinmeyiniz. Çalışma bittikten sonra da bana her zaman telefon ya da e-posta ile ulaşarak araştırmayla ilgili soru sorabilir, sonuçları öğrenmek için iletişime geçebilirsiniz. Kayda alınan veriler dilediğiniz takdirde sizinle paylaşılabilecektir.

Bu bilgileri okuduktan sonra, bu çalışmaya gönüllü olarak katıldığınıza ve haklarınızı araştırmacı olarak koruyacağıma dair bir belge olarak bu formu imzalamanızı rica ederim.

Tarih: …/…/……

Katılımcı Öğretmen
Adı, soyadı:
Adres:
Telefon:
e-posta:
İmza:

Sorumlu Araştırmacı:
Prof. Dr. Nuray ALAGÖZLÜ
Adres:
Telefon:
e-posta:
İmza:

Araştırmacı:
Arş. Gör. Dilay ÜLKER
Adres:
Telefon:
e-posta:
İmza:

APPENDIX-I: Informed Consent Form for Minors

Çocuk Gönüllü Katılım Formu
Dijital Oyunlaştırmanın İngilizceyi Yabancı Dil Olarak Öğrenen Çocukların Kelime Öğrenimine Etkisi

…/…/……

Merhaba,

Çalışmama gösterdiğin ilgi ve ayırdığın vakit için şimdiden çok teşekkür ederim. Bu formla, yapacağım araştırma hakkında seni bilgilendirmeyi, haklarını ve neler yapacağımızı anlatmayı amaçladım.

Bu araştırma için Hacettepe Üniversitesi Etik Komisyonundan, Sosyal ve Beşeri Bilimler Araştırma Etik Kurulundan, T.C. Milli Eğitim Bakanlığı Konya İl Milli Eğitim Müdürlüğünden ve okul yönetiminden izin alınmıştır. Araştırma, dijital oyunların çocukların İngilizce kelime öğrenimine etkisini tespit etmek için, Prof. Dr. Nuray ALAGÖZLÜ danışmanlığında hazırlanacak olan bir yüksek lisans tezidir. Bu süreçte, kelimeler dijital oyunlarla öğretilecektir. Bu sebeple, sınıfta yapılacak olan uygulamalara katılman ve bunlarla ilgili görüşlerin çok önemli.

Araştırmaya gönüllü olarak katılım esastır ve katılıp katılmamayı seçme hakkın bulunmaktadır. Gerekirse tezime ekleyebilmem için katıldığın derslerde sınıftaki uygulamaların fotoğrafları çekilecek ve yüzünün görünmesi durumunda gizliliğini korumak için fotoğraflarda yüzün kapatılacaktır. Uygulamadan önce, sonra ve hatırlamayı ölçmek için bir süre sonra araştırmacının geliştirdiği ve T. C. Milli Eğitim Bakanlığının İngilizce müfredatındaki ve ders kitabındaki hedef kelimelerden oluşan 40 soruluk bir Kelime Testi uygulanacaktır. Uygulamanın sonunda izin vermen halinde seninle yaklaşık 20 dakikalık bir görüşme gerçekleştirmek ve görüşme sırasında izin vermen halinde ses kaydı almak istiyorum. Kimlik bilgileri, test sonuçları, kayda alınacak olan bu fotoğraflar ve görüşme verileri sadece bilimsel amaçlarla kullanılacak, bunun dışında hiçbir amaçla kullanılmayacak ve paylaşılmayacaktır. Dilediğin takdirde kayıtlar silinebilecek ya da seninle paylaşılabilecektir. Güvenliğini korumak için adının araştırmada kullanılmasının gerektiği durumda kendi adın yerine takma bir ad kullanılacaktır. Bu araştırma herhangi bir risk, rahatsızlık hissi, olumsuz etki taşımamaktadır. Yine de, rahatsız hissedersen çalışmadan çekilebilirsin. Bu durumda, rahatsızlığını gidermek için sana gereken yardım sağlanacaktır. Katıldıktan sonra istediğin zaman uygulamadan ayrılabilir, testi bırakabilir, görüşmeyi kesebilir ya da çalışmadan tamamen çıkabilirsin. Bu durumda sana hiçbir sorumluluk yüklenmeyecek ve akademik başarın ile okul ve öğretmenlerinle olan ilişkilerin etkilenmeyecektir. Ayrıca, bu durumda test sonuçları, yapılan kayıtlar ve görüşme verileri kullanılmayacaktır.

Bu açıklamaları okuyup bu araştırmaya gönüllü olarak katılmanı ve sana verdiğim güvenceye dayanarak bu formu imzalamanı rica ederim. Onay vermeden önce bana sormak istediğin herhangi bir konu varsa sormaktan çekinme. Çalışma bittikten sonra da bana telefon ya da e-posta ile ulaşarak soru sorabilirsin. Sormak istediğin her konuyu ve sonuçları öğrenmek için benimle her zaman iletişime geçebilirsin. Formu okuyarak imzaladığın için çok teşekkür ederim.

Tarih: …/…/……

Katılımcı Öğrenci
Adı, soyadı:
Adres:
Telefon:
İmza:

Sorumlu Araştırmacı:
Prof. Dr. Nuray ALAGÖZLÜ
Adres:
Telefon:
İmza:

Araştırmacı:
Arş. Gör. Dilay ÜLKER
Adres:
Telefon:
İmza:

APPENDIX-J: Ethics Committee Approval

Tarih: 25/10/2023 15:08
Sayı: E-66777842-300-00003163478
00003163478

T.C.
HACETTEPE ÜNİVERSİTESİ REKTÖRLÜĞÜ
Sosyal ve Beşeri Bilimler Araştırma Etik Kurulu

Sayı : E-66777842-300-00003163478 25/10/2023
Konu : Etik Kurul İzni (Dilay ÜLKER)

EĞİTİM BİLİMLERİ ENSTİTÜSÜ MÜDÜRLÜĞÜNE

İlgi : 17.10.2023 tarihli ve E-51944218-300-00003144628 sayılı yazınız.

Enstitünüz Yabancı Diller Eğitimi Ana Bilim Dalı İngiliz Dili Eğitimi yüksek lisans programı öğrencisi **Dilay ÜLKER, Prof. Dr. Nuray ALAGÖZLÜ'nün** sorumluluğunda yürüttüğü **"Dijital Oyunlaştırmanın İncilizceyi Yabancı Dil Olarak Öğrenen Çocukların Kelime Öğrenimine Etkisi"** başlıklı tez çalışması Üniversitemiz Sosyal ve Beşeri Bilimler Araştırma Etik Kurulunun **24 Ekim 2023** tarihinde yapmış olduğu toplantıda incelenmiş olup, etik açıdan uygun bulunmuştur.

Bilgilerinizi ve gereğini rica ederim.

Prof. Dr. İsmet KOÇ
Kurul Başkanı

Bu belge güvenli elektronik imza ile imzalanmıştır.

Belge Doğrulama Kodu: D945DAA4-6495-4889-9E86-3D42B1A9D842 Belge Doğrulama Adresi: https://www.turkiye.gov.tr/hu-ebys

Adres:
E-posta: Elektronik Ağ: www.hacettepe.edu.tr
Telefon: Faks:
Kep:

Bilgi için: Meryem KÖSE
Bilgisayar İşletmeni
Telefon: 03122977367

APPENDIX-K: Provincial Directorate of National Education Approval

T.C.
KONYA VALİLİĞİ
İl Millî Eğitim Müdürlüğü

Sayı : E-83688308-605.99-85231811 26.09.2023
Konu : Araştırma İzni (Dilay ÜLKER)

DAĞITIM YERLERİNE

İlgi : a) Millî Eğitim Bakanlığının (Yenilik ve Eğitim Teknolojileri Genel Müdürlüğü) 21.01.2020 tarihli ve 2020/2 sayılı Genelgesi.
b) 26/09/2023 tarihli ve 85129811 sayılı dilekçeniz.
c) 26/09/2023 tarihli Araştırma İzinleri Değerlendirme Komisyonu Tutanağı.

Hacettepe Üniversitesi Eğitim Bilimleri Enstitüsü Yabancı Diller Eğitimi Ana Bilim Dalı İngiliz Dili Eğitimi Bilim Dalı Yüksek Lisans Programı öğrencisi Dilay ÜLKER'in "Dijital Oyunlaştırmanın İngilizceyi Yabancı Dil Olarak Öğrenen Çocukların Kelime Öğrenimine Etkisi" konulu araştırmasını uygulama talebi incelenmiştir.

Araştırmanın, Selçuklu ilçesinde bulunan Dikilitaş Sahip Ata İlkokulu Müdürlüğü ile Şerife Akkanat İlkokulu Müdürlüğünde eğitim gören öğrencilere eğitim öğretimi aksatmamak ve ilgi (a) Genelgede belirtilen açıklamalara uyulması kaydıyla gerçekleştirilmesi ilgi (c) komisyon tutanağıyla uygun görülmektedir. Müdürlüğümüze bağlı eğitim kurumlarındaki çalışmaların 2023-2024 eğitim öğretim yılı içerisinde tamamlanması zorunludur. Araştırma kapsamında yürütülecek çalışmaların 2023-2024 eğitim öğretim yılında tamamlanmaması durumunda Müdürlüğümüzden tekrar izin alınması gerekmektedir.

Araştırmada Müdürlüğümüz tarafından onaylanarak gönderilen veri toplama araçlarının kullanılması, elde edilecek kişisel verilerin gizliliği hususuna dikkat edilmesi ve araştırma sonucunun çalışma bitiminden itibaren 30 gün içerisinde elektronik ortamda istatistik42@meb.gov.tr e-posta adresine gönderilmesi gerekmektedir.

Rica ederim.

Aynur TÜRKOĞLU
Müdür a.
Müdür Yardımcısı

Ek:
1-Genelge (3 Sayfa)
2-Gönüllü Katılım Formları (3 Sayfa)
3-Yarı Yapılandırılmış Sözlü Görüşme Soruları (1 Sayfa)
4-Vocabulary Test (9 Sayfa)

Dağıtım:
Gereği: Bilgi:
Sayın Dilay ÜLKER Selçuklu İlçe Millî Eğitim Müdürlüğüne

APPENDIX-L: Declaration of Ethical Conduct

I hereby declare that…

- I have prepared this thesis in accordance with the thesis writing guidelines of the Graduate School of Educational Sciences of Hacettepe University;
- all information and documents in the thesis/dissertation have been obtained in accordance with academic regulations;
- all audio visual and written information and results have been presented in compliance with scientific and ethical standards;
- in case of using other people's work, related studies have been cited in accordance with scientific and ethical standards;
- all cited studies have been fully and decently referenced and included in the list of References;
- I did not do any distortion and/or manipulation on the data set,
- and **NO** part of this work was presented as a part of any other thesis study at this or any other university.

22/11/2024

Dilay ÜLKER

APPENDIX-M: Thesis/Dissertation Originality Report

01/11/2024

HACETTEPE UNIVERSITY

Graduate School of Educational Sciences

To The Department of Foreign Language Education

Thesis Title: THE EFFECT OF DIGITAL GAMIFICATION ON YOUNG EFL LEARNERS' VOCABULARY LEARNING

The whole thesis that includes the *title page, introduction, main chapters, conclusions and bibliography section* is checked by using **Turnitin** plagiarism detection software take into the consideration requested filtering options. According to the originality report obtained data are as below.

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I declare that I have carefully read Hacettepe University Graduate School of Educational Sciences Guidelines for Obtaining and Using Thesis Originality Reports; that according to the maximum similarity index values specified in the Guidelines, my thesis does not include any form of plagiarism; that in any future detection of possible infringement of the regulations I accept all legal responsibility; and that all the information I have provided is correct to the best of my knowledge.

I respectfully submit this for approval.

Name Lastname: Dilay ÜLKER

Student No.: N22132401 Signature

Department: Foreign Language Education

Program: English Language Teaching

Status: ☒ Masters ☐ Ph.D. ☐ Integrated Ph.D.

ADVISOR APPROVAL

APPROVED
Prof. Dr. Nuray ALAGÖZLÜ

Signature

APPENDIX-N: Yayımlama ve Fikrî Mülkiyet Hakları Beyanı

Enstitü tarafından onaylanan lisansüstü tezimin/raporumun tamamını veya herhangi bir kısmını, basılı (kâğıt) ve elektronik formatta arşivleme ve aşağıda verilen koşullarla kullanıma açma iznini Hacettepe Üniversitesine verdiğimi bildiririm. Bu izinle Üniversiteye verilen kullanım hakları dışındaki tüm fikri mülkiyet haklarım bende kalacak, tezimin tamamının ya da bir bölümünün gelecekteki çalışmalarda (makale, kitap, lisans ve patent vb.) kullanım hakları bana ait olacaktır.

Tezin kendi orijinal çalışmam olduğunu, başkalarının haklarını ihlal etmediğimi ve tezimin tek yetkili sahibi olduğumu beyan ve taahhüt ederim. Tezimde yer alan telif hakkı bulunan ve sahiplerinden yazılı izin alınarak kullanılması zorunlu metinlerin yazılı izin alınarak kullandığımı ve istenildiğinde suretlerini Üniversiteye teslim etmeyi taahhüt ederim.

Yükseköğretim Kurulu tarafından yayınlanan "**Lisansüstü Tezlerin Elektronik Ortamda Toplanması, Düzenlenmesi ve Erişime Açılmasına ilişkin Yönerge**" kapsamında tezim aşağıda belirtilen koşullar haricince YÖK Ulusal Tez Merkezi / H.Ü. Kütüphaneleri Açık Erişim Sisteminde erişime açılır.

- Enstitü / Fakülte yönetim kurulu kararı ile tezimin erişime açılması mezuniyet tarihinden itibaren 2 yıl ertelenmiştir. (1)
- Enstitü / Fakülte yönetim kurulunun gerekçeli kararı ile tezimin erişime açılması mezuniyet tarihimden itibaren … ay ertelenmiştir. (2)
- Tezimle ilgili gizlilik kararı verilmiştir. (3)

22 /11 /2024

Dilay ÜLKER

"Lisansüstü Tezlerin Elektronik Ortamda Toplanması, Düzenlenmesi ve Erişime Açılmasına İlişkin Yönerge"

(1) Madde 6. 1. Lisansüstü tezle ilgili patent başvurusu yapılması veya patent alma sürecinin devam etmesi durumunda, tez danışmanının önerisi ve enstitü anabilim dalının uygun görüşü Üzerine enstitü veya fakülte yönetim kurulu iki yıl süre ile tezin erişime açılmasının ertelenmesine karar verebilir.

(2) Madde 6.2. Yeni teknik, materyal ve metotların kullanıldığı, henüz makaleye dönüşmemiş veya patent gibi yöntemlerle korunmamış ve internetten paylaşılması durumunda 3. şahıslara veya kurumlara haksız kazanç; imkânı oluşturabilecek bilgi ve bulguları içeren tezler hakkında tez danışmanın önerisi ve enstitü anabilim dalının uygun görüşü üzerine enstitü veya fakülte yönetim kurulunun gerekçeli kararı ile altı ayı aşmamak üzere tezin erişime açılması engellenebilir.

(3) Madde 7. 1. Ulusal çıkarları veya güvenliği ilgilendiren, emniyet, istihbarat, savunma ve güvenlik, sağlık vb. konulara ilişkin lisansüstü tezlerle ilgili gizlilik kararı, tezin yapıldığı kurum tarafından verilir. Kurum ve kuruluşlarla yapılan işbirliği protokolü çerçevesinde hazırlanan lisansüstü tezlere ilişkin gizlilik kararı ise, ilgili kurum ve kuruluşun önerisi ile enstitü veya fakültenin uygun görüşü Üzerine üniversite yönetim kurulu tarafından verilir. Gizlilik kararı verilen tezler Yükseköğretim Kuruluna bildirilir.*

Madde 7.2. Gizlilik kararı verilen tezler gizlilik süresince enstitü veya fakülte tarafından gizlilik kuralları çerçevesinde muhafaza edilir, gizlilik kararının kaldırılması halinde Tez Otomasyon Sistemine yüklenir

**Tez danışmanının önerisi ve enstitü anabilim dalının uygun görüşü üzerine enstitü veya fakülte yönetim kurulu tarafından karar verilir.*