



GRADUATE SCHOOL
ISTANBUL MEDENIYET UNIVERSITY
DEPARTMENT OF FOREIGN LANGUAGE EDUCATION

**The Efficacy of AI-Enhanced Gamification for
Vocabulary Learning in the EFL Learning Context**

Master's Thesis

Serdar Hoşer

June 2024



GRADUATE SCHOOL
ISTANBUL MEDENIYET UNIVERSITY
DEPARTMENT OF FOREIGN LANGUAGE EDUCATION

**The Efficacy of AI-Enhanced Gamification for
Vocabulary Learning in the EFL Learning Context**

Master's Thesis

Serdar Hoşer

Supervisor

Prof. Dr. Selami Aydın

June 2024

THESIS JURY APPROVAL

This MA thesis titled “ The Efficacy of AI-Enhanced Gamification for Vocabulary Learning in the EFL Learning Context” written by Serdar Hoşer at the Department of Foreign Language Teaching was accepted by our jury.

JURY MEMBERS

SIGNATURE

Supervisor:

Prof. Dr. Selami Aydın
İstanbul Medeniyet University

Other Jury Members:

Asst. Prof. Ferdane Denkci Akkaş
İstanbul Medeniyet University

Assoc. Prof. Burcu Ünal
Yıldız Technical University

Date of Defense: 26 / 06 / 2024

STATEMENTS

Style and Reference Manual Statement

Having reviewed this thesis written under my supervision, I confirm that it has been written in accordance with the APA (7th Edition) Manual of Style and used its [footnote/in text] reference format consistently throughout the entire text.

Signature

Prof.Dr.Selami Aydın

Declaration of Originality

I hereby declare that all information in this dissertation has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conducts, I have fully cited and referenced all material and results that are not original to this work.

Signature

Serdar Hoşer

GENİŞ ÖZET

İngilizce'nin Yabancı Dil Olarak Öğrenilmesi Bağlamında Yapay Zekâ Destekli Oyunlaştırmanın Kelime Öğrenimine Etkisi

Hoşer, Serdar

Yüksek Lisans Tezi, Yabancı Diller Eğitimi Anabilim Dalı

Danışman: Prof. Dr. Selami Aydın

Haziran 2024

Yabancı dil öğretiminde kelime öğrenme çeşitli nedenlerden dolayı önemli bir yere sahiptir. İletişimde kelimeler, anlamlı mesajlar iletme işlevine sahiptir. Dilbilgisi olmadan çok az şey aktarılabilir; fakat kelime dağarcığı olmadan hiçbir şey aktarılamaz (Wilkins, 1972). Kelime öğreniminin, yabancı dil olarak İngilizce öğrenimi bağlamında okuma becerilerinin gelişimine de önemli bir katkısı bulunmaktadır (Brooks ve diğerleri, 2021). Kelime öğrenimi ayrıca dinleme becerisinin geliştirilmesinde ve dinlenenlerin anlamlandırılmasında önemli bir rol oynar (Mecartty, 2000). Son olarak, kelime dağarcığı İngilizce öğrenenlerin konuşma ve yazma becerilerinin gelişiminde önemli bir yapı taşı görevi üstlenir (Kılıç, 2019). Bu bakış açısına göre oyunlaştırma, İngilizce öğrenenler için kelime öğrenmede önemli bir yere sahip olabilir.

Oyunlaştırma, çeşitli nedenlerden dolayı kelime öğrenmede önemli bir yere sahiptir. İlk olarak, oyunlaştırma öğrenenlerin dikkatini çeker ve aktif katılımını sağlar (Ahmed ve diğerleri, 2022). Oyunlaştırma ayrıca kelime öğrenmeye yönelik olumlu bakış açısı ve tutum kazandırmada etkiye sahiptir (Thurairasu, 2022). İkincisi, oyunlaştırma öğrenilen kelimelerin esnek zamanlarda tekrarını ve gözden geçirilmesini sağlar (Waluyo ve Bucol, 2021). Böylece oyunlaştırma, kelimelerin daha uzun süre akılda tutulmasına ve kalıcı öğrenmeye katkı sunarak kelimelerin düzenli tekrarını ve gözden geçirilmesini sağlar (Quynh, 2022). Daha sonra, öğrenciler geleneksel ve tekdüze kelime öğrenimini eğlenceli ve ilginç kılmak için oyunlaştırma stratejisini kullanabilirler (Waer, 2021).

Kelime öğrenimini geliştirmede yapay zekâ destekli oyunlaştırma çeşitli nedenlerden ötürü büyük önem taşıyabilir. Yapay zekâ destekli oyunlaştırma, kişisel gelişimi temel alarak aktif ve katılımcı öğrenme fırsatlarını teşvik ederek kelime öğrenme sürecini daha zevkli ve üretken hale getirebilir (Sumakul ve diğerleri, 2022). Yapay zekâ algoritmaları

sayesinde öğrencilerin gizil yetenekleri ve potansiyelleri ortaya çıkarılarak, öğrenenlere kelime dağarcığını geliştirmede özel zorluklar ve fırsat imkanları sunulabilir (Zhai ve Wibowo, 2023). Tüm bunlara ek olarak, yapay zekâ uygulaması öğrencilerin motivasyon ve güdülenme düzeylerini artırarak günlük olarak daha fazla kelime öğrenmeye teşvik edebilir (Li, 2021). Yapay zekânın bireysel öğrenimi desteklemesi, öğrencilerin kelime öğrenmesine de fırsat sağlayabilir (Tapalova ve Zhiyenbayeva, 2022).

Kelime dağarcığı, İngilizce öğrenenler için en büyük zorluklardan biri olarak tanımlanmıştır (Meara, 1980). Yabancı dilin kelimeleri öğrenilirken, hangi kurallara uyulacağı veya önce hangi kelimelere hakim olunacağı belirsizdir (Alqahtani, 2015). Öğrenciler, yeni kelimelerin, terimlerin, çok anlamlı kelimelerin, sesteş ve türemiş kelimelerin, veya kültüre özgü anlamlar içeren kelimelerin anlamlarını tahmin etmede zorluk çekmektedirler (Altyari, 2017). Oxford (1990), binlerce farklı tanımı ve kullanımı nedeniyle, ister ana dil ister yabancı dil bağlamında olsun, kelime dağarcığının dil öğreniminde en önemli bileşen olduğunu belirtmektedir. Ayrıca, telaffuz, yazım kuralları ve imla, uzun ve karmaşık ifadeler, dilbilgisi, çağrışım ve deyimsele ifadeler de öğrenenler için birer zorluk teşkil etmektedir (Thornbury, 2002). Deyimlerin gerçek karşılıkları, mecazi anlamları ve konuşmadan çıkarılması, öğrenenlerin bu ifadeleri kullanmaktan kaçınmalarına yol açabilir (Ahmed ve diğerleri, 2022). Bununla beraber, kelime öğrenmedeki zorluklar yeterince anımsatıcı ve hafıza stratejileri bilmemekten kaynaklanabilir. Bağlamsal ipuçlarından kelimelerin anlamını tahmin edememek, İngilizce öğrenenler için kelime öğrenmede ayrı bir zorluk derecesine sahiptir (Afzal, 2019).

Oyunlaştırma, motive edici ve eğlenceli yönleriyle kelime öğrenmede yaşanan sorunların çözümü için faydalı bir teknik olabilir (Stephenson ve Rumley, 2005). Etkileşimli oyunlar, öğrencilerin kelimeleri ve uzun süreli belleklerini kullanmalarını gerektirir (Hashemi, 2021). Kelime bulmacaları, kelime avı gibi oyunlar öğrenciler arasında meydan okuma, rekabet, işbirliği yaratabilir (Gozcu ve Caganaga, 2016). Oyun sonunda verilen anlık geribildirimler, öğrencilerin telaffuz, dilbilgisi, imla, yanlış kelime seçimi gibi geliştirmeleri gereken yönleri belirlemelerine katkı sunabilir (Şenel ve Akman, 2016). Rol yapma ve simülasyon gibi oyunlaştırma araçları, öğrenilen kelimelerin yazma ve konuşma gibi yaratıcılık ve üretkenlik gerektiren becerilerde kullanımını destekleyebilir (Razali ve Ismail, 2017). Oyunlaştırmanın kelime öğrenimine katkılarının yanında, yapay zekâ destekli oyunlaştırma da birçok açıdan destek sağlayabilir. Sözlükler, görsel imajlar, çeviri araçları gibi sözcük yardımcılarıyla donatılan sohbet robotları,

öğrenenleri büyük ölçüde destekleyebilir (Alsadoon, 2021). Otomatik değerlendirme sistemleri, öğrenenlerin kelime öğreniminde yaşadığı başlıca zorluklardan biri olan telaffuz güçlüklerinde yardımcı olabilir (Ahn ve Lee, 2016). Ayrıca akıllı sanal gerçeklik araçları, kelimelerin bellekte uzun süreli tutulmasına katkı sağlayabilir (Lai ve Chen, 2023). Yapay zekâ destekli robotlar, rol yapma, hikaye anlatımı ve oyun tabanlı etkinliklere öğrencilerin coşkulu katılımını sağlayabilir (Binh ve Chau, 2023).

Bu çalışma, birkaç yönden önem taşımaktadır. İlk olarak, yabancı dil olarak İngilizce öğrenenlerin kelime öğrenimi ile ilgili yaşadıkları zorluklar ve sorunlar göz önünde bulundurulduğunda, kelime bilgisinin öneminin altı çizilmektedir (Cameron, 2001). Kelime bilgisi, çok boyutlu olduğundan sadece kelimenin anlamını bilmek tek başına yeterli değildir (Calvo-Ferrer ve Medina, 2021). Sınıf içinde ve dışında oynanan eğitsel oyunlar, daha aktif katılım sağlayarak ve ilgi odağı haline gelerek, öğrencilerin kelime bilgisi ve kapasitelerini geliştirebilir (Katemba, 2022). Yapay zekânın kelime öğrenimi için oyunlaştırma ile entegrasyonu, öğrenci gelişimini yakından takip etmeye, içerik ve öğrenilecek kelime seçiminin öğrenci isteklerine, ihtiyaçlarına, öğrenme hızına ve mevcut seviyelerine göre ayarlanmasına olanak sunabilir (Schmidt ve Strasser, 2022). Literatürdeki önceki çalışmaların çoğu dört temel dil becerisi ve telaffuza odaklanırken, kelime öğrenimi ile ilgili yapay zekâ destekli oyunlaştırmanın kullanımına ilişkin bir araştırma boşluğu bulunmaktadır. Ayrıca, kelime öğreniminde yapay zekâ ile geliştirilmiş oyunlaştırma üzerine doğrudan bir çalışma yoktur.

Bu çalışma, İngilizce'nin yabancı dil olarak öğrenilmesi bağlamında kelime öğreniminde karşılaşılan sorunlara çözüm sunmak için, oyunlaştırmanın geleneksel ortamlarda kullanımının kelime öğrenimine etkilerini araştırmayı amaçlamaktadır. Ayrıca, yapay zekâ ile desteklenen oyunlaştırmanın yabancı dil olarak İngilizce öğrenenlerin kelime öğrenimine etkilerini araştırmayı amaçlamaktadır. Son olarak, geleneksel ortamlarda oyunlaştırmanın kullanımı ile yapay zekâ destekli oyunlaştırmanın kullanımı arasında kelime öğrenimi açısından fark olup olmadığı araştırmanın konusudur. Yarı deneysel bir araştırma tasarımı benimseyen ve 2023-2024 eğitim-öğretim yılı bahar döneminde gerçekleştirilen bu araştırmaya, Yalova'da bir devlet ortaokulu olan Yalova Abdülhamid Han Ortaokulu'nda beşinci sınıfta öğrenim gören 32 öğrenci katılmıştır. Katılımcıların 15'i (%47) kız, 17'si (%53) erkektir ve yaş ortalamaları 11'dir. Araştırmaya katılan öğrencilerin tamamının ana dili Türkçe'dir. Çalışmaya katılan öğrencilerin İngilizce

yeterlilikleri A1 seviyesindedir ve haftada 11 saat İngilizce dersi görmektedirler. Beş haftalık uygulama süreci ile ön test ve son test uygulaması dahil olmak üzere toplam yedi hafta süren bu çalışmada, katılımcıların demografik bilgilerine yönelik anket ve kelime testi (Bkz. Ek A) hakkında veri toplamak için toplamda iki adet ölçek kullanılmış ve son testten sonra her gruptan beş katılımcıyla bir odak görüşmesi yapılmıştır. Katılımcıların kelime bilgisi düzeylerini araştırmak amacıyla Tapia (2021) tarafından geliştirilen kelime testi ön test ve son test olarak kullanılarak katılımcıların kelime bilgisi başarı düzeyleri incelenmiştir. Araştırmada gerçekleştirilen diğer analizlerin yanı sıra odak grup görüşmesi yapılmış ve görüşmeden elde edilen veriler ayrıntılı bir şekilde incelenmiştir. Beşi kontrol grubundan, beşi deney grubundan olmak üzere toplam on katılımcıyla yüz yüze gerçekleştirilen ve 40 dakika süren odak grup görüşmesinde katılımcıların görüşlerini araştırmak ve incelemek için oyunlaştırma, yapay zekâ destekli oyunlaştırma ve kelime öğrenimi üzerine toplam beş soru yöneltilmiştir. Analiz süreci, katılımcıların görüşlerinin derinlemesine değerlendirilmesi ve kontrol ve deney grupları arasındaki farklılıkların muhtemel sebeplerinin tespit edilmesi amacıyla gerçekleştirilmiştir.

Çalışmanın sonunda elde edilen bulgulara göre, geleneksel oyunlaştırmanın kelime öğrenme sürecini öğrenciler için daha etkileşimli hale getirerek kelimeleri akılda tutmayı kolaylaştırdığı bulunmuştur. Bununla birlikte, yapay zekâ ile desteklenmiş oyunlaştırma uygulaması, ChatGPT gibi gelişmiş teknolojiler ve makine öğrenmesi algoritmaları, uyarlanabilir ve kişiselleştirilmiş öğrenme sistemleri, gerçek zamanlı geribildirim ve doğal dil işleme mekanizmalarıyla birleştirilerek bu faydaları bir adım öteye taşımıştır. Yapay zekâ destekli oyunlaştırmanın, öğrencilerin kelime öğrenme performansını zayıf bir seviyeden, çok tatmin edici bir seviyeye getirerek, öğrencileri kelime öğrenmede geleneksel oyunlaştırma uygulamasına kıyasla daha yetkin hale getirdiği saptanmıştır. Tüm bunlara ek olarak, yapay zekâ destekli oyunlaştırmanın gelişmiş ve bağlamsal olarak zengin nitelikleri ve sunduğu fırsatlar sayesinde geleneksel oyunlaştırma yöntemine kıyasla öğrencilerin alıcı ve üretken kelime dağarcığı kapasitelerini ve kelimelerin akılda tutulma düzeyini önemli ölçüde artırdığı bulunmuştur. Böylelikle yeni öğrenilen kelimelerin gerçek hayatta da hatırlanması ve iletişim sürecinde etkili bir biçimde kullanılması sonucu ortaya çıkar. Yapılan odak görüşmesinin bulguları yukarıda belirtilen sonuçları onaylamakla birlikte, oyunlaştırılmış kelime öğreniminin eğlenceli bir yolla öğrenmeyi, pratik yapmayı ve kelimeleri tekrar etme fırsatı sunduğu sonucunu ortaya

çıkarmıştır. Ayrıca oyunların öğrenme isteğini, dikkati, motivasyonu ve ilgiyi, sosyal gelişimi, görsel hafızayı ve hatırlamayı önemli ölçüde artırdığı sonucuna varılmıştır. Yapay zekâ desteğinin, sözlüklere kıyasla daha özgün ve kişiselleştirilmiş cümle kurmaya destek sağladığı sonucu da diğer önemli bir bulgudur. Katılımcıların dijital ve çağa uygun araçları daha çok tercih ettikleri ortaya çıkmıştır.

Yukarıda sunulan sonuçlara göre bazı öneriler sunulabilir. İlk olarak öğretmenler, öğrencilerin kelime dağarcığını ve hatırlama düzeyini geliştirmek, eğlenceli, ilgi çekici ve motive edici, işbirlikçi, rekabetçi, araştırma odaklı ve huzurlu bir sınıf iklimi oluşturmak için oyunlarla birlikte ChatGPT gibi yapay zekâ sohbet araçlarını kullanmalıdır. Öğretmenler kelime öğretimi derslerini planlarken ChatGPT'nin özelliklerini, öğrencilerinin yaşları, seviyeleri ve ilgi alanları ile eşleştirmeyi göz önünde bulundurmalıdır. ChatGPT yapay zekâ uygulamasının öğrencilerin ilerlemesini kontrol etmesi ve kelime dağarcığı konusundaki zayıf yönlerini geliştirmek için öğrencilere anlamlı ve destekleyici geribildirimler vermesi öğretmenlerce önemsenmelidir. Bu yapay zekâ uygulaması, oyunlarda yer alan avatar, puan, skor tabloları, rozet, meydan okuma gibi ilgi çekici unsurlarla zenginleştirilmelidir. ChatGPT yapay zekâ uygulamasının sohbet özelliği sayesinde tesadüfe dayalı ve gizil öğrenmeye dayalı yeni kelimeler öğrenileceği de aşikardır. Yapay zekâ uygulaması kelimelerin uzun süreli belleğe yerleştirilmesini hedeflemekle birlikte, mobil uygulama üzerinden anlık bildirimler göndererek, öğrenenleri yeni kelimeleri cümlede kullanmaya ve tekrara teşvik etmelidir. Okul yönetimleri, ChatGPT gibi sohbet araçlarını ve oyunlaştırmayı gündemlerine alarak, İngilizce öğretmenlerinin seminerler, hizmet içi eğitimler, forumlar, konferanslar, bildiriler ve atölye çalışmaları ile kelime öğretimi konusundaki yetkinliklerini ve becerilerini geliştirmeye yönelik desteklemelidir. Gerekli internet ve donanım altyapısı oluşturularak her öğrencinin eşit ve adil bir biçimde fırsatlardan istifade etmesi sağlanmalıdır. Müfredat ve program geliştirme uzmanlarının yapay zekâ ve oyunlaştırmının entegrasyonu ile ilgili olarak İngilizce öğretmenlerinin öneri ve görüşlerine de başvurarak, pilot uygulamaları yaptıktan sonra elde edilen geribildirimler doğrultusunda yenilikçi çalışmaları ülke çapında yaygınlaştırmaları önerilmektedir. Son olarak politika yapıcılar, okullara ve üniversitelere fon ayırarak yapay zekâ ve oyunlaştırma teknolojilerine yatırım yapmalıdır. İngilizce öğretmenlerinin ve akademisyenlerin bakış açıları ve önerileri doğrultusunda yapay zekâ destekli oyunlaştırmının kelime öğretimine entegrasyonuna yardımcı olacak

politikalar geliştirilmelidir. Milli Eğitim Bakanlığı, Türkiye'deki kalite standartlarını karşılamak için İngilizce derslerinde kelime öğretimi için yapay zekâ ve oyunların eşgüdümlü kullanımına yönelik açık ve net kararlar almalıdır.

Anahtar Kelimeler: Yabancı dil olarak İngilizce öğretimi, Yapay zekâ , ChatGPT, Oyunlaştırma, Kelime Öğrenimi.

ABSTRACT

The Efficacy of AI-Enhanced Gamification for Vocabulary Learning in the EFL Learning Context

Hoşer, Serdar

Master's Thesis, Department of Foreign Language Teaching

Supervisor: Prof. Dr., Selami Aydın

June 2024

Vocabulary is crucial for EFL learners due to its impact on communication (Wilkins, 1972), reading (Brooks et al., 2021), listening (Mecartty, 2000), writing, and speaking (Kılıç, 2019) and many previous studies show that lack of vocabulary is one of the main problems that learners experience in four essential skills. One of the solutions to solve this problem is the integration of gamification and AI which has attracted the attention in EFL teaching. Thanks to recent innovations and the popularity of AI platforms, many online EFL platforms have been utilized by EFL learners; however, no studies have been conducted on AI-enhanced gamification's effect on vocabulary learning, especially in the Turkish EFL context. Thus, this study aims to explore the effects of AI-enhanced gamification on vocabulary learning. In addition, it also aims to examine Turkish EFL learners' vocabulary retention levels and to compare traditional gamification of vocabulary to AI-enhanced gamification of vocabulary. In this quasi-experimental study, the data were collected from 32 secondary school students through a background questionnaire and the vocabulary test by Tapia (2021). The participants were assigned to control and experimental groups. The control group continued to use games while the experimental group used AI and games together to carry out the vocabulary learning activities for five weeks. The SPSS software was used for data analysis. The findings revealed that AI had a significant effect on vocabulary learning. In addition, the experimental group experienced more positive changes in vocabulary retention levels, especially in receptive and productive vocabulary retention. Therefore, it is suggested that teachers should be aware of the positive effects of the use of AI-enhanced gamification, and it should be integrated into vocabulary teaching practices as supplementary tools with suitable methods and techniques to create more effective vocabulary learning environments.

Keywords: English as a foreign language, Artificial intelligence, ChatGPT, Gamification, Vocabulary learning

ACKNOWLEDGEMENTS

First and foremost, I would like to express my sincere gratitude to my supervisor, Prof. Dr. Selami Aydın for his guidance, support, motivation, and encouragement throughout the process of writing this thesis. I have to confess that I have learned a lot from him during this journey. His insights and expertise illuminated my way and made the process a lot easier. I am also so grateful for his patience, sincerity, dynamism, and the fact that he kept me going until the end.

I also want to thank my committee members, Asst. Prof. Ferdane Denkcı Akkaş and Assoc. Prof. Burcu Ünal, for their invaluable feedback, support, and contributions to my thesis. Their insightful comments and recommendations greatly improved the quality of my work.

Additionally, I would like to thank my professors in the Department of ELT at İstanbul Medeniyet University, Lect. Dr. Abdullah Yıldız and Lect. Dr. Derya Oruç, who shed light on me with their knowledge throughout my education and gave me the enthusiasm to walk on the academic path with their encouraging words.

I want to express my deepest gratitude to my beloved parents, Nevin and Necat, for their endless support and love. Knowing that they were always with me gave me strength on this journey. They have the biggest role in shaping who I am now.

I would also like to express my special thanks to my all English teachers, who encouraged and supported me throughout my education.

Serdar HOŞER

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	xiii
TABLE OF CONTENTS	xiv
LIST OF TABLES	i
LIST OF FIGURES.....	ii
LIST OF ABBREVIATIONS	iii
INTRODUCTION.....	1
1.1. Background of the Study.....	1
1.2. Statement of the Problem	4
1.3. Aims of the Study.....	7
1.4. Significance of the Study	8
1.5. Research Questions	10
2.RELATED LITERATURE	11
2.1. Theoretical Background	11
2.1.1. Vocabulary	11
2.1.2. Gamification.....	14
2.1.3. Artificial Intelligence	19
2.2. Literature Review.....	25
2.2.1. Research on Vocabulary.....	25
2.2.2. Research on Vocabulary and Technology	26
2.2.3. Research on Vocabulary and Gamification	30
2.2.3.4 Research on AI-enhanced gamification and language skills	32
2.2.3.5 Research on AI-enhanced gamification for vocabulary learning	33
2.2.3.6 Conclusion.....	35
3. METHODOLOGY	37
3.1. Research Design.....	37
3.2. Participants	37
3.3. Tools.....	38
3.4. Procedure.....	41
3.4.1. Pre-test Implementation	43
3.4.2. The Practice Process.....	43
3.4.3. Post-test Implementation.....	54
3.5. Data Analysis	54
4. FINDINGS	56
4.1. Research Question 1: Does the use of gamification in traditional environments	

contribute to vocabulary learning among EFL learners?	56
4.1.1. The Vocabulary Learning Levels of the Control Group	56
4.1.2. The Vocabulary Learning Levels of the Experimental Group	57
4.2. Research Question 2: Does the use of AI-enhanced gamification contribute to vocabulary learning among EFL learners?	59
4.2.1. Gamification Effect on Vocabulary Learning	59
4.2.2. AI-enhanced Gamification Effect on Vocabulary Learning	62
4.3. Research Question 3: Is there a difference between the use of gamification in traditional environments and AI-enhanced gamification regarding vocabulary learning among EFL learners?	67
4.3.1. Comparison of Gamification and AI-enhanced Gamification	67
5. CONCLUSIONS and DISCUSSION	72
5.1. Conclusions	72
5.2. Pedagogical Implications	75
5.3. Practical Recommendations	78
5.4. Limitations	80
5.5. Recommendations for Further Research	81
REFERENCES	83
Appendix A	110
APPENDIX B	114
Appendix C	115
APPENDIX D	122
APPENDIX E	126
Appendix F	133
APPENDIX G	137
APPENDIX H	142
Özgeçmiş	147

LIST OF TABLES

Table 1	Validation of Vocabulary Test.....	41
Table 2	The Organization of the Vocabulary Test.....	41
Table 3	Reliability Coefficients of the Pre and Post-Tests	54
Table 4	The Mean Scores for Vocabulary Retention Level in the Control Group	57
Table 5	Comparison of Pre-and Post-Tests Scores of the Control Group (Wilcoxon Test).....	57
Table 6	The Mean Scores for Vocabulary Retention Level in the Experimental Group	58
Table 7	Comparison of Pre-test and Post-test Scores of the Experimental Group (Wilcoxon Test)	58
Table 8	Pre-test Scores for the Control and Experimental Groups (Mann-Whitney U Test).....	67
Table 9	The Mann-Whitney U Test Results for the Pre-tests of the Control and Experimental Groups	68
Table 10	Post-test Scores for the Control and Experimental Groups (Mann-Whitney U Test).....	69
Table 11	The Mann-Whitney U Test Results for the Post-tests of the Control and Experimental Groups	71

LIST OF FIGURES

Figure 1	The flowchart of the randomized pre-test-post-test control and experimental design (Fraenkel et al., 2012)	43
Figure 2	Wordwall flash cards, weekly target vocabulary, Learn Hip digital word game links, ChatGPT prompt cards	45
Figure 3	Example contextual study of target words and story cards	47
Figure 4	Taboo cards.....	48
Figure 5	Worksheet study, Heads Up game words, and Kahoot game	52
Figure 6	Wordwall flash cards,example mnemonics, and Jeopardy game links.....	53

LIST OF ABBREVIATIONS

EFL	: English as a Foreign Language
AI	: Artificial Intelligence
VR	: Virtual Reality
Chatbot	: Chatting Robot
3D	: Three-Dimensional
RPG	: Role-Playing Game
ZPD	: Zone of Proximal Development
NLP	: Natural Language Processing
NMT	: Neural Machine Translation
AES	: Automatic Evaluation System
ML	: Machine Learning
ITS	: Intelligent Tutoring System
AC	: Affective Computing
NN	: Neural Network
CLIL	: Content and Language Integrated Learning
MT	: Machine Translation
ANN	: Artificial Neural Network
ASR	: Automatic Speech Recognition

DS	: Digital Story
CEFR	: Common European Framework of Reference for Languages
MONE	: Ministry of National Education
SPSS	: The Statistical Package for Social Sciences

INTRODUCTION

1.1. Background of the Study

For several reasons, vocabulary plays a significant role in the EFL learning context. First, it has the fundamental function of transmitting meaningful messages between interlocutors. Wilkins (1972) states that “*Without grammar, very little can be conveyed; without vocabulary, nothing can be conveyed.*”(Wilkins, 1972). One-word utterances of babies referring to objects or people around them are enough for them to express themselves (Hutauruk, 2015). Second, vocabulary learning is paramount for improving reading skills development in the EFL context (Brooks et al., 2021). It is a challenge to understand written materials without knowing the meaning of the glossary. The more vocabulary is learned, the easier, the faster, and more effectively reading skills can be improved. Third, vocabulary learning helps us improve our listening; thus, it plays a significant role in listening comprehension (Mecartty, 2000). Learning vocabulary is an essential requirement for learners to decode the sounds of the language and grasp its meaning. Finally, vocabulary is the crucial building block for EFL learners to develop productive modalities, including writing and speaking skills (Kılıç, 2019). Under this perspective, gamification may constitute a considerable place in learning vocabulary among EFL learners.

As mentioned above, gamification is of great importance in terms of learning vocabulary for several reasons. First, gamification captures learners’ attention and boosts their active participation while learning new words (Ahmed et al., 2022). It assists students in avoiding negative thoughts and prejudices against foreign

language and difficult words, their pronunciation, and spelling. In contrast, gamification creates positive viewpoints or attitudes towards learning vocabulary (Thurairasu, 2022). Second, gamification allows learners to revise words they have learned in flexible times at home (Waluyo & Bucol, 2021). Thus, gamification contributes to long-term vocabulary retention and permanent learning, provides regular revision of words, and enhances learning opportunities (Quynh, 2022). Next, learners can also use gamification as a strategy to change monotonous and traditional vocabulary learning into fun and interesting learning strategies (Waer, 2021). Considering the above-mentioned reasons why gamification is crucial for learning vocabulary in the EFL context, AI applications may support its efficiency.

AI-enhanced gamification may also be of great importance for learning vocabulary for several reasons. First, AI-supported gamification may foster active and participatory learning opportunities that adjust to personal development, making the vocabulary learning process more pleasurable and productive (Sumakul et al., 2022). The dynamic, motivating, and appealing features of gamification may match the adjustability of AI. Second, by taking advantage of AI algorithms, AI systems may reveal students' hidden capabilities, suggesting specialized challenges and opportunities to make the most of vocabulary retention (Zhai & Wibowo, 2023). AI-enhanced gamification may transform vocabulary learning into an active, efficient, and educational effort in terms of learners (Abbas et al., 2023). In other words, the feeling of success and improvement may encourage learners to maintain learning vocabulary. Third, the application of AI may encourage learners to learn more words daily by considerably increasing their motivation levels (Li, 2021). The more they get ahead, the easier it may be for them to focus on learning new words, and their

intrinsic motivation is likely to increase. Finally, AI-enhanced gamification of vocabulary may address learners' personal needs and desires related to EFL learning (Abbas et al., 2023). In this way, everyone may show progress on their side. Individualized learning opportunities of AI may support learners' learning vocabulary (Tapalova & Zhiyenbayeva, 2022). To conclude, thanks to the innovations in AI and technology, it is possible for AI-supported gamification in vocabulary learning to flourish and change the way people learn vocabulary in the EFL context.

In summary, learning vocabulary is a significant area in foreign language learning and plays a critical role in the EFL context (Cameron, 2001b). It is the key to communication (Wilkins, 1972), reading skills (Brooks et al., 2021), listening comprehension (Mecartty, 2000), and productive skills development (Kılıç, 2019). Furthermore, gamification plays a significant role in learning vocabulary in the EFL context. It is practical to attract students' attention and provide their active participation in learning words (Ahmed et al., 2022), to create positive emotions about learning vocabulary (Thurairasu, 2022), to make regular vocabulary revisions (Waluyo & Bucol, 2021), and to have exciting learning strategies while increasing vocabulary knowledge daily (Waer, 2021). Next, AI-enhanced gamification may be beneficial for vocabulary learning. It may result in enjoyable and fruitful learning experiences (Sumakul et al., 2022), uncovering students' abilities and assisting vocabulary retention (Zhai & Wibowo, 2023), enhancing motivation for vocabulary learning (Li, 2021), and taking individual differences and needs into account while learning vocabulary (Tapalova & Zhiyenbayeva, 2022). Thus, for a deeper and better understanding of the role of AI-enhanced gamification, it is important to research its effect on language learning, specifically vocabulary learning.

1.2. Statement of the Problem

Vocabulary has been identified as one of the biggest challenges for EFL learners (Meara, 1980). Contrary to syntax and phonology, vocabulary does not have norms that students can adhere to while they learn and expand their vocabulary. In other words, while learning L2 vocabulary, it is unclear what rules to follow or which words to master first (Alqahtani, 2015b). More specifically, several reasons account for why vocabulary learning is problematic for learners in the EFL context. First, learning the meaning of new vocabulary items is a heavy burden on students. Students encounter problems in finding out the meanings of new words, terminological or technical words, multiple-meaning words, compound words, homophones, false friends, or culture-specific words (Altyari, 2017). Oxford (1990) mentions that vocabulary is probably the most substantial and uncontrollable component in language learning, whether it is in a native or foreign language context, owing to its thousands of diverse definitions and uses. Second, some factors that make learning some vocabulary harder for learners are pronunciation, spelling, length and complexity, grammar, range, connotation, and idiomaticity (Thornbury, 2002). Words with identical forms can cause confusion in both spelling and pronunciation among learners (Schmitt, 2000). In addition, idioms' literal correspondents, figurative meanings, and elimination from the conversation may cause learners to abstain from using them (Ahmed et al., 2022). Third, learners struggle to practice their learned words, memorize them, and guess the meaning through context. Since vocabulary reflects the need to interact with others (Neuman & Dwyer 2009), learners are required to have enough opportunities to practice it

accurately, fluently, and efficiently in productive modalities. Furthermore, difficulties in memorizing vocabulary may stem from not knowing enough mnemonics or memory strategies. Not being able to predict the meaning of words from contextual clues is another challenge for EFL learners while learning vocabulary (Afzal, 2019). Last but not least, besides the various factors affecting learning vocabulary, it is beneficial to mention gamified vocabulary learning and related problems in the EFL context.

Gamification may be a useful technique for solving problematic issues concerning learning vocabulary by enabling the procedures to be more involving, motivating, and fun (Stephenson & Rumley, 2005). First, interactive games demand learners to use their vocabulary knowledge and strengthen long-term memory (Hashemi, 2021). Word puzzles, crossword puzzles, and word hunt games can create challenge, competition, and collaboration among learners (Gozcu & Caganaga, 2016). Second, immediate feedback given at the end of games may help students define areas where they need improvement such as pronunciation, spelling, grammar, wrong word choices, etc. (Şenel & Akman, 2016). Gamification also supports learning from mistakes and reduces the time spent on learning (An, 2020). Next, role-playing games or simulations may put learners into situations where they need to use the new vocabulary they have learned in productive skills such as writing and speaking (Razali & Ismail, 2017). While gamification of vocabulary learning in the EFL context may have a lot of advantages, there may also be some problematic factors to consider (Demirbilek & Talan, 2022). Unless it is used carefully, excessive use of gamification may switch students' attention from the actual learning objective to unproductive learning output (Almeida et al., 2023). Prioritizing fun elements over learning

outcomes may result in incomplete learning gains (Jaftha et al., 2021). If the curriculum objectives and gamification procedures do not align, incoherent learning experiences may emerge (Wulantari et al., 2023). Gamification of vocabulary may also neglect to learn complex language structures such as idioms, and chunks that learners need more to practice these phrases in real life. Furthermore, using gamification components overwhelmingly may make learners feel disinterested after a while (Meşe & Dursun, 2018). Instead of encouraging the effective use of vocabulary in different contexts or registers, gamification may boost rote and isolated vocabulary learning (Zohrabi et al., 2018). Considering these factors affecting vocabulary learning, AI-supported gamification can be an applicable solution to help EFL students.

AI-supported gamification may strengthen the learning of vocabulary in the EFL context for several reasons. First, chatbots created and equipped with vocabulary aids such as dictionaries, visuals, translation tools, and concordance may supply learners with synonyms of words, rich input, long-term memory support, contextual clues, and practice opportunities (Alsadoon, 2021). The visual support may be useful for visual learners, making it easier to recall word meanings from memory (Sadeghi & Farzizadeh, 2013). Second, automatic evaluation systems in the EFL context may help learners' pronunciation difficulties related to vocabulary learning (Ahn & Lee, 2016). Pronunciation practice supported by AI may make it possible for words to be stored in long-term memory (Kazu & Kuvvetli, 2023). Third, intelligent VR tools in the EFL context may improve vocabulary learning and retention for learners (Lai & Chen, 2023). Furthermore, they benefit from speech recognition to analyze learners' speech input and output during conversation which can give support and feedback to correct

errors and evaluate themselves (Heift & Schulze, 2007). Next, AI-supported translation applications can enable learners to easily search definitions, spellings, and pronunciations of words, sentences, and texts. Text-to-speech tools may also be beneficial for pronunciation and intonation (Ghafar et al., 2023). AI tools can automatically identify language expressions to make morphological analyses and suggest recommendations for vocabulary improvement (J. Liu et al., 2019). Moreover, AI-fueled toys or robots may teach students vocabulary and enable them to join role-play, storytelling, and game-based activities enthusiastically (Binh & Chau, 2023). The use of gamification components such as quizzes, marathons, and competitions may boost engagement and attract students' interests (Hovsepyan, 2022). A software application may help students learn sentence formation, collocations, or multi-word structures required to create accurate, error-free sentences (Ghafar et al., 2023). AI tools may effectively enhance students' vocabulary capacity by promptly addressing their problems.

1.3. Aims of the Study

As previously mentioned, learning vocabulary has been viewed as one of the most challenging concepts in the EFL context. From this perspective, limitless definitions and uses of words, spelling and pronunciation difficulties, idiomatic and abstract expressions, problems related to retention and guessing the meanings of words from the context, and lack of gamification and enjoyment components while learning new words play a significant role in putting obstacles in the way of learning vocabulary for the EFL students. Considering these problems, the support of AI may be beneficial to encourage students to learn vocabulary in a motivating, high-quality, and enjoyable digital environment. In this regard, there is a gap to be filled in the

literature showing AI-supported gamification for learning vocabulary, particularly in the Turkish EFL context. Therefore, it is assumed that the current study would contribute to the field by benefiting from the results. In short, it is essential to research the issue addressed within the scope of this current study. With these concerns in mind, the current study aims to determine the efficacy of AI-enhanced gamification for vocabulary learning in the Turkish EFL context.

1.4. Significance of the Study

The current study is significant in several ways. First, it underlines the significance of vocabulary which is central to basic language skills in the EFL context (Cameron, 2001b), given that Turkish EFL learners have difficulties and problems related to learning vocabulary (Kim et al., 2018). Only knowing the meaning is not enough on its own since learning a new word requires familiarity with its pronunciation, spelling, parts of speech, and collocations, too (Calvo-Ferrer & Medina, 2021). The study tries to help learners overcome their problems related to these issues. Second, the current study contributes to the related literature by providing essential information on the gamification of vocabulary learning. The educational games implemented inside and outside the class may enrich vocabulary knowledge and the size of EFL learners by making them more engaged and attracted to this method (Katemba, 2022). Thanks to the developments in smartphone applications and technology in the last few decades, gamified vocabulary tools have become trendy and necessary to be utilized in education (Alshumaimeri, 2008). Thus, the study underlines the importance of gamification for vocabulary learning. Third, the integration of AI with gamification for vocabulary learning may enable researchers and instructors to research individualized or personalized learning

phenomena, follow learners' progress closely, and adjust content and word choice according to learners' needs, desires, learning pace, and current levels (Schmidt & Strasser, 2022). From this perspective, the current study may help solve the above-mentioned problems related to learning vocabulary, choose suitable vocabulary learning strategies, support vocabulary retention effectively, and balance optimum difficulty levels according to individuals' achievement scores by filling significant gaps in the EFL context. In addition, this study may suggest a ground for the EFL context, providing desirable insights into the combination of AI technology and systematic vocabulary learning. In other words, when technology is integrated into vocabulary learning, the gamification method may replace traditional, rote-learning-based, and monotonous vocabulary learning methods used frequently by learners. Thus, the current study may help learners learn new words and use them in a lively, adaptable, and real-life context where vocabulary knowledge and skills improve effectively (Diaz et al., 2022). In the current literature, there has been a large number of studies carried out on the use of AI in the EFL context related to essential language skills including listening (Arini et al., 2022; Hong et al., 2016; Kim et al., 2019; Howard et al., 2023; Dizon, 2020; Suryana et al., 2020), speaking (Bashori et al., 2021; Ahn & Lee, 2016; Mohammadzadeh & Sarkhosh, 2018; Kim et al., 2019; Dizon, 2020; Howard et al., 2023; Moussalli & Cardoso, 2020; Tzu-Yu & Howard, 2023; Lee & Cho, 2020; Forsyth et al., 2019), writing (H. Kim et al., 2020; Bai & Hu, 2017; Gao, 2021; Alhaisoni & Alhaysony, 2017; S.-M. Lee, 2020; Beltran, 2017), reading (Alhaisoni & Alhaysony, 2017; Xu et al., 2019; Xiao & Hu, 2019; Kaoropthai et al., 2019; Zhang et al., 2019; Tang et al., 2022), pronunciation (Tai, 2022; Dizon, 2017; McCrocklin, 2016; Moussalli & Cardoso, 2020; Moustroufas & Digalakis, 2007; Bahi &

Necibi, 2020; Dai & Wu, 2023; Elimat & AbuSeileek, 2014). While most of the previous studies focused on basic language skills and pronunciation, there has been a lack of exploration of the use of AI-enhanced gamification concerning vocabulary learning. Moreover, there is no direct study on AI-enhanced gamification on vocabulary learning. In addition, no study focuses on the issue within the scope of the Turkish EFL context. Therefore, this study contributes to the related literature by researching the impacts of AI-enhanced gamification on EFL vocabulary learning in a state secondary school in Türkiye. Finally, it gives practical suggestions to researchers, teachers, curriculum, and mobile educational game application designers.

1.5. Research Questions

Concerning the problems regarding EFL vocabulary learning and the issues related to AI-enhanced gamification, as explained above, this study aims to find answers to the three following research questions:

- 1) Does the use of gamification in traditional environments contribute to vocabulary learning among EFL learners?
- 2) Does the use of AI-enhanced gamification contribute to vocabulary learning among EFL learners?
- 3) Is there a difference between the use of gamification in traditional environments and AI-enhanced gamification regarding vocabulary learning among EFL learners?

2.RELATED LITERATURE

This section includes two subsections. The first section includes the theoretical framework of the study consisting of *vocabulary*, *gamification*, and *AI-enhanced gamification* in the EFL context. The second section presents the related literature review on these variables of the study.

2.1. Theoretical Background

2.1.1. Vocabulary

The term *vocabulary* needs to be clarified since various definitions have been proposed for *vocabulary* in the EFL context. For instance, Oxford (1990) defines *vocabulary* as the most comprehensive and uncontrollable element of a language. Ghazal (2007) argues that *vocabulary* is the building block of a language because it labels things, guides human actions, and expresses opinions without which people cannot interact with others effectively and correctly. It is considered essential to function efficiently in the main language skills of reading, writing, speaking, and listening (Subon, 2013). While learning a foreign language, it is necessary to interact ideas and convey meaning (Alqahtani, 2015b). Read (2000) defines *vocabulary* as words that symbolize the essential units of meaning and assist the formulation of clauses, passages, and texts. Furthermore, it is defined as a set of words relevant to each person or a branch of different disciplines (Graves, 2000). Last, Gardner (2013) defines *vocabulary* as having a wide perspective that goes beyond language structures. As a result, *vocabulary* can be defined as an essential key and a core unit to express ideas, communicate, and build language skills in the EFL context. In

addition to the above-mentioned definitions for *vocabulary*, it is also categorized under different groups and names.

Various types or categories have been suggested for *vocabulary* in the EFL context. According to Hiebert & Kamil (2005), *vocabulary* is categorized into two categories, *oral* and *print*, and knowledge, too, comes in two kinds: *receptive* and *productive*. The *oral vocabulary* refers to words whose meanings are known by the learners during oral reading and speaking activities. On the other hand, *print vocabulary* refers to words whose meanings are known by the learners while they write or do silent reading activities. *Receptive vocabulary* refers to a set of less frequent words for which language learners assign meanings while listening or reading. On the contrary, *productive vocabulary* refers to a set of words that are more frequent among language learners during spoken or written production (Hiebert & Kamil, 2005). Moreover, *vocabulary* has two kinds: *active* and *passive*. *Active vocabulary* refers to the words taught to language learners, who can use these learned expressions in their speech or written productions. On the other hand, *passive vocabulary* represents the words language learners notice and get their meaning from the context. *Passive vocabulary* generally occurs in a listening or reading activity (Harmer, 2007). In addition, *vocabulary* is categorized as *sight-word vocabulary* which refers to quick recognition of vocabulary by language learners; *meaning-vocabulary* which refers to words understood by learners; *listening vocabulary* which represents the understanding of spoken words; *academic vocabulary* which refers to the *content-specific vocabulary* (Antonacci & O’Callaghan, 2012). Apart from these different types of vocabulary, it is necessary to mention the theories and hypotheses related to EFL *vocabulary*.

Several approaches, theories, hypotheses, and models may be related to EFL vocabulary. First, *The Lexical Approach* (Lewis, 1993) suggests the centrality of vocabulary to the language structure and focuses chiefly on the role of *multi-word units*, in other words, *chunks* and collocations. This approach mainly focuses on *lexical units* rather than grammar rules. Their key role in foreign language learning is emphasized. For example, using *binomials*, *idioms*, *similes*, *proverbs*, *exclamations*, *compounds*, and *collocations* helps with fluent speech and vocabulary enhancement (Richards & Rodgers, 2014). Second, *The Comprehensible Output Hypothesis* (Swain, 1985) suggests that productive modalities, such as writing and speaking, can support vocabulary learning. When learned words are used in learners' output, it reinforces the understanding and retention of vocabulary. When learners make mistakes and notice the gaps in their output, it enables them to find corrections, fill in them, and determine areas where they need to improve their vocabulary. The active use of language to interact with others engages and motivates learners to practice and learn new words (Ortega, 2013). Third, Krashen's (1985) *Input Hypothesis* suggests exposure to a wide variety of words in meaningful contexts where *comprehensible input* exists is a crucial element for efficient vocabulary learning (Krashen, 1989). To enhance vocabulary capacity based on the hypothesis, a rich and varied input utilizing engaging and attractive reading texts and other authentic language materials is a significant contributor. Vocabulary learning is suggested to be connected with meaningful and comprehensible contexts. For effective learning, vocabulary to be learned is also suggested to be slightly above the students' current levels. Next, Schmidt's (1990) *Noticing Hypothesis* suggests learners consciously be aware of new words in the input to learn them efficiently. According to the hypothesis, the

possibility of recall and use decreases if language learners do not pay attention to the vocabulary in context. When words are noticed in a language material, it becomes easier for learners to connect them to their existing schemata. Providing a rich and meaningful comprehension related to the use of *vocabulary* and noticing words can support long-term *vocabulary* retention, too. (Ortega, 2013). After that, *Frequency-based theories* underline the significance of exposing language learners to the most commonly used vocabulary. Focusing on high-frequency words can be beneficial for *vocabulary* and other language skills. Learning these words is crucial for comprehension of written or spoken materials, overall language proficiency, and fluency. It helps *vocabulary* expansion and effective communication (Nation, 2006). Last, *the Incidental Learning Hypothesis* (Nagy, Herman & Anderson, 1985) suggests that *vocabulary* is learned through repeated exposures in different contexts as a by-product and without an intent to learn while doing other language activities (Xu, 2010). In addition to explicit learning, *incidental vocabulary learning* helps learners considerably enhance their vocabulary capabilities. Vocabulary learning happens while watching a film, reading books for pleasure, listening to podcasts, or during real conversations with people. Such authentic contexts can lead to a deeper understanding of words' meaning and use.

2.1.2. Gamification

The term *gamification* is defined as the method of reaching a goal depending on game elements, such as *points*, *scores*, and *awards*. It is also a kind of digital literacy where many features of meaning-making and processing take place (Ahmed et al., 2022). Sheldon (2020) defines it as the application of game components to non-game activities. Moreover, Khaleel et al. (2016) define *gamification* as utilizing game

elements to boost learners' engagement with computer-assisted technology to solve problems with electronic applications. Werbach and Hunter (2012) define *gamification* as a problem-solving technique that includes game characteristics and game-design features in conventional non-game settings. It is also defined as empowering non-game activities by adding features such as involvement, competition, collaboration, and engagement (Deterding et al., 2011). Genç Ersoy and Belet Boyacı (2021) define *gamification* as an approach that keeps students attached to the system by creating incentives and maintaining motivation while transmitting educational content that does not include a game. In brief, *gamification* refers to applying game-based components and features to non-game activities. In addition to the above-mentioned definitions of *gamification*, there are different types and categories related to *gamification in vocabulary learning* in the EFL context.

Various types or forms of *gamification* have been used for learning vocabulary in the EFL context. These are *non-digital* and *digital games* to learn *vocabulary*. According to Naik (2014), a *non-digital game* refers to physical or visual activities that depend on boards, cards, and palpable materials, while a *digital game* refers to different kinds of mobile, computer, or video-based educational activities. *Non-digital games* include flashcard games, word puzzles such as crossword games, word search, anagrams, hangman, board games, card games, vocabulary challenges, and competitions. *Flashcard games* are activities or drills that are carried out depending on flashcards as materials (Pham & Dang, 2022). These games can be used to guess words' meanings, match words with their synonyms, classify word categories, tell stories, introduce new words, and revise words learned (Pham & Dang, 2022). *Word puzzles* provide opportunities for learners to revise and practice words learned

through crossword games, word searches, anagrams, and hangman games. (Njoroge et al., 2013). *Crossword puzzle games* include squares to be filled with words, one letter per square. The meanings of words are shown by numbers corresponding to the squares (Dhand, 1990). *Word search games* generally provide a list of hidden words, but more challenging ones allow the learners to predict them (Al-Furqon, 2017). In the *Hangman game*, dashes are used to symbolize words, and players try to decipher it by predicting letters one by one (Ibna Seraj & Habil, 2019). *Board games* are tools to engage learners and foster their self-confidence while learning vocabulary and revising learned words on a board (Zafiri, 2017). They help learners practice and revise words (M. F. Graves et al., 2013). *Scrabble* is an example of a board game for learning vocabulary. In addition, *vocabulary learning challenges and competitions* are very popular non-digital classroom practices that depend on grouping students in class to create cooperation and competition among them (Bakhsh, 2016). These games can stimulate learners and help enhance their gaming focus (Wu et al., 2010). The second category is related to the *digital gamification* of vocabulary. *Vocabulary learning applications* on smartphones include interactive quizzes, challenges, and awards for learners (Kacetl & Klimova, 2019). These applications integrate *gamification* components into their *vocabulary* sections, with scores, progress tracking, and rewards. Some examples of *digital games* for learning vocabulary are tutorial games, simulation games, role-playing games, motion-sensing games, 3D virtual games, adventure games, card games, and board games (Zou et al., 2019). *Tutorial games* are video games designed specifically for educational goals, such as learning vocabulary, and include a small number of game qualities (Cao & Liu, 2022). *Tutorial games* help students learn vocabulary and phrasal expressions naturally and

frequently in contexts (Seli & Santosa, 2022). *Simulation games* include real or unreal contexts where gamers try to find solutions to problems and complete the necessary missions related to words as quickly as possible (Khenissi et al., 2016). *Simulation games* include appealing visuals and sound effects that illustrate an ordinary gaming atmosphere for learners (Lin, 2015). *Role-playing games* give each player a role to act out to achieve their goals (Cornillie et al., 2012). *RPGs* usually enable meaning-making from riddles and quests and increase *vocabulary* (Harbord et al., 2021). *Kinect motion-sensing games* catch players' body movements and use these to complete the game successfully (Chuang & Kuo, 2016). They enable movement and gesture-based interactions and active in-game activities to sustain learners' interest while learning a language (Hung et al., 2017). Another category is *3D virtual games* that include a three-dimensional sense for better immersion (Li, 2023). In *3D* environments, players' graphical symbols called *avatars* interact with other *avatars* and objects around, which enables gamers to communicate and use *vocabulary* in the target language in real-life scenarios (Berns et al., 2013). Moreover, card games, board games, and flashcard games also have digital versions for learning *vocabulary* in or out of the classroom. Apart from these different types of games, it is necessary to mention theories and hypotheses related to *gamification*.

Several theories and hypotheses are related to *gamification of vocabulary learning* in the EFL context. First, Laufer and Hulstijn's (2001) *The Involvement Load Hypothesis* states that the efficiency of a task in supporting *vocabulary* learning is influenced by the task-induced involvement load, which is the total of significance degrees of the features having motivational and cognitive qualities: *need* (a learner's desire to finish doing the activity), *search* (a learner's effort to look up a

vocabulary's meaning, use), and *evaluation* (a learner's comparison of *vocabulary* with its meaning and use, or constructing new contexts). The *need* element is related to motivational features, such as the need to accomplish something. The *search* and *evaluation* elements are related to cognitive features of involvement, such as noticing and paying conscious attention to form-meaning relations. These three components are taken into consideration while designing *vocabulary* games. Second, Long's (1981) *Interaction Hypothesis* suggests designing interactive and communicative language experiences for learners. For example, games based on interaction and communication for meaning contribute to *vocabulary* learning. Swain's (2000) *notion of collaborative dialog* can be used in collaborative *vocabulary* games like role-plays to reinforce and practice *vocabulary*. It helps students actively use and apply the target *vocabulary* they learn in the lesson. Furthermore, Verga & Kotz's (2017) *analysis of interactions* as an attentional device and studies on competitions state that interaction, collaboration, and competition elements pave the way for successful learning. The best kind of *comprehensible input* is interactionally *modified input*, which entails speakers' active involvement and collaboration (Ortega, 2013). Apart from interaction, competition and challenge are also key components of *vocabulary* games (Prensky, 2007). They are critical to empowering non-game activities and contributing to *vocabulary* learning (Deterding et al., 2011). Next, in the *Zone of Proximal Development*, Vygotsky underlines the significance of challenging learners at a level just beyond their current capabilities (Vygotsky, 1980). *Gamification* can be organized to gradually enhance the difficulty levels, keeping learners in their *ZPD* to enhance their *vocabulary* capacities. In addition, *scaffolding* is another term used to describe the support provided by a knower to be

arranged according to students' knowledge and needs. Social interaction, depending on *scaffolding*, is accomplished during games and highly contributes to vocabulary learning. Last, another theory related to the gamification of vocabulary is the *Flow Theory*. *Flow* refers to an average cognitive state that learners experience while they completely concentrate on an activity and are fully engaged in a task, which causes permanent learning and significant levels of pleasure and thus fosters successful learning outputs in terms of *vocabulary* learning (Csikszentmihalyi & Davis, 1975). When in a condition of *flow*, learners might lose track of time, feeling that time passes faster than usual. The balance between the challenge level of the activity and the learner's current ability, clear aims, concentration, and immediate feedback given to learners are all significant in this theory.

2.1.3. Artificial Intelligence

The term *AI* has to be clarified since various definitions have been proposed for *AI* in the EFL context. First, it is defined as a special area of curiosity and progress rather than a kind of intelligence that is artificial itself (Holmes & Tuomi, 2022). It is a computer-oriented technology imitating and utilizing the human mind, its useful features, and its powerful sides (Sindermann et al., 2021). Second, according to Rukiati et al. (2023), *AI* usually means the improvement of computer technology systems that can carry out duties that would normally include intelligence that belongs to humans, such as comprehension of language models, understanding natural language processes, systematic and efficient decision mechanisms, and suggesting reasonable solutions to experienced problems in real life contexts. Third, according to Mehrotra (2019), *AI* is a branch of information technology and computer science that concentrates on analyzing and creating smart applications and

software that can be used to support the language learning field. *AI* is also defined as data processing systems that are intelligent like humans and use data to execute human-like tasks like teaching, learning, correcting, assessing, giving immediate feedback, and solving complicated problems (Popenici & Kerr, 2017). Moreover, it is defined as a trendy technological field efficient in changing any component of people's social routines and improving the quality of interaction between interlocutors (Arini et al., 2022). It is also defined as a digital attempt to imitate human intelligence using different algorithms and computations (Kaur & Gill, 2019). To sum up, it can be defined as a field of programming machines to think and operate like human beings and supporting language learning with a variety of tools specifically designed to make the language learning process simpler, easier, and more practical for EFL learners.

AI is frequently used to support main language skills, pronunciation, and grammar areas in the EFL context. First, to aid in intelligibility, proficiency, and willingness to interact with other interlocutors in speaking and listening practices, intelligent personal assistants are preferred (Howard et al., 2023). For example, *AI Chatbots* benefiting from *NLP* and *text or text-to-speech* functions to encourage intelligent human language communication in speaking practices may contribute to fluency by enhancing and strengthening learners' knowledge of oral skills (Haristiani, 2019). *Neural network-based dialogue systems* are also utilized to support free speaking activities and assess the speaking performance of EFL learners (Suendermann-Oeft et al., 2017). Second, to support writing skills, *AI* is used to translate texts, create free-writing products, write dialogues or role-plays, give feedback, and help learners correct their errors throughout the writing process (Woo & Choi, 2021). To illustrate,

NMT tools such as Google Translate and Bing construct a single neural network to boost translation achievement and eliminate problems and weaknesses related to traditional phrase-based translation applications (Vanjani & Aiken, 2020). In addition, *AESs* benefit from *NLP* and big collections of data to help assess the input and supply automatic revision choices for EFL learners to correct their errors (Jiang, 2022). Third, intelligent *ML* systems detect learners' reading difficulties and problems to improve reading skills. They offer solutions for these problems and determine pedagogical components to differentiate between high-achievers and low-achievers in reading skills (Xiao & Hu, 2019a). To exemplify, *ITSs* ease learning by taking advantage of learner models, neural networks, algorithms, and feedback mechanisms to support learners' problems related to reading (Jiang, 2022). Furthermore, *AI* can be used to support pronunciation problems experienced by EFL learners. A multimodal system having speech functions and individualized voice models has been used in the EFL context to support pronunciation (Liu et al., 2020). In addition to multimodal systems, *AC* that has an effect on affective issues or emotions by recognizing users' affective states like speaking anxiety from their physiology, facial expressions, and textual data may help learners overcome their problems related to pronunciation (Picard, 1997). Last, *AI* also helps solve learners' grammatical problems. To guess grammatical difficulties that students may have stemming from their first language transfer and help learners learn from their grammatical errors, educational games, mobile applications, immersive environments, and *NN* models can be utilized by EFL learners (Kartal, 2019). To illustrate, *VR* tools may support the *CLIL* approach in ELT, and learners can learn both grammar and content in virtual environments via these intelligent tools (Jiang,

2022). *ChatGPT* can help learners generate sentences using a specific grammar subject to provide them with examples of the grammar in context. In conclusion, *AI* support seems necessary in the field of language learning now and in the near future.

AI tools used in *vocabulary* areas may help learners solve the problems and challenges they experience while learning *vocabulary*. First, *AI chatbots* may empower students' mastery of new *vocabulary* (Wang & Petrina, 2013). To illustrate, learners can use *ChatGPT* to write a story using *vocabulary* that they want to learn or review. *AI chatbots* may also help improve learners' lexical knowledge (Doherty & Kenny, 2014). According to Fryer et al. (2019), *chatbots* include large lexicon, dictionaries, visuals, translation options, and concordance tools, which may make them perfect tools for *vocabulary* learning. Second, *VR* tools in the EFL context may support *vocabulary* learning and retention of words (Lai & Chen, 2023). They provide contextual learning opportunities for learners to aid in learning *vocabulary* (Chen, 2016). Their multimedia features may help students visualize, comprehend, and shape their *vocabulary-related* knowledge (Lan, 2016). Finally, students can benefit from *MT* tools like *Google Translate* to improve their *vocabulary*. Through utilizing *MTs* as learning tools, learners may find and correct their errors related to *vocabulary* choice in a piece of writing they produce by comparing their production with the one that has been translated by *MTs*. Learners thus may gain greater insight into comprehending the language while improving and enhancing their *vocabulary* knowledge at the same time (Kasepalu et al., 2022). In summary, *AI* tools may be supportive of EFL learners while learning *vocabulary*. *AI* tools are also used in *the gamification of vocabulary* in addition to *vocabulary* areas.

AI integrated into *gamification* in the EFL context may empower the learning process and enable learners' time efficiency and management in terms of learning *vocabulary*. First, *AI-based games* can measure learners' proficiency levels and adjust difficulty levels according to each individual's learning path and individual needs for *vocabulary* (Murtaza et al., 2022). Second, real-time feedback given by *AI-based games* may help students correct their errors and strengthen correct answers on time, which also contributes to formative assessment of *vocabulary* learning (Hovsepyan, 2022). Last, *AI chatbots* may engage students in short conversations, quiz-like games, or challenges that require the use of new-learned words, which may help authentic language use and retention of *vocabulary* (Na-Young, 2020). In conclusion, *gamification of vocabulary* based on *AI* may be helpful for EFL learners.

Several theories and hypotheses may be related to *AI*. First, *AI-based chatbots* or *dialogue systems* may benefit from *the Interactional Competence Theory* of Young (2011) (Roever & Kasper, 2018). The theory suggests the significance of communication skills that EFL learners are expected to practice and learn. It requires improving communication abilities and using linguistic and interactional sources, such as turn-taking strategies and task-induced management within a particular context (Galaczi & Taylor, 2018). *Interactional competence* includes mutual communication that can be cooperative and asymmetric, constructed by speakers in dialogues resulting from *sociolinguistic-interactional* and *psycholinguistic-individualist* points of view (Roever & Kasper, 2018). Second, *the Adult Learning Theory* by Knowles (1980), in other words, *the Andragogy Theory* defines andragogy as empowering and supporting adults' learning. In this theory, in contrast to young learners, adult learners are viewed as autonomous, self-directed, and goal-oriented.

These learners take responsibility for learning and achieving success. To make this approach more efficient, it is necessary to set up respectful, collaborative, trustworthy, supportive, authentic, enjoyable, and humane relationships between the teacher and learner (Pratt, 1993). These individualized learning needs and learner-centredness qualities of the theory may support *AI* use for creating personalized learning opportunities for EFL learners. Next, *Social Constructivism*, led by Vygotsky (1980), may support the use of *AI* due to the similarity between *chatbots* and the social surroundings of the learner. The theory suggests the internalization of knowledge during social interactions. According to Clark (2018), *chatbots* facilitate learning during social interactions, as they are intentionally prepared to replicate intelligent human language communication and give feedback to learners. Benefiting from this function of *chatbots* may support and contribute to effective learning in the EFL context. After that, the *Activity Theory* put forward by Vygotsky and his colleague Leontiev (1978) suggests that there are three main steps to be followed while learning a language (Wertsch, 1985). The first one is called ‘*activity*’ which refers to human actions in general terms and is related to motivation without which no activity is possible to be performed by subjects or learners. The second step includes ‘*action and goal*’. It is defined as a mechanism of human functions that aims to achieve a conscious and purposeful goal (Wertsch, 1979). The third one involves ‘*operations*’ and ‘*conditions*’ under which an action is performed. *Operations* are triggered by the contextual circumstances of the task unconsciously and performed in social contexts such as *Task-Based Language Teaching*, *Collaborative Learning*, and *Project-Based Learning*. Similar actions can be taken to perform different activities when the object and motive are not similar (McCafferty

et al., 2001). To illustrate, playing a game can be motivated by the wish to have a competitive atmosphere or to spend time socially with friends, and the results can be different: winning, losing, or just playing the game (Roebuck, 1998). Combining *AI* tools with *Activity Theory* principles may support language learning, enhancing opportunities to take advantage of individualized, technology-integrated activities within a social and contextually rich atmosphere. Last, *Connectionism*, coined by Thorndike (1930), views language as a mechanism of reciprocal action between input and output in neural structure (Binh & Chau, 2023). Grounded by *Connectionism*, *AI* benefits from *artificial neural networks (ANNs)*, a subcategory of *AI* that utilizes computer models that simulate the construction of biological neurons. *ANNs* can be utilized to form *ASR* systems that can give learners prompts, feedback, linguistic input, and output, exercises, or drills to aid their pronunciation, speech, and vocabulary, and assess learner performances while playing games (Tokowicz & MacWhinney, 2005).

2.2. Literature Review

This section first reviews the popular research topics on vocabulary in the EFL context. Then, research on technology and vocabulary in the EFL context is examined. Next, research findings on gamification and vocabulary in the EFL context are summarized. Finally, research on AI-enhanced gamification for vocabulary learning in EFL learning is presented.

2.2.1. Research on Vocabulary

Current research shows that research on vocabulary mainly focuses on vocabulary learning strategies for retention, the role of affective factors on vocabulary learning,

individual differences in vocabulary learning, assessment of vocabulary knowledge, and incidental vocabulary learning in the EFL context. In the current literature, there has been a large number of studies carried out on vocabulary learning strategies for retention (Kiasi & Gilakjani, 2023; Huang, 2023; Hill, 2022; Shamsan et al., 2021; Goundar, 2019; Al-Khresheh & Al-Ruwaili, 2020; Elekaei, 2019; Al-Malki, 2022; Bahrami et al., 2022; Thao, 2022; Feng et al., 2023), the role of affective factors on vocabulary learning (Yıldız, 2023; Borschovetska et al., 2022; Katsarou & Kambakis-Vougiouklis, 2022; Mahvish et al., 2023), the individual differences in vocabulary learning (Tursunova, 2022; Shin et al., 2023; Aysu, 2022; Tanaka, 2022; Tang & Lim, 2023), assessment of vocabulary knowledge (Nourdad & Banagozar, 2022; Ritonga et al., 2022; Rezai et al., 2022; Hammad Al-Rashidi et al., 2023; Tashmuradova et al., 2023), and incidental vocabulary learning (Bilgin & Bingöl, 2022; Qasim, 2021; Hendra, 2018; Zou & Yan, 2019; Alsaif & Masrai, 2019; Sze-to & Jung, 2022; Calvo-Ferrer & Belda-Medina, 2021; Ashcroft et al., 2018; Hsu, 2018).

2.2.2. Research on Vocabulary and Technology

Research indicates that vocabulary learning is considerably affected by digital technologies, web 2.0 tools, and social media applications. As an example, given that studies mainly focused on the relationship between the use of digital technologies and vocabulary learning, Castillo and Quinonez (2022) aimed to show the effect of using digital comics to empower EFL vocabulary capacity by implementing quasi-experimental research. The data of this study were collected by pre-tests, post-tests, and a perception survey from 262 public high school students from three of the four regions of Ecuador. They concluded that digital comics significantly contributed to the improvement of vocabulary learning in the experimental group. This group also

showed a positive perception of using digital comics to boost EFL vocabulary capacity since comics allowed them to form unique digital stories and adapt them according to their preferences. In another study, Yowaboot and Sukying (2022) tried to find out whether the use of digital flashcards could support English vocabulary knowledge of the form-meaning relationship in Thai primary school students in the EFL context. The data of this quasi-experimental study were collected by vocabulary checklists, post-tests, and questionnaires from 120 students. As a result, the researchers found that the students in the experimental group performed significantly better than the control group. The results showed that digital flashcards were effective in supporting vocabulary learning by benefiting from audio and visual components in digital platforms. The analysis of the questionnaires also demonstrated that students had a very positive attitude towards the use of digital flashcards in the classroom. Another study by Tatlı et al. (2022) aimed to explore the effect of digital stories in an online lesson on vocabulary achievement. The participants consisted of 33 Turkish EFL students studying at the tertiary level who took part in an online English course and 21 volunteers who took part in interviews. The data of this mixed-design study were collected by pre- and post-vocabulary tests, speaking evaluation rubrics, and cognitive load scales. The findings revealed increased vocabulary achievement after DS use. The results gained from the qualitative data also showed positive evaluations of the effect of DS on vocabulary use. In another study, Merzifonluoglu and Takkac Tulgar (2022) examined whether digital technologies had a positive effect on vocabulary improvement by increasing students' awareness of utilizing technology for educational purposes. In this quasi-experimental study, the data were collected by creative writing assignments and an

achievement test. The participants were 48 prep-class students. The researchers concluded that the learners in the experimental group outperformed those in the control group and gained new vocabulary. Research shows that using Web 2.0 tools in the classroom affects vocabulary learning. To illustrate, Sanosi (2018) aimed to investigate the link between the impact of Quizlet, a web 2.0 vocabulary learning tool, and vocabulary learning. The research was implemented by pre-tests and post-tests undergone by control and experimental groups consisting of 42 low-level EFL students at a university in Saudi Arabia. The findings showed that within a month after the implementation of the Quizlet application, the experimental group gained a significant achievement in post-tests. In another study, Yeşil (2022) investigated the effects of Smart Draw, a Web 2.0 tool, on vocabulary retention by comparing traditional paper-based methods and web-based methods. A total of 28 learners from a state university in Türkiye took part in this experimental research. A word-familiarity test was implemented before and after the treatment. The results showed a remarkable development over time for the experimental group in terms of vocabulary recognition and retention compared to the control group. In their quasi-experimental study with pre-test and post-test control groups, Babacan and Güler (2022) examined the effect of using Plickers, a web 2.0 tool used in assessment and evaluation, on vocabulary achievement. Sixty-one learners studying in the ninth grade of a high school in Türkiye participated in the study. The results indicated that the experimental group's English vocabulary achievement improved significantly compared to the control group. A study conducted by Rahayu and Bhaskoro (2022) aimed to describe the use of Edpuzzle in the vocabulary area. In this quantitative descriptive study, the participants were thirty-three 8th-grade students. The results

indicated that using Edpuzzle in learning vocabulary enabled students to be more active and the class to be more enjoyable. It also helped them understand the text and memorize words during learning. Research also demonstrates that benefiting from social media platforms is also one of the factors affecting vocabulary skills. Putri (2022) aimed to find whether the use of Instagram can boost learners' vocabulary or not. The researcher collected data from the writing class PI 17 A and took a sample of 28 students out of 47 students to support his descriptive qualitative study. The results showed that the use of social media, especially Instagram, is an effective learning tool for learning vocabulary and increasing vocabulary capacity through captions and videos. In a similar study, Pham et al. (2023) aimed to discover learners' opinions and feelings about using social media for English vocabulary improvement. A mixed method was implemented with surveys for 154 participants in different majors at a university and semi-structured interviews for 15. After the implementation process, research showed learners' deep insights into utilizing social media to enhance their vocabulary skills and its positive contributions to learning vocabulary. In another study, Evafaliyanti and Usmawita (2019) aimed to determine the impact of Mr. Dhanis's video on Instagram on learners' vocabulary mastery. The research used quantitative and experimental methods together. The participants included 142 learners at the eleventh grade, and 62 of them were taken as samples of the study. Pre-test and post-test were used as instruments. The results demonstrated that teaching vocabulary benefiting from Mr. Dhanis's video on social media affects the increase in vocabulary mastery by indicating a significant difference in English vocabulary mastery. Another study by Alghameeti (2022) aimed to search the perceptions of Saudi middle school students towards benefiting from TikTok videos

in English vocabulary learning and their contribution to the expansion of vocabulary. The study used a quantitative method and collected data from a survey questionnaire. The participants of the study were 50 middle school learners. The results concluded that learners have positive thoughts and approaches towards utilizing TikTok videos in the vocabulary learning process. Furthermore, the participants noted that this social media tool offers them a variety of options and alternatives which aid in the expansion of their English vocabulary. In another study, Al-Khazaali et al. (2023) aimed to find whether using Facebook affects learners' performance in vocabulary improvement. To carry out the research with an experimental group, the researcher created a group on Facebook called Vocab-Developer, which consisted of educational videos, audio, drills, and educational materials. A mixed-method was carried out including a pre-test-post-test design and a questionnaire. After the implementation, the results showed that the students in the experimental group had better vocabulary improvement compared to the control group who were exposed to the traditional teaching method.

2.2.3. Research on Vocabulary and Gamification

A great deal of research on the use of gamification in EFL vocabulary demonstrates that it is useful and has positive effects on learning vocabulary. In their study, Ahmed et al. (2022) aimed to examine the impacts of gamification on improving students' idiomatic knowledge. Fifty participants took part in this experimental study. To collect the data, the idiom pretest and post-test were administered. The research findings showed that the experimental group taught the new idioms using game-based instruction performed better than the control group receiving traditional idiom instruction. Gamification helped EFL students develop

their idiomatic knowledge. The findings demonstrated that students showed positive manners toward gamification in learning English idioms. Lam (2014) conducted a case study to examine the effect of Web 2.0 games to aid learners in gaining vocabulary. Five groups of learners aged between 18 and 20 from different faculties of a university took part in the research. The learners learned and reviewed words through two online games. An online survey was used to learn students' views and attitudes towards using online games in learning words and their impact. The results indicated that gamification of vocabulary facilitated vocabulary retention, enhanced vocabulary learning, and improved learners' attitudes towards learning vocabulary. In their study, Thiagarajah et al. (2022) aimed to examine learners' opinions about the efficacy of gamification tools to improve vocabulary skills. The study was both quantitative and qualitative with the participation of 60 learners. The data was collected via questionnaires. The results reported that Kahoot! is proven to be beneficial and influential for vocabulary learning. A quasi-experimental study by Saleh and Althaqafi (2022) aimed to investigate the impact of using educational games on the vocabulary learning of kindergarten students. The participants were 40 Arab young learners between 5 and 6 years old. The experimental group was taught using games, and the control group was taught using repetition, a traditional method. Pre-test, post-test, and delayed test were applied to both groups. The study showed that using games improved vocabulary retention, and learner engagement and suggested benefiting from games in teaching vocabulary more creatively with young students. In another study, Panmei and Waluyo (2023) aimed to examine the impacts of gamified vocabulary learning utilizing an application, 'Quizizz'. This quasi-experimental study consisted of 100 first-year undergraduate students at a university

in Thailand. The experimental group had gamified learning intervention of vocabulary, but the control group did not. The data were gathered using survey questionnaires, vocabulary tests, and students' weekly Quizizz practice scores. The results showed that learners' views of the implementation remained high and positive. The findings also supported the integration of gamification into vocabulary learning.

2.2.3.4 Research on AI-enhanced gamification and language skills

Current research on AI-enhanced gamification mainly focuses on basic language skills and pronunciation in the EFL context. Research results indicate a positive correlation between using these applications and improving language skills rather than the relationships between AI-enhanced gamification and learning. For example, Manuhutu et al. (2020) aimed to examine correlations between the game-based platform Novo learning and English language skills in non-English learners. Thirty-three participants took part in the study. Data was obtained by a questionnaire. Findings indicated that there is a positive correlation between the game-based learning platform and English language skills. In another study, Arini et al. (2022) investigated the improvement of EFL university learners who studied English using artificial intelligence and a game-based platform. One thousand university students took part in the study. Tests and interviews were used to collect data in this experimental study. The findings demonstrated that the experimental group who used AI-supported mobile game-based learning was significantly greater than the control group in the areas of pronunciation, speaking competence, and communication. Sutami (2021) aimed to describe how to implement AI and game-based ORAI mobile applications to learn to speak. The data were collected by analyzing articles,

journals, and papers. The findings indicated that the application effectively improves speaking skills and pronunciation. The study conducted by Yuliani et al. (2023) aimed to determine how the AI-supported program Rosetta Stone in English classrooms impacted learners' pronunciation skills. The study used a quasi-experimental pre-test-post-test design with 30 participants divided into experimental and control groups. The results showed that the application significantly and positively impacted the experimental group's pronunciation. In another study, Syafrizal and Septiawati (2022) aimed to improve learners' listening skills and understand how they utilize AI and the game-based platform Busuu to learn English. Twenty-five learners at a university in Indonesia participated in this quasi-experimental research. A multiple-choice test and pre-test-post-test were used to collect data from the participants. The findings revealed that the participants' performance increased significantly after the treatment. Alfuhaid (2021) investigated the impact of using Duolingo in EFL classes to improve the learners' speaking proficiency. Twenty-eight male secondary school students took part in the study. In this experimental research, the data were collected by a post-test. After analyzing the findings, it was concluded that the use of the Duolingo application positively improved the learners' overall language skills and speaking proficiency.

2.2.3.5 Research on AI-enhanced gamification for vocabulary learning

Since the research on AI-enhanced gamification has generally been made on EFL language skills together with pronunciation, and there is no direct study on AI-enhanced gamification on vocabulary learning, this section presents indirect research results from journal articles. Current research on AI-enhanced gamification for vocabulary learning in the EFL context shows a positive correlation between using

AI-based and gamified platforms and vocabulary learning. Irzawati (2023) aimed to present an overview of the positive impacts of integrating Duolingo into EFL learning. The researcher analyzed the impact of using the application through a review of journal articles. The findings demonstrated that integrating this application into EFL learning had favorable contributions to achieving higher levels of mastery of vocabulary. In a similar study, Kusumadewi and Widyastuti (2018) aimed to discover the impacts of Duolingo on learners' vocabulary enhancement. The research used an experimental design. The results indicated a positive effect on the mastery of English vocabulary between learners who benefited from the application. In another study, Esmaeili and Shahrokhi (2020) explored the impact of the Memrise application on Iranian EFL students' collocation learning and vocabulary retention. The researchers used a quasi-experimental design with 75 students studying at a private language institute. The findings revealed that the application had a statistically differential impact on collocation learning. Moreover, there was a significant difference between the experimental group using the application and the control group receiving traditional teaching. In a similar study, Nasution (2022) aimed to find out the effect of Memrise application on vocabulary mastery of seventh-grade junior high school learners. In this quantitative study with a quasi-experimental design, 64 students took part. To collect data, a multiple-choice test was used as a pretest and post-test. The results showed that the application significantly impacts vocabulary enhancement and mastery. The study carried out by Prasetyo et al. (2018) aimed to identify the impact of the Rosetta Stone application on learners' vocabulary mastery. Both qualitative and quantitative methods were used in this Classroom Action Research. Sixteen boys and fourteen girls from 8th

grade at a junior high school joined the study. The study's results demonstrated that the participants could memorize the new words more easily, pronounce most of them accurately, and seldom make mistakes in their sentences. They improved their vocabulary mastery significantly after using the application.

2.2.3.6 Conclusion

In conclusion, the literature review provides a comprehensive overview of research on vocabulary learning in the EFL context, with a specific focus on the intersection of technology, gamification, and AI. The review part is organized into five main sections: research on vocabulary, research on vocabulary and technology, research on vocabulary and gamification, research on AI-enhanced gamification and language skills, and research on AI-enhanced gamification for vocabulary learning. The first section delves into various aspects of vocabulary research, emphasizing strategies for retention, affective factors, individual differences, assessment, and incidental learning. Numerous studies are cited, demonstrating a rich body of research in these areas. The second section explores the impact of technology on vocabulary learning. Digital technologies, web 2.0 tools, and social media applications are discussed in detail. Studies highlight the positive effects of utilizing digital tools such as digital comics, flashcards, digital stories, and web 2.0 applications like Quizlet, Smart Draw, and Plickers. Social media platforms, including Instagram and TikTok, also emerge as effective tools for enhancing vocabulary skills. The third section focuses on gamification and its positive effects on EFL vocabulary learning. Studies indicate that gamified approaches, using platforms like Kahoot! and Quizizz, improve vocabulary retention, learner engagement, and positive attitudes toward vocabulary learning. The last sections

delve into the emerging field of AI-enhanced gamification, particularly in the context of language skills. Research demonstrates the positive correlation between AI-supported applications and language skills, including pronunciation, speaking competence, listening skills, and overall language proficiency. While direct studies on AI-enhanced gamification for vocabulary learning are limited, indirect evidence from various studies suggests a positive impact on vocabulary enhancement. In summary, the literature review underscores the dynamic nature of vocabulary research in the EFL context, showcasing the evolving role of technology, gamification, and AI. The integration of these elements is depicted as a promising avenue for enhancing vocabulary acquisition and language skills. The findings from various studies collectively contribute to a nuanced understanding of effective approaches to vocabulary learning in the EFL context, paving the way for future research and pedagogical revolutions in language education.

3. METHODOLOGY

This section presents the methodology and procedures of the study. First, the research design is introduced. Second, participants in the study are described. Then, data collection procedures and tools are introduced. After that, research procedures are presented. Finally, data analysis is introduced.

3.1. Research Design

The main focus of this research is to explore how AI-enhanced gamification impacts EFL vocabulary learning. The approach is analytical, breaking down the data into smaller components and establishing connections to provide a cohesive understanding within the context of the existing vocabulary area. Moreover, the study takes a deductive approach, posing the question of whether AI-enhanced gamification effectively contributes to learning vocabulary, building on the recognized advantages of AI and gamification use in the EFL context. Furthermore, AI-based gamification serves as the independent variable of the study, and vocabulary learning as the dependent variable. Employing a quasi-experimental research design, the study does not randomly assign participants to groups but selects preexisting groups like classes for both experimental and control groups (Creswell, 2014). Both groups undergo pre-tests and post-tests, with the experimental group receiving special treatment while the control group serves as a baseline for comparison (Seliger & Shohamy, 1989).

3.2. Participants

Thirty-two students at the public secondary school in Yalova, Türkiye, took part in the research. They were beginner-level EFL learners, corresponding to A1 based

on The Common European Framework of Reference for Languages (CEFR). Fifteen participants were females (47%), while 17 were males (53%). The ages of the participants were 11, and the mean score for age was 11. The participants were all non-native English speakers, and their L1 is Turkish. As for the participants' grades at the school, they were all in the 5th grade. They have 11 hours of English classes in one week. The students followed international coursebooks chosen by their teachers, including all language skills, grammar, and vocabulary, in addition to the compulsory course book of the MONE.

Furthermore, a focus group study was needed to discover and examine the possible causes of the results obtained after the analysis of the findings. Five participants from each group were randomly chosen and a 40-minute meeting was conducted separately. The average for the ages of students was 10. Of the students, 5 (50%) were male, while 5 (50%) were female.

3.3. Tools

Two tools were used in the study: a background questionnaire and a vocabulary test. Also, a focus group interview was conducted including five participants from each group. First, the background questionnaire which includes demographic information such as age, gender, grade, and current English proficiency levels was implemented. Second, a vocabulary test developed by Tapia (2021) was implemented. (See Appendix A). The reason for choosing this tool was that it was valid, reliable, and applicable for A1 level learners. Cronbach's Alpha was utilized to assess the reliability and the internal consistency of the set of items in the vocabulary test. The findings for Cronbach Alpha indicated a coefficient of 0.75 which meant that the vocabulary test possessed an acceptable internal consistency. In terms of the

validity of the tool, the technique adopted was highly effective to be used in the data collection procedure. The validity of this vocabulary test was supported by the critical evaluation and experience of three language instructors from distinct universities who dedicated a lot of comprehensive work, review, and assistance in the validation of the test to confirm its validity. The tool of validation included three subcategories. The first one was A and it examined the agreement of the test items with the goals, variables, and statistical indicators. The letter A represents appropriateness and NA represents inappropriateness of the item. The other subcategory is B examining the technical qualifications and representativeness of the items. The expressions for this variable were shown with different letters, such as I for ideal qualities, G for good qualities, letter R for regular qualities, and letter P for poorness. At last, the subcategory C was related to language use and grammar properties. Accordingly, letter A represents accuracy, and letter I represents inappropriateness. Finally, the validation intended to decide whether the test was practical and objective to be utilized with secondary school learners. The results of the validation of the test can be seen in Table 1. The tool was used as a pre-test to assess the present level of vocabulary at A1 and as a post-test to assess the advancement after the experiment. The test included three parts: Parts A, B, and C. There were 30 questions to test receptive vocabulary in part A, and students put a tick on the correct choice. There were 10 questions in part B to assess receptive vocabulary by selecting from multiple choices. Part C contained 20 open-ended questions to test productive vocabulary by benefiting from the given clues or definitions and writing the letters of missing words. The organization of the vocabulary test can be seen in Table 2. The total score was 60 points, and the mean

score was used to gain an average above 10. The sum of the score was calculated through a standardized measurement instrument, which is 10 out of 10. The findings from the pre-tests and post-tests were examined using the paired two sample for means statistical data analysis program. The analysis of pre-test results revealed 6.41 out of 10 and the standard deviation was 1.08 for the experimental group. The post-test results, on the other hand, revealed 8.07 out of 10 and the standard deviation was 0.56. Pre-test and post-test scores were compared with a qualitative scale based on excellent, very satisfactory, little satisfactory, and not satisfactory descriptors which corresponded with general test performance. Afterwards, the pre-test mean was between 6 and 6.99 which was interpreted as little satisfactory. The post-test mean was between 8 and 9.99 which was highly satisfactory. (Tapia, 2021).

Finally, a focus group study was conducted with 10 participants for a focus group study, including five participants from the control group and five participants from the experimental group. To ensure that the opinions received were original and free, each group was interviewed separately, and it lasted nearly 20 minutes for each group. Five questions were prepared on gamification, AI-enhanced gamification, and vocabulary learning to investigate and examine the views of the participants. In this face-to-face focus group interview, the participants' answers were recorded by the researcher. All personal information of the participants was hidden and used anonymously in the study. To understand the results further and the reasons behind the differences in vocabulary retention, a focus group was held.

Table 1**Validation of Vocabulary Test**

Categories Items	(A) Correspondence with the objectives, variables and indicators. A: Appropriate NA: Not appropriate		(B) Technical Quality and representativity I: Ideal G: Good R: Regular P: Poor				(C) Language and grammar. A: Accurate I: Inaccurate		Observations
	A	NA	I	G	R	P	A	I	
A. Read the statements and put a tick on the answer you think is right.	3		3				3		
B. Look at the words in bold and choose a, b, or c.	3		3				3		
C. Look at the definitions and use the letters to write words.	3		3				3		

Table 2**The Organization of the Vocabulary Test**

Part	Description	Number of Questions	Type of Testing	Method
A	Passive Vocabulary	30	Receptive Vocabulary	Tick on an answer
B	Passive Vocabulary	10	Receptive Vocabulary	Choose A, B, or C
C	Productive Vocabulary	20	Productive Vocabulary	Reading and Writing

3.4. Procedure

After obtaining approval from the ethical committee granted by the Faculty of Educational Sciences at İstanbul Medeniyet University (See Appendix B), the school administration of the public secondary school where the study was to be

implemented was informed to obtain permission. Afterward, the participants were informed about the aim, benefits, and weekly procedures of the study. It was also mentioned that the research was voluntary and anonymous. In addition, the participants were assured that the research was confidential, and the data to be collected would only be used for scientific and academic purposes. To obtain the consent of the participants, an approval form was attached to the vocabulary test.

The study was conducted in the Spring Semester of 2023-2024. First, two pre-existing classes were chosen for the research, and they were randomly assigned as the control and experimental groups. After that, both groups took the vocabulary test as a pre-test. Then, they practiced learning vocabulary under different conditions and settings. The control group used games to practice vocabulary, while the experimental group additionally completed tasks with AI support. ChatGPT was chosen as the AI tool. Finally, after a 5-week study, both groups took the post-test. After the post-tests, a focus group interview including five questions was carried out with ten participants, involving five participants from each group. The interview was held face-to-face and lasted for 40 minutes in total. The whole procedure can be seen in Figure 1.

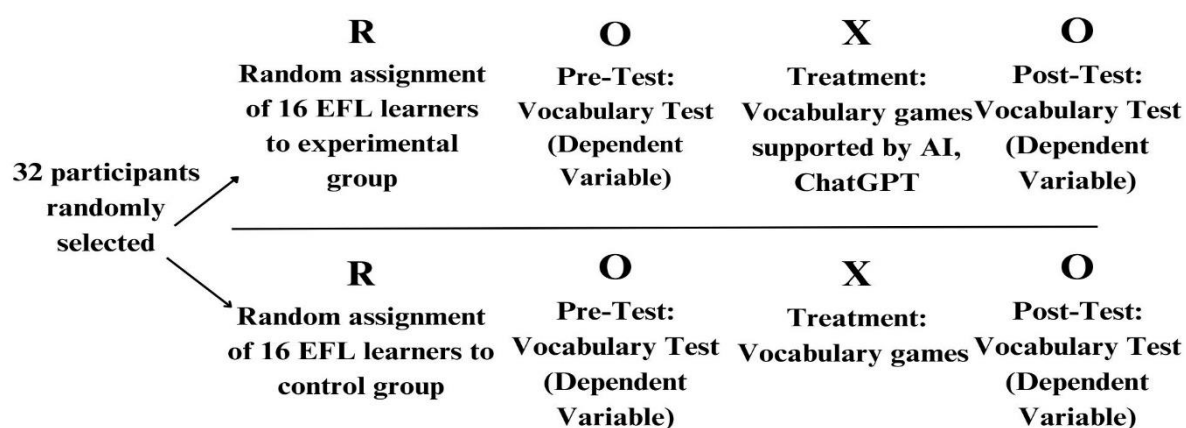


Figure 1

The flowchart of the randomized pre-test-post-test control and experimental design (Fraenkel et al., 2012)

3.4.1. Pre-test Implementation

Before the implementation, the participants were informed about how to complete the vocabulary test. Then, the vocabulary test was administered, and the participants were expected to respond to 60 items examining their vocabulary knowledge. They were instructed to choose the best answer and fill in the blanks at their own pace, which took 40 minutes. The vocabulary test was given in English as in the original study since the participants were competent enough to fully understand each explanation and answer appropriately. However, L1 translations were provided to the participants to prevent any misconceptions or hesitation where necessary.

3.4.2. The Practice Process

The practice process lasted for five weeks during which the participants received instructions and learned new vocabulary through flashcards, story cards or cubes,

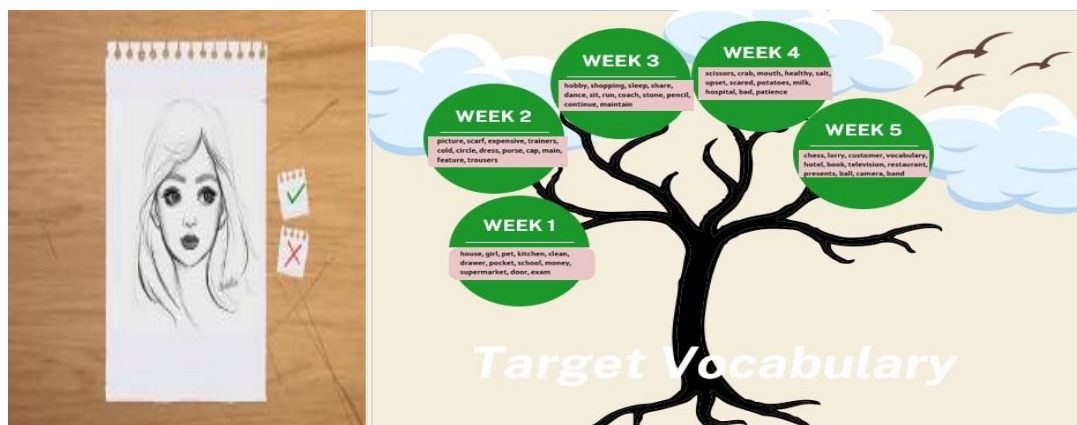
taboo game cards, digital or non-digital classroom games, and AI. The target words were chosen from the CEFR A1 level vocabulary test by Tapia (2021). The words were categorized under different themes, and each week 12 target words were taught. During the process, the participants were encouraged to use the words they had learned in sentences and personalize their experiences. Both groups were exposed to the same instructions, activities, and educational materials during the practice process. Biased remarks and questions were avoided to prevent any potential effects.

Week One

During the first week of practice, the instructor introduced the target 12 words through flashcards prepared on the website called Wordwall. L2 definitions, synonyms or antonyms, and visuals were utilized to support comprehension of the words. Then, the students were introduced to new terms such as synonyms, antonyms, parts of speech, and collocations, and examples were presented. Then, the participants in the experimental group were given prompt cards to find the synonyms, antonyms, collocations, and parts of speech of the target words using the ChatGPT AI tool on the board. They took notes and expanded their knowledge. Next, a digital board game created on the website called Learn Hip was played. The class was divided into two groups, with each group member selecting their player and placing them on the starting position of the board. The rules were explained, and students took turns rolling a dice and moving along the board. If a student used or predicted the word correctly, they rolled the dice again and continued their turn. If they failed to answer, their turn ended, and the play moved to the next group. The game continued until a group reached the finish line. After the game, students shared

their favorite words and used them in sentences. Game activities' links, weekly target vocabulary, and ChatGPT prompt cards can be seen in Figure 2.

Week 1 HOME and Daily Life Flashcards (wordwall.net) and Weekly Target Words



Week 1 House and Daily Life Board Game (learnhip.com) & ChatGPT Prompt Cards

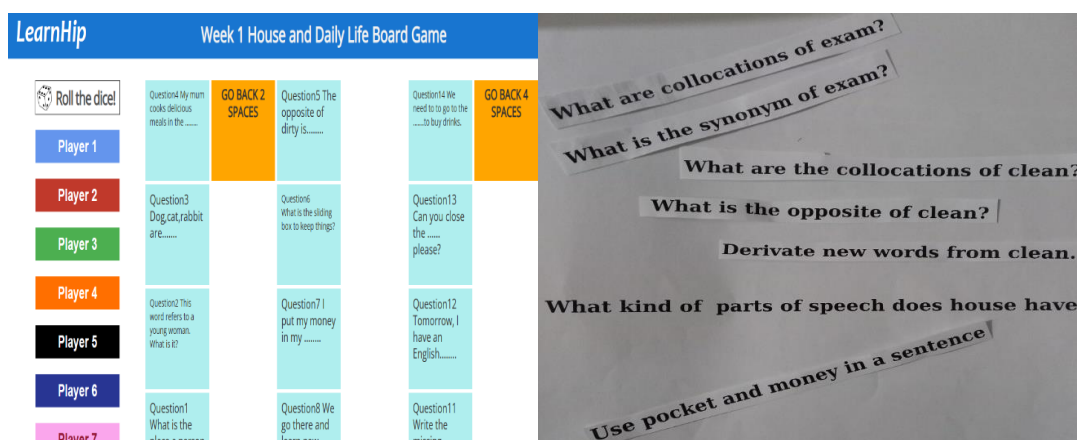


Figure 2

Wordwall flash cards, weekly target vocabulary, Learn Hip Digital Word Game links, and ChatGPT prompt cards.

Week Two

During the second week, 12 target vocabulary words were taught using contextual clues, such as cause and effect, time, setting relationships, and comparisons in a text as clues to the meaning of words or phrases. To create a story, the AI tool ChatGPT

was used, and the target vocabulary was given in bold letters to make them easily noticeable to students. The instructor wrote *context* on the board and asked students if they were familiar with the terms. After that, brief explanations and clear examples were provided. Then, students tried to predict the meaning of bold words in a story, and the instructor guided them on how to define meanings and benefit from contextual clues. Later, the participants engaged in a discussion about how context can help them understand the meaning of unknown words while reading. Next, the instructor started another activity. The experimental group was divided into two groups and distributed a set of vocabulary cards. One group was asked to create a funny story on the smartboard, and the other group was asked to create a sad story by typing their vocabulary into ChatGPT. After the AI created a unique story, the participants read aloud their stories and shared them with their group members. They were instructed to reinforce newly learned words by giving prompts to ChatGPT to create unforgettable contexts and stories for long-term retention of words. Finally, both the experimental and control groups participated in a game-based storytelling circle activity. The instructor instructed the participants to form a circle in front of the board. Then, they were each given story cards. The learners were instructed to use the words on the story cards in sentences one by one. One of the learners recorded the sentences created. The instructor read the first sentence aloud, and the group members continued to add theirs. The first group to create and complete the story in a given time became the winner of the game. The story created by ChatGPT, and the storytelling games' cards can be seen in Figure 3.

Example Contextual Study of Target Words in ChatGPT

Once, there was a girl named Anna. She found an old **picture** in her attic. In the **picture**, a woman wore a beautiful **scarf**, an **expensive** dress, and **trainers**. Anna felt a **cold** chill as she looked at the woman's eyes.

Anna wore her own **scarf** and **trainers** and decided to visit the old house from the **picture**. When she arrived, she saw a **circle** of stones in the garden. In the center was the woman from the **picture**, still wearing the same **dress** and holding a small **purse**. Anna shivered.

The woman smiled and handed Anna a **cap**. "Put this on," she said. Anna did as **told**. Suddenly, she felt a strange pull and found herself dressed in the woman's **trousers** and shirt, standing in the **main** hall of the old house.

The woman whispered, "The **feature** of this house is its power to capture souls." Anna tried to run, but she was now part of the **picture** on the wall, frozen forever with the woman.

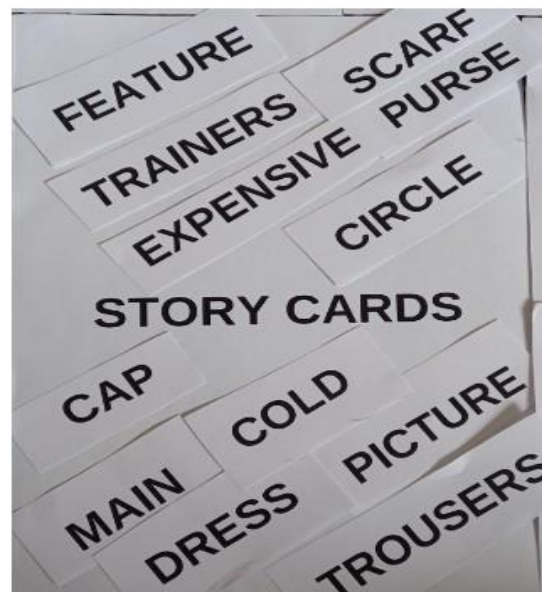


Figure 3

Example Contextual Study of Target Words and Story Cards

Week Three

During the third week, the participants learned grade-appropriate CEFR-based A1-level words and phrases using taboo cards. As a warm-up activity, the instructor wrote three sample words on the whiteboard. Then, the participants were asked to form small groups. Each group selected one person as the 'guesser'. The instructor set the timer for one minute. Other group members needed to provide verbal clues to help the guesser identify the word without using the taboo words. In the introduction part, the instructor explained to the participants that they would continue learning new vocabulary words that day using taboo cards. They were shown an example taboo card and told how the game works. The importance of using synonyms, antonyms, definitions, examples, or context to describe each word was emphasized. In the main activity, the instructor divided the group into two and gave each group six words to create taboo cards by giving them the prompt: 'Create taboo words for

this word.’ to ChatGPT. Then, they created their original taboo cards. After that, each group member took turns being the guesser. The other group members took turns giving verbal clues to help the guesser identify the word. The instructor set a time limit for each round and encouraged the participants to use active listening and critical thinking skills to guess the target words. The activity was repeated with different taboo cards, allowing all students to take turns being the guesser. In the control group, target words were prepared beforehand for them to play in their groups. In the closure part, students were asked to share one new vocabulary word they learned during the activity. All the words were reviewed with the whole class, discussing their meanings and use to ensure comprehension. Taboo cards used during the game activity can be seen in Figure 4.

maintain keep prolong build equipment expect	continue stop go continuum on carry on	pencil pen lead paper eraser sharpener	stone rock pebble granite wall cold
<i>Taboo Cards</i>			
share give divide stock together alike	sleep bed dream rest tired snooze	shopping spree bag list mall cart	hobby interest horse activity fun craft
coach train stage carriage team football	run walk jog race away chase	sit stand chair lap sat seat	dance sing song music party ballet

Figure 4

Taboo Cards

Week Four

During the fourth week, the participants learned and accurately used grade-appropriate CEFR-based A1 level vocabulary through games and Chat GPT. The participants were given a set of words and found concepts or associations related to the new words in Chat GPT, an AI tool. They took notes on a printable worksheet downloaded from the website *themeasuredmom.com* to use these as clues while playing the Heads Up game. To play the game, students were divided into two groups. Then, the rules of the game were explained. A student from each group was selected to be the first guesser. The guesser held the card on his or her forehead, without looking at it, while their group members provided clues to help them guess the word within one minute for each round. During the game, the participants were encouraged to use context clues, associated words, and concepts they found on Chat GPT to provide effective and relevant clues to their teammates. After each round, the meanings of the words were discussed, and the participants were provided with additional information or examples to reinforce comprehension. They were asked to individually write down new sentences about the words they learned during the game, along with their meanings. At the end of the lesson, the instructor provided students with a short quiz on the *Kahoot* website to assess their understanding of the new vocabulary. Heads Up game cards, printable worksheet, and *Kahoot* game page can be seen in Figure 5.

**NEW
WORD** _____

Write or sketch words or concepts
that relate to the new word.

©themeasuredmom.com



Copy the sentence that includes the word.
(Name of book _____)

Synonym(s)

Antonym(s)

Write the correct
definition from
the dictionary.



Illustrate the
meaning of the word.



Write an original, interesting, or funny
sentence using the new word. Make sure your
sentence shows what the word means.





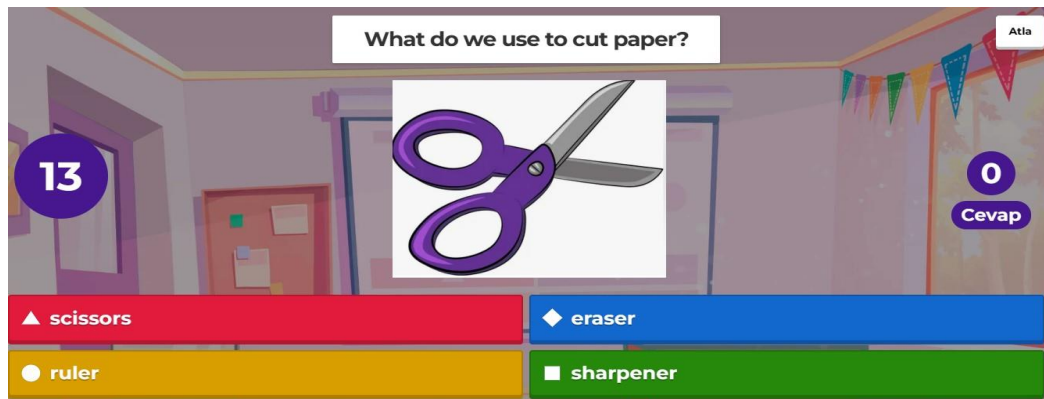


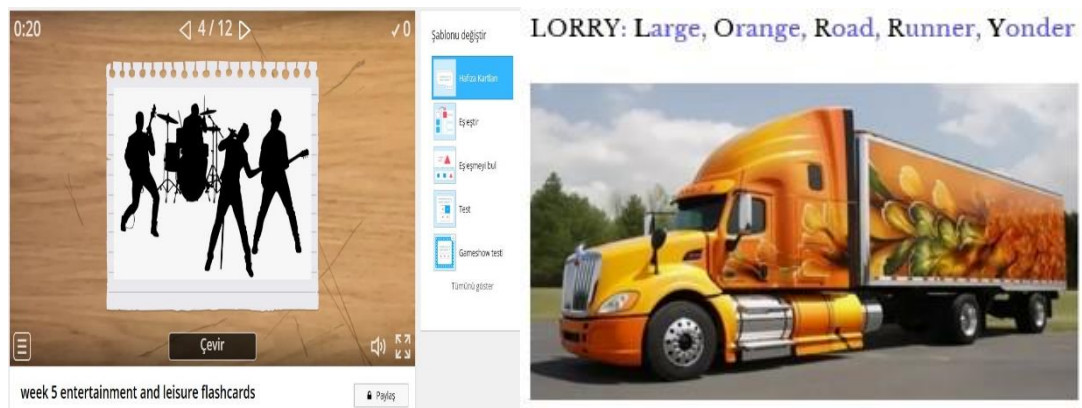
Figure 5
Worksheet Study, Heads Up Game Words, and Kahoot Game

Week Five

During the fifth week, the participants determined and clarified the meanings of unknown and multiple-meaning words and phrases based on CEFR-based A1 level vocabulary. First, the instructor showed the students the target words to be learned through flashcards prepared on the website called *Wordwall*. After giving the definitions of the words, the instructor told the participants to use Chat GPT to create mnemonic devices, such as funny riddles or silly details, to help them remember the words they found difficult. Then, the students shared these with their classmates. Next, the instructor explained that the participants would be playing a *Jeopardy Game* to review the vocabulary they had learned over five weeks. The game was created on the website called *Playfactile.com*. After dividing the class into two teams and selecting teams' avatars and nicknames on the smartboard, the instructor explained the rules of the game and how points would be awarded. Each team member took turns choosing a category and a point value. If the answers to the questions were correct, the teams earned points, but if the answers were wrong, they lost points. At the end of the game, points were awarded accordingly, and the

winning group was announced. The lesson concluded by distributing exit tickets to the students. They were asked to write down one vocabulary word they felt they had mastered during the game and provide personalized sentences for it. The activity links for the flashcards, example mnemonics, and the *Jeopardy Game* are illustrated in Figure 6.

Flashcards (<https://wordwall.net/tr/resource/67387909/week-5-entertainment-and-leisure-flashcards>)



Jeopardy Game (<https://playfactile.com/lrx8uef3a2/play>)

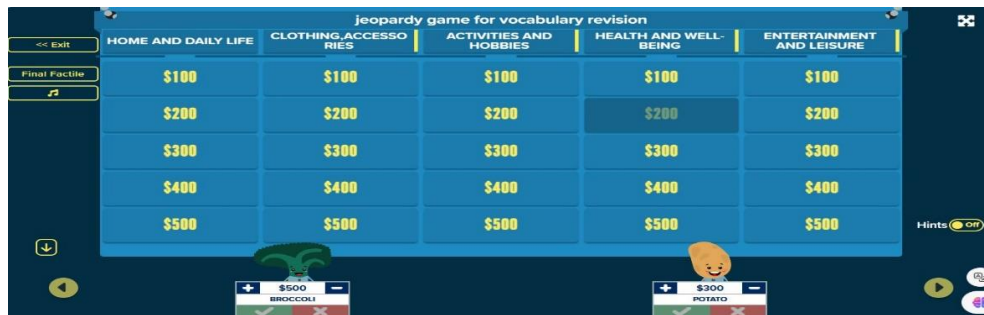


Figure 6

Wordwall flash cards, example mnemonics, and Jeopardy Game links

3.4.3. Post-test Implementation

During the final stage of the study, the vocabulary test was administered again. This test examines the vocabulary knowledge of students. It was aimed to detect any significant changes regarding students' vocabulary gains after the practice process.

3.5. Data Analysis

The Statistical Package for Social Sciences (IBM SPSS Statistics 21.0) was used for the study's data analysis. First, the participants' ages were computed. Next, the gender, grade, and proficiency levels of the participants were calculated. Then, the reliability coefficients were calculated through Cronbach's Alpha for the pre-tests and post-tests. As shown in the table, the reliability coefficient value of the pre-tests was 0.92, and it was 0.91 for the post-tests. The values given in the table showed a high level of reliability of the data.

Table 3

Reliability Coefficients of the Pre and Post-Tests

Tests	Reliability Coefficients (Cronbach's Alpha)
Pre-tests	.92
Post-tests	.91

To further analyze and compare the data, non-parametric methods were used since a normal distribution could not be assumed due to the size of the participants in the study. First, descriptive analysis was conducted to reveal the mean scores of the pre-tests and post-tests to determine the levels of vocabulary retention of each group before and after the implementation. Second, the Wilcoxon analysis was performed to determine if there were any significant differences concerning the vocabulary

retention levels between the pre-tests and post-tests of the control and experimental groups due to the implementation. Finally, after the implementation, the Mann-Whitney U analysis was performed to find out any differences in the vocabulary retention levels between the groups.

In addition to other analyses carried out in the study, a focus group interview was held, and the data obtained from the interview were examined in detail. A total of five questions were asked during the focus group interview, which was conducted face-to-face with a total of ten participants (five from the control group and five from the experimental group) and lasted 40 minutes. Each participant's answers were carefully recorded and then analyzed by the researcher. The analysis process was performed with the aim of an in-depth evaluation of the participants' views and deciding on the differences between the control and experimental groups. The personal information about the participants was kept confidential and the data was processed completely anonymously. The findings obtained in this process will be discussed in the next sections of the study.

4. FINDINGS

This section presents the results of the analysis of the data gained in the study, and it is related to the research questions. First, the vocabulary retention levels of the participants are provided. After that, the effects of the AI and gamification methods on EFL vocabulary learning are given. Finally, the data of the control and experimental groups are compared and presented.

4.1. Research Question 1: Does the use of gamification in traditional environments contribute to vocabulary learning among EFL learners?

4.1.1. The Vocabulary Learning Levels of the Control Group

Table 4 indicates the mean scores, standard error mean, and standard deviation of the pre and post-tests of the control group. Regarding the results gained from the vocabulary test, the score of 60 was evaluated as excellent, the score between 48-59 was evaluated as very satisfactory, the score between 43-47 was evaluated as satisfactory, the score between 36-42 was evaluated as little satisfactory, and the score under 35 was evaluated as not satisfactory (Tapia, 2021). Based on this scale, the score for the control group was not satisfactory before the implementation but was satisfactory after the implementation. According to the table, the vocabulary retention levels of the control group increased from 25.75 to 44.18 after they completed the vocabulary games.

Table 4**The Mean Scores for Vocabulary Retention Level in the Control Group**

Tests	N	Mean	Std. Error	Standard Deviation
Total scores for the pre-test	16	25.75	1.71	6.86
Total scores for the post-test	16	44.18	2.23	8.93

Table 5 shows the number of positive ranks, mean ranks, sum of ranks, and significance level of the comparison of pre-test and post-test scores of the control group. Based on the comparison, the significance level was .00, and the post-test scores with a mean rank of 8.50. In other words, there was a change in the vocabulary retention levels of the control group, and it was statistically significant.

Table 5**Comparison of Pre-and Post-Tests Scores of the Control Group (WilcoxonTest)**

Ranks		N	Mean Ranks	Sum of Ranks	Asymp. Sig. (2-tailed)
Post-test-Pre-test	Negative Ranks	16	8.50	136.00	.00
	Positive Ranks	0	.00	.00	
	Ties	0			
	Total	16			

4.1.2. The Vocabulary Learning Levels of the Experimental Group

Table 6 shows the mean scores, standard error mean, and standard deviation of the pre and post-tests of the experimental group. Based on the criterion, the score for the experimental group was not satisfactory before the implementation; however, it was very satisfactory after the implementation. As can be seen in the table, there was an

increase in the mean scores for vocabulary learning from 31.50 to 49.06 after completing games.

Table 6

The Mean Scores for Vocabulary Retention Level in the Experimental Group

Tests	N	Mean	Std. Error	Standard Deviation Statistic
Total scores for the pre-test	16	31.50	3.45	13.81
Total scores for the post-test	16	49.06	2.31	9.24

Table 7 shows the number of positive and negative ranks, mean ranks, sum of ranks, and significance level of the comparison of pre and post-test scores of the experimental group. Based on the comparison, the significance level was .00 and the post-test scores of 16 participants were higher than their pre-test scores with a mean rank of 8.50. In other words, there was a change in the vocabulary retention levels of the experimental group, and there was a significant difference between the tests.

Table 7

Comparison of Pre-and Post-Tests Scores of the Experimental Group (Wilcoxon Test)

Ranks		N	Mean Ranks	Sum of Ranks	Asymp. Sig. (2-tailed)
Post-test- Pre-test	Negative Ranks	16	8.50	136.00	.00
	Positive Ranks	0	.00	.00	
	Ties	0			
	Total	16			

4.2. Research Question 2: Does the use of AI-enhanced gamification contribute to vocabulary learning among EFL learners?

4.2.1. Gamification Effect on Vocabulary Learning

The results of the Wilcoxon test based on the comparison of the pre-tests and post-tests through a pairing of each item in the vocabulary test in terms of the vocabulary learning levels of the participants in the control group were presented in the appendices (See Appendix C and Appendix D). The levels of significance were above the specified level of significance which is .05 apart from the thirty-two items. First, the significance level of the first item on testing receptive vocabulary was .05, indicating an increase in receptive vocabulary retention levels. The mean rank for this item was 4.00. Second, the significance level of the second item on testing receptive vocabulary was .00. This was also a sign of an increase in receptive vocabulary retention levels. The mean rank for the positive ranks was .00. Third, the third item had a significance level of .01 which showed an increase in receptive vocabulary retention levels. This difference between the pre and post-tests revealed that learners showed an increase in their receptive vocabulary retention levels with a mean rank of .00. Similarly, the significance level for the fourth item on receptive vocabulary retention was .01. This item indicated an improvement in receptive vocabulary retention with a mean rank of .00. In addition, the fifth item on receptive vocabulary retention had a significance level of .00. It was also a sign of an increase in receptive vocabulary retention levels. Learners experienced an increase in their receptive vocabulary retention levels with a mean rank of .00. Additionally, the sixth item, which had a significance level of .02 was about receptive vocabulary retention. The item indicated a rise in receptive vocabulary retention levels with a mean rank of

5.00. The significance level for the seventh item on receptive vocabulary retention was .01 and it showed an increase in receptive vocabulary retention levels of the participants. The mean rank was .00 for the positive ranks of the item. Moreover, the significance level for the eighth item was .05, indicating a considerable increase in receptive vocabulary retention levels. After the practice, learners' receptive vocabulary retention levels improved with a mean rank of 4.00. Furthermore, the significance level for the ninth item was .04, which was related to receptive vocabulary retention. With a rank of .00, learners increased their receptive vocabulary retention levels. Besides, the significance level for the tenth item on receptive vocabulary retention was .03, which showed a significant increase in receptive vocabulary retention levels. The mean rank for this item was 4.50. Additionally, the significance level for the eleventh item on receptive vocabulary retention was .00, which showed a significant increase in receptive vocabulary retention levels. Learners increased their vocabulary retention levels with a mean rank of .00. The twelfth item was related to receptive vocabulary retention and had a significance level of .02. The mean rank was .00 for the positive ranks, and learners increased their receptive vocabulary retention levels. Furthermore, the significance level for the thirteenth item on receptive vocabulary retention was .00. This item was related to receptive vocabulary retention and indicated an improvement in receptive vocabulary retention levels with a mean rank of .00. In addition, the fourteenth item on receptive vocabulary retention had a significance level of <.00. It was also a sign of an increase in receptive vocabulary retention levels. Learners experienced an increase in their receptive vocabulary retention levels with a mean rank of 8.00. Additionally, the fifteenth item, which had a significance level of .02, was about

receptive vocabulary retention and indicated an increase in receptive vocabulary retention levels. The mean rank for the item was 5.00. The significance level for the sixteenth item on receptive vocabulary retention was .00 and it showed an increase in receptive vocabulary retention levels. The mean rank was .00 for the positive ranks. Moreover, the significance level for the seventeenth item was .02, indicating a considerable increase in receptive vocabulary retention levels. The item had a mean rank of 6.50. Furthermore, the significance level for the eighteenth item on receptive vocabulary retention was .05. With a mean rank of 4.00, learners increased their receptive vocabulary retention levels. Besides, the significance level for the nineteenth item on the table was .01. The mean rank was .00 for the positive ranks, indicating an increase in the productive vocabulary retention levels of the participants. Then, the significance level for the twentieth item on productive vocabulary retention was .02, which showed an increase in vocabulary retention levels with a mean rank of .00. The twenty-first item was related to productive vocabulary retention and had a significance level of .00. The mean rank was .00 for the positive ranks, indicating an increase in productive vocabulary retention levels. The significance level for the twenty-second item on productive vocabulary retention was .04. This item indicated an improvement in productive vocabulary retention levels with a mean rank of .00. In addition, the twenty-third item had a significance level of .02. It was also a sign of an increase in productive vocabulary retention levels with a mean rank of .00. Additionally, the twenty-fourth item had a significance level of .05. The item indicated an increase in productive vocabulary retention levels and the mean rank was 4.00. The significance level for the twenty-fifth item was .00. The mean rank was .00 and learners were found to increase their

productive vocabulary retention levels. Moreover, the significance level for the twenty-sixth item was .00, indicating an increase in productive vocabulary retention levels after the practice with a mean rank of .00. Furthermore, the significance level of the twenty-seventh item was .01, which was related to productive vocabulary retention. With a mean rank of .00, learners increased their productive vocabulary retention levels. Besides, the significance level of the twenty-eighth item was .00, indicating an increase in productive vocabulary retention levels after the practice with a mean rank of .00. Similarly, the significance level of the twenty-ninth item was .00. This was also a sign of increase in productive vocabulary retention levels of the learners. The mean rank for the positive ranks was .00. Then, the thirtieth item had a significance level of $< .00$. This difference between the pre-and post-tests revealed that learners showed an increase in their productive vocabulary retention levels with a mean rank of .00. Additionally, the thirty-first item, which had a significance level of .00 indicated an increase in productive vocabulary retention levels. The mean rank was .00. Last but not least, the significance level for the last item on the table was $< .00$. This significant increase in productive vocabulary retention levels revealed learners' improvement after the practice.

4.2.2. AI-enhanced Gamification Effect on Vocabulary Learning

The Wilcoxon test was implemented for the experimental group as well to reveal any effects of the use of AI-enhanced gamification on the participants' vocabulary learning (See Appendix E). The results of the Wilcoxon test based on the comparison of the pre-tests and post-tests through a pairing of each item in the vocabulary test in terms of the vocabulary learning levels of the participants in the experimental group were presented in the appendices (See Appendix F). The levels of significance were

above the specified level of significance which is .05 apart from the thirty-seven items. To begin with, the significance level for the first item on the receptive vocabulary retention levels of the participants was .04, which showed a significant increase in receptive vocabulary retention levels. Learners increased their vocabulary capacity with a mean rank of .00. The second item on receptive vocabulary retention had a significance level of .00. The mean rank was .00 for the positive ranks. The significance level for the third item on receptive vocabulary retention was .02. This item indicated an improvement in receptive vocabulary retention levels with a mean rank of .00. In addition, the fourth item on receptive vocabulary retention had a significance level of .00. Learners increased their receptive vocabulary retention levels with a mean rank of .00. Additionally, the fifth item, which also had a significance level of .00, was about receptive vocabulary retention and indicated an increase in receptive vocabulary retention levels. The mean rank was .00 for the item. The significance level for the sixth item on receptive vocabulary retention was .00 and it showed an increase in receptive vocabulary retention levels. The mean rank was .00 for the positive ranks. Similarly, the significance level for the seventh item was .00, indicating an increase in receptive vocabulary retention levels after the practice with a mean rank of .00. Furthermore, the significance level for the eighth item on receptive vocabulary retention was .01. With a mean rank of .00, learners had an increase in their receptive vocabulary retention levels. Next, the significance level of the ninth item on learners' receptive vocabulary retention was .04. This significant difference between the pre and post-tests revealed an increase in receptive vocabulary retention levels after the interaction with AI-enhanced games with a mean rank of .00. Then, the significance level of the tenth item on receptive

vocabulary retention was .00. This was a sign of an increase in receptive vocabulary retention levels. The mean rank for the positive ranks was .00. Besides, the eleventh item had a significance level of .01 which showed an increase in receptive vocabulary retention levels. Learners showed an increase in their receptive vocabulary retention levels with a mean rank of .00. What's more, the significance level for the twelfth item on the participants' receptive vocabulary retention was .00, which showed a significant increase in receptive vocabulary retention levels. Learners increased their vocabulary capacity with a mean rank of .00. The thirteenth item was related to receptive vocabulary retention and had a significance level of .01. The mean rank was .00 for the positive ranks. Similarly, the significance level for the fourteenth item on receptive vocabulary retention was .01. This item indicated an improvement in receptive vocabulary retention levels with a mean rank of .00. In addition, the fifteenth item had a significance level of .00. It was a sign of an increase in receptive vocabulary retention levels. Learners experienced an increase in their vocabulary retention levels with a mean rank of .00. Additionally, the sixteenth item, which had a significance level of .02, was about receptive vocabulary retention and indicated an increase in vocabulary retention levels. Learners showed an improvement in their vocabulary capacity and the mean rank was .00. The significance level for the seventeenth item on receptive vocabulary retention was .03 and it showed a rise in receptive vocabulary retention levels. The mean rank was 4.50 for the positive ranks, and learners were found to improve their vocabulary capacity. Moreover, the significance level for the eighteenth item was .00, indicating a considerable increase in receptive vocabulary retention levels. After the practice with AI-enhanced games, more learners improved their scores on the test with a

mean rank of .00. Furthermore, the significance level for the nineteenth item on receptive vocabulary retention was .03. With a mean rank of 4.50, learners improved their receptive vocabulary retention levels. Besides, the significance level for the twentieth item was .02, which showed an increase in the receptive vocabulary retention levels of the participants. Learners improved their vocabulary capacity with a mean rank of .00. In addition, the twenty-first item on receptive vocabulary retention had a significance level of .00. The mean rank was .00 for the positive ranks, and learners improved their receptive vocabulary retention levels. Similarly, the significance level for the twenty-second item was .00. This item was related to receptive vocabulary retention and indicated an improvement in receptive vocabulary retention levels with a mean rank of .00. Moreover, the twenty-third item had a significance level of .02. It was also a sign of an increase in receptive vocabulary retention levels. The participants experienced an increase with a mean rank of .00. Additionally, the twenty-fourth item, which had a significance level of .04, was about productive vocabulary retention and indicated an increase in productive vocabulary retention levels. The mean rank was .00 for the item. Similarly, the significance level for the twenty-fifth item was .04. This item was also related to productive vocabulary retention and indicated an increase in productive vocabulary retention levels with a mean rank of .00. The significance level for the twenty-sixth item was .02 and it showed an increase in productive vocabulary retention levels. The mean rank was .00 for the positive ranks. What is more, the significance level for the twenty-seventh item was .00, indicating an increase in productive vocabulary retention levels. After the implementation, more participants improved their productive vocabulary retention levels with a mean rank of .00. Furthermore, the

significance level for the twenty-eighth item was .04, which was related to productive vocabulary retention. With a mean rank of .00, learners improved their productive vocabulary retention levels. Additionally, the significance level of the twenty-ninth item was .04, indicating an increase in productive vocabulary retention levels. This difference between pre and post-tests revealed that learners improved their vocabulary capacity after the practice with a mean rank of .00. Next, the significance level of the thirtieth item was .00. This was also a sign of an increase in productive vocabulary retention levels. The mean rank for the positive ranks was .00. Similarly, the significance level for the thirty-first item was .00. This item was also related to productive vocabulary retention and indicated an increase in productive vocabulary retention levels with a mean rank of .00. Then, the significance level for the thirty-second item was .00, which showed an increase in productive vocabulary retention levels. The participants improved their productive vocabulary retention levels with a mean rank of .00. The thirty-third item about productive vocabulary retention had a significance level of .00. The mean rank was .00 for the positive ranks, and learners improved their productive vocabulary retention levels. After that, the significance level for the thirty-fourth item was .04. This item indicated an improvement in productive vocabulary retention levels with a mean rank of .00. In addition, the thirty-fifth had a significance level of .04. Learners experienced an increase in productive vocabulary retention levels with a mean rank of .00. Additionally, the twenty-sixth item, which had a significance level of .00, indicated an increase in productive vocabulary retention levels. The mean rank was .00. Last but not least, the significance level for the last item was .01. The mean rank was .00.

This significant increase in productive vocabulary retention levels revealed that learners improved their vocabulary capacity after practice with AI-enhanced games.

4.3. Research Question 3: Is there a difference between the use of gamification in traditional environments and AI-enhanced gamification regarding vocabulary learning among EFL learners?

4.3.1. Comparison of Gamification and AI-enhanced Gamification

The Mann-Whitney U test was conducted to reveal any differences between the control and experimental groups. Table 8 shows the mean rank, sum of ranks, and significance value between the results of the pre-tests of the groups. It was revealed that the mean rank was 15.13 for the control group, whereas it was 17.88 for the experimental group. Nevertheless, there was no significant difference between the two groups in terms of their pre-test scores and the significance value was .40, which was above the specified significance level.

Table 8

Pre-test Scores for the Control and Experimental Groups (Mann-Whitney U test)

Group		Mean Rank	Sum of Ranks	Asymp. Sig. (2-tailed)
Pre-test	Control Group	15.13	242.00	.40
	Experimental Group	17.88	286.00	

Table 9 shows the items that showed a difference, and they were regarding receptive and productive vocabulary retention (See Appendix G). To begin with, the significance level for the first item was .03 which was below the specified significance level; thus, there was a considerable difference between the two groups

concerning the item. The mean rank was 14.50 for the control group while it was 18.50 for the experimental group which was higher. The second item had a significance level of .05. The mean rank was 14.00 for the control group while it was 19.00 for the experimental group which was higher. The significance level for the third item was .01. The mean rank was 20.00 for the control group while it was 13.00 for the experimental group which was lower. In addition, the fourth item had a significance level of .03. The mean rank was 13.50 for the control group while it was 19.50 for the experimental group which was higher. Additionally, the fifth item had a significance level of .01. The mean rank was 13.00 for the control group while it was 20.00 for the experimental group which was higher. Last but not least, the significance level for the last item on the table was .00. The mean rank was 13.50 for the control group while it was 19.50 for the experimental group which was higher.

Table 9

The Mann-Whitney U Test Results for the Pre-tests of the Control and Experimental Groups

	Group	N	Mean Rank	Sum of Ranks	Asymp. Sig. (2-tailed)
25. Not good.	Control group	16	14.50	232.00	.03
	Experimental group	16	18.50	296.00	
	Total	32			
33. UPSET: He is upset.	Control group	16	14.00	224.00	.05
	Experimental group	16	19.00	304.00	
	Total	32			

42. They are the main ingredients for French fries.	Control group	16	20.00	320.00	.01
	Experimental group	16	13.00	208.00	
	Total	32			
54. You can play soccer with this.	Control group	16	13.50	216.00	.03
	Experimental group	16	19.50	312.00	
	Total	32			
58. If you want to buy food, you go to this place.	Control group	16	13.00	208.00	.01
	Experimental group	16	20.00	320.00	
	Total	32			
60. You take this after learning a lot of subject.	Control group	16	13.50	216.00	.00
	Experimental group	16	19.50	312.00	
	Total	32			

Table 10 shows the mean rank, sum of ranks, and significance value of the results of the post-tests of the control and experimental groups. It was revealed that the mean rank was 13.81 for the control group, whereas it was 19.19 for the experimental group which was higher. However, there was no significant difference between their post-test scores, as the significance value was .10.

Table 10

Post-test Scores for the Control and Experimental Groups (Mann-Whitney U test)

Group		Mean Rank	Sum of Ranks	Asymp. Sig. (2-tailed)
Post-test	Control Group	13.81	221.00	.10
	Experimental Group	19.19	307.00	

Table 11 presents six items found to have a significant correlation between the post-test results of the control and experimental groups (See Appendix H). First, the mean rank regarding the item on receptive vocabulary retention was 14.00 for the control group and 19.00 for the experimental group. This indicated the mean rank for the experimental group was higher than the control group, and there was a noticeable difference between the two groups as the significance value of the item was .01. Next, the analysis of the item regarding receptive vocabulary retention revealed that the mean rank of the control group was 13.00 whereas it was 20.00 for the experimental group. The higher mean rank of the experimental group and the significance value of .00 indicated there was a considerable difference between the two groups after the implementation. Then, another item on receptive vocabulary retention revealed a difference between the groups. The mean rank was 13.50 for the control group while it was 19.50 for the experimental group. The significance value of the item was .03. After that, the item related to receptive vocabulary retention had a mean rank of 13.50 for the control group and 19.50 for the experimental group. The significance value of the item was .00. Another item that showed a significant difference was productive vocabulary retention. The item had a mean rank of 13.00 for the control group and 20.00 for the experimental group. It had a significance value of .00, and the experimental group outperformed the control group. Finally, the item related to productive vocabulary retention had a mean rank of 13.50 for the control group and 19.50 for the experimental group. The significance value was .02, indicating a statistically significant difference between the two groups. Overall, the experimental group seemed to have better receptive and productive vocabulary retention after the practice.

Table 11

The Mann-Whitney U Test Results for the Post-tests of the Control and Experimental Groups

	Group	N	Mean Rank	Sum of Ranks	Asymp. Sig. (2-tailed)
15. Ingredient for the soup.	Control group	16	14.00	224.00	.01
	Experimental group	16	19.00	304.00	
	Total	32			
29. Person who trains a team.	Control group	16	13.00	208.00	.00
	Experimental group	16	20.00	320.00	
	Total	32			
32. STONE: She sat on a stone.	Control group	16	13.50	216.00	.03
	Experimental group	16	19.50	312.00	
	Total	32			
39. POCKET: I keep it in my pocket.	Control group	16	13.50	216.00	.00
	Experimental group	16	19.50	312.00	
	Total	32			
49. You use it to draw and write.	Control group	16	13.00	208.00	.00
	Experimental group	16	20.00	320.00	
	Total	32			
51. It is played with small pieces on a large board.	Control group	16	13.50	216.00	.02
	Experimental group	16	19.50	312.00	
	Total	32			

5. CONCLUSIONS and DISCUSSION

In this section, the conclusions of the study and discussion regarding the effects of AI-enhanced gamification on vocabulary learning are presented. First, the conclusions are provided. Then, the findings of the current study are discussed regarding the findings of the previous related studies. Next, suggestions are presented for educators, learners, and policymakers. Finally, recommendations for further research are presented.

5.1. Conclusions

In the study that aims to explore the effects of AI-enhanced gamification on EFL learners' vocabulary learning and compares the use of AI-enhanced gamification and a traditional gamification method in an EFL class to find out whether there is any difference, several conclusions can be drawn based on the findings obtained above. The first conclusion is that traditional gamification positively affects vocabulary retention and overall learning outcomes by making the vocabulary learning process more interactive for learners. However, AI-enhanced gamification takes these benefits a step further by incorporating advanced technologies like ChatGPT and its functions such as machine learning algorithms, adaptive or personalized learning systems, real-time feedback, and natural language processing. These enhancements lead to a more effective and fruitful learning process, resulting in improved vocabulary retention and learning outputs compared to the traditional gamification method. As a result, while the traditional gamification method demonstrates a positive impact on vocabulary retention and learning among EFL learners, AI-

enhanced gamification seems to be more effective in vocabulary retention and mastery. Second, according to the research findings, learners who benefit from the traditional gamification method achieve a satisfactory level of vocabulary capacity and retention, improving their vocabulary learning skills effectively. In contrast, AI-enhanced gamification leverages advanced technologies to elevate the vocabulary learning experience further. AI enhancement significantly boosts learners' vocabulary learning performance from a poor to a very satisfactory level, making them more competent in learning new vocabulary compared to the traditional gamification method. As a result, while the traditional gamification method leads to satisfactory improvements in vocabulary learning capacity among EFL learners, AI-enhanced gamification is markedly more effective. Thus, integrating AI into gamified learning environments represents a significant advancement in EFL vocabulary learning. Third, learners achieve satisfactory improvements in both receptive and productive vocabulary capacities after using the traditional gamification method. However, AI-enhanced gamification significantly boosts learners' receptive and productive vocabulary capacities and retention levels compared to the traditional gamification method thanks to its advanced and contextually rich qualifications and opportunities. The combination of AI with games enables learners to encounter new words, understand, remember, and use them efficiently in comprehension and communication not only in virtual environments but also in real life. As a result, while traditional gamification leads to satisfactory improvements in EFL learners' receptive and productive vocabulary retention, AI-enhanced gamification seems to be significantly more effective in vocabulary learning.

The results of a focus group study indicate that the abovementioned conclusions may relate to several factors. In terms of vocabulary learning, participants who receive gamification state that games are an opportunity for them to study, learn, practice, and revise new words in a fun way according to their proficiency levels. Additionally, games are engaging and motivating sources for them to sustain their attention and participation in the lesson by boosting their desire to learn. Moreover, the participants believe that not only are games practical for their vocabulary retention, but they can also help them to solve lack of concentration problems. Moreover, they believe that team games such as Taboo and Jeopardy contribute to their social identity development positively. Furthermore, some of the participants believe that games aid their visual memory and enable them to retrieve words from their memory easily when they need to use these words in spoken and written production tasks inside and outside the classroom. The participants who receive AI-enhanced gamification from ChatGPT think that they are in a digital era and prefer modern and innovative learning strategies to conventional strategies. Some of the participants believe that studying vocabulary in course books and printed dictionaries is a boring activity. They also believe that ChatGPT is a better assistant for creating authentic sentences and searching the special use of vocabulary when compared to using non-digital or digital dictionaries. They state that when they do not have an opportunity to ask questions related to the problems encountered while using vocabulary from their teachers, ChatGPT assists them like a private tutor. They also state that AI-enhanced gamification addresses their individual needs through real-time feedback and personalization opportunities whenever and wherever they want. According to them, it is an easy and motivating way to solve their problems related

to vocabulary learning. Specifically, words in contextual stories created by ChatGPT attract the participants and they state that they find this vocabulary learning strategy very beneficial for vocabulary revision and retention. In conclusion, the current study explores the effects of AI-enhanced gamification on EFL learners' vocabulary learning compared to traditional gamification. It finds that traditional gamification positively impacts vocabulary retention and learning outcomes by making the process interactive and engaging. However, AI-enhanced gamification, incorporating technologies like ChatGPT, seems to be more effective. Learners using AI-enhanced gamification show improved vocabulary retention and learning outcomes, outperforming those using the traditional gamification method. In conclusion, EFL learners express that games, whether traditional or AI-enhanced, make learning fun, engaging, and practical for vocabulary retention, and find AI-enhanced gamification particularly beneficial due to its modern, innovative approach, real-time feedback, and personalization, making vocabulary learning more efficient and motivating. Therefore, integrating AI into gamified learning environments represents a significant advancement in EFL vocabulary learning and provides valuable insights for teachers, academicians, and language learning technology application designers in the creation and implementation of vocabulary learning strategies.

5.2. Pedagogical Implications

Several pedagogical implications can be made in light of the current study and previous literature. First, the findings seem to be in line with the previous findings indicating that gamification positively affects receptive and productive vocabulary retention and overall learning outcomes (Ahmed et al., 2022; Lam, 2014; Thiagarajah et al., 2022; Saleh & Althaqafi, 2022; Panmei & Waluyo, 2023).

Moreover, the conclusions of the present study show that gamification is an opportunity to study, learn, practice, and revise words in a fun way (Waluyo & Bucol, 2021; Waer, 2021; Stephenson & Rumley, 2005). In addition, although this study does not reach any negative effect of gamification concerning intrinsic motivation, Hanus and Fox (2015) note that for students who are already motivated to learn, gamified activities might harm their intrinsic motivation. On the contrary, the findings of the present study indicate that games' engaging and motivating features contribute to sustaining attention and participation by boosting learners' self determination to learn new words (Ahmed et al., 2022; Genç Ersoy & Belet Boyacı, 2021). On the other hand, no finding is available regarding the negative effect caused by gamified competition, while Zhang and Hasim (2023) note that gamified competition affects learning negatively. The present study shows that gamification of vocabulary in the classroom, specifically the team-based ones including a gamified competition spirit, enhances learners' social interaction, collaboration, and mental lexicon through communicative tasks as previously concluded (Roebuck, 1998; Vygotsky, 1980; Verga & Kotz, 2017; Bakhsh, 2016; Gozcu & Caganaga, 2016). Next, the study has a correspondent finding to the prior ones showing that gamification aids visual memory and enables learners to retrieve words from their memory easily when needed to be used in spoken and written production (Sadeghi & Farzizadeh, 2013; Quynh, 2022; Hashemi, 2021; Razali & Ismail, 2017). In addition, the findings of the present study indicate that gamification helps learners solve their lack of concentration problems while studying words (Ahmed et al., 2022; Csikszentmihalyi & Davis, 1975). On the other hand, while Zohrabi et al. (2018) conclude that gamification boosts rote learning and leads to isolated vocabulary

learning, the current study concludes that using words in storytelling activities through gamification is beneficial for meaningful and contextualized learning as also concluded in previous studies (Zhai & Wibowo, 2023; Chen, 2016). In terms of AI-enhanced gamification and its effect on vocabulary learning, there is no research in the literature. Since the research on AI-enhanced gamification has generally been made on EFL language skills together with pronunciation, there is no direct study on AI-enhanced gamification on vocabulary learning. However, there are some indirect research results from journal articles. Therefore, this study is quite contributive to the literature. First, according to the present study, the use of AI-enhanced gamification enhances EFL learners' receptive and productive vocabulary capacities and retention levels (Katemba, 2022; Wang & Petrina, 2013; Lai & Chen, 2023; Na-Young, 2020). Moreover, the AI-enhanced gamification method significantly boosts learners' vocabulary learning performances from a poor to a very satisfactory level, making them more competent in learning new vocabulary (Fryer et al., 2019; Irzawati, 2023; Kusumadewi & Widyastuti, 2018; Esmaeili & Shahrokhi, 2020; Nasution, 2022; Prasetyo et al., 2018). In addition, the findings of the current study indicate that learners prefer modern and innovative learning strategies, such as digital learning platforms to conventional strategies or materials (Alshumaimeri, 2008; Arini et al., 2022). On the other hand, interestingly while Alsadoon (2021) concludes that the use of a printed dictionary is the most favored and effective tool when compared to AI chatbots, this study indicates that learners find studying vocabulary in printed dictionaries and course books boring as concluded by Li (2021). Moreover, the conclusions of the current study show that AI chatbots are better assistants than private tutors for helping to create personalized, authentic, and semantically correct

sentences from key words and searching the special and detailed use of vocabulary (Alsadoon, 2021; Ghafar et al., 2023; Kasepalu et al., 2022). Furthermore, the study has a correspondent finding to the prior ones showing that AI chatbot addresses learners' individual needs through immediate feedback and personalization options while learning the special use of vocabulary (Şenel & Akman, 2016; Hovsepyan, 2022; Murtaza et al., 2022; Sumakul et al., 2022; Abbas et al., 2023; Tapalova & Zhiyenbayeva, 2022; Schmidt & Strasser, 2022). The results of the current study also show that AI-enhanced gamification is an easy and motivating way to solve learners' problems that they confront while vocabulary learning, as found by Li (2021). As a result, AI-enhanced gamification plays a crucial role in the vocabulary learning process by allowing students to enhance their receptive and productive vocabulary retention levels, optimize their vocabulary learning performances to better conditions, to be one step ahead of traditional methods by using innovative and trendy methods in the technology era, to receive support without limits of time and place, and to have differentiated and personalized vocabulary learning routes according to their own pace and levels.

5.3. Practical Recommendations

Based on the findings of the current study, several practical suggestions can be made. First, teachers should use both games and AI chatbots, such as ChatGPT to improve learners' vocabulary retention levels and capacities and provide a fun, engaging, motivating, collaborative, competitive, research-oriented, and peaceful atmosphere in their classes. Teachers should pay attention to match the features of ChatGPT with their students' ages, levels, and interests while planning their vocabulary teaching lessons. While using ChatGPT, the main purpose should be

related to vocabulary, and it should not overemphasize fun over vocabulary learning. ChatGPT should closely follow learners' progress and give meaningful and supportive feedback to learners to improve their weaknesses about vocabulary. ChatGPT should include the features of games that attract students' interests, such as avatars, rewards, points, badges, leaderboards, and challenges. To illustrate, an owl dances when the player gives the correct answer to the question. Features like this in game-based applications, such as Duolingo, should be integrated into ChatGPT to support vocabulary retention. In this way, students can be attracted to the game world and become open to learning new words. The chat feature of ChatGPT can improve students' vocabulary skills, and there may occur incidental vocabulary learning opportunities for new words while searching the game characters' names, trying to understand the directions of the game, and communicating with the chatbot. ChatGPT should not only help retain new words in long-term memory, but also allow learners to make revisions and sentences from learned words by sending notifications over mobile applications at intermittent times. Selecting English as a language choice also exposes learners to a wide range of English words, collocations, and phrases on ChatGPT. In terms of school administrations, they should integrate ChatGPT and vocabulary games into their agenda. To illustrate, there should be regular international or national seminars, in-service trainings, forums, conferences, and workshops for English teachers to help them how to teach vocabulary by using ChatGPT and games, and support their vocabulary teaching skills and strategies with the latest technology and trends in AI sector. Second, school administrations should invest in hardware and technical infrastructure such as AI-enhanced gamification platforms and internet connection protocols. Each student should benefit from these

technological resources free and fairly while learning vocabulary. Third, in terms of English curriculum designers, before integrating AI-based gamification procedures into vocabulary, they should begin with pilot programs and test the efficiency of AI and gamification tools for vocabulary in various parts of the country to get feedback and start attempts. Curriculum designers and material developers should make their plans by taking into account the opinions and suggestions of English teachers and their innovative ideas regarding vocabulary teaching. The most important reason for this is that English teachers are in the kitchen of teaching vocabulary and have enough experience. Therefore, it is important to create fun, interesting, motivating, and culturally suitable content by developing and innovating all themes and units' vocabulary based on AI and gamification in all textbooks and educational materials from 2nd to 12th grades. Finally, policymakers should invest in AI and gaming technologies by allocating funding to schools and universities. Policymakers should develop policies that assist the integration of AI and games into teaching vocabulary according to viewpoints of English teachers and academicians. MONE should decide on clear instructions for the use of AI and games for teaching vocabulary in EFL classes to meet quality standards in Türkiye.

5.4. Limitations

The current study has several limitations. First, this present study is limited to a total of 32 fifth-grade secondary school students studying at a public school, including 16 students in the control group and 16 students in the experimental group. Therefore, the findings gained from this study may not be applicable to other contexts in terms of time, place, participants, and process. Second, the implementation period is limited to five weeks. A longer implementation period may

reveal different results. Therefore, analysis of any significant differences that might exist at baseline between experimental and control groups is limited. Third, this study benefits from a quasi-experimental study design due to the use of pre-existing groups instead of random sampling of participants. Moreover, only ChatGPT was used as an AI tool in the current study. As a result, the researchers should take all these limitations into account while dealing with this topic in their study.

5.5. Recommendations for Further Research

According to the results of this study, several recommendations for further research can be made. First, more research should be done on the effects of AI-enhanced gamification on EFL learners' vocabulary learning. To boost reliability and generalizability, the sample diversity of the study should be expanded by involving more learners from different secondary schools and with different social backgrounds. More elaborate research can be done on the ease of use and efficiency of AI tools. Furthermore, to further examine the quality and effect of AI-enhanced gamification, a content analysis should be implemented to compare the efficacy of both traditional gamification and AI-enhanced gamification on learners' vocabulary learning. The impact of AI-enhanced gamification on vocabulary learning should be analyzed separately and elaborately in different aspects of vocabulary learning such as register, context, morphology, etymology, corpora, syntax, semantic relations, idiomatic expressions, and lexical relations. Thus, it can be analyzed in which areas of AI-enhanced gamification can be used more efficiently and efficaciously. In addition, implementing a similar study with learners with different language proficiency levels could indicate whether the efficiency of AI-enhanced gamification

changes according to proficiency level. This can provide essential insight into customizing teaching methods and materials. Furthermore, with the use of AI-enhanced gamification, the correlation between vocabulary learning and reading comprehension skills, digital literacy, and academic success can be examined.

REFERENCES

- Abbas, N., Ali, I., Manzoor, R., Hussain, T., & AL Hussaini, M. H. (2023). Role of artificial intelligence tools in enhancing students' educational performance at higher levels. *Journal of Artificial Intelligence, Machine Learning and Neural Network*, 3(5), 36–49. <https://doi.org/10.55529/jaimlenn.35.36.49>
- Afzal, N. (2019). A study on vocabulary learning problems encountered by BA English majors at the university level of education. *Arab World English Journal*, 10(3), 81–98. <https://dx.doi.org/10.24093/awej/vol10no3.6>
- Ahmed, A. A. A., Widodo, M., Komariah, A., Hassan, I., Abbas, A. K., & Rohi, A. (2022). Assessing the effects of gamification on developing EFL learners' idiomatic knowledge: Do attitudinal factors contribute to the learning of the idioms with the game? *Education Research International*, 2022, 1–10. <https://doi.org/10.1155/2022/2482570>
- Ahn, T., & Lee, S.-M. (2016). User experience of a mobile speaking application with automatic speech recognition for EFL learning. *British Journal of Educational Technology*, 47(4), 778–786. <https://doi.org/10.1111/bjet.12354>
- Alfuhaid, S. R. (2021). The utilisation of Duolingo to enhance the speaking proficiency of EFL secondary school students in Saudi Arabia. *English Language Teaching*, 14(11), 9–15. <https://doi.org/10.5539/elt.v14n11p9>
- Al-Furqon, A. S. (2017). The effect of word search puzzle game in teaching vocabulary to the first grade students of SMPN 3 Proppo. *Wacana Didaktika*, 5(2), 101–108. <https://doi.org/10.31102/wacanadidaktika.5.02.101-108>
- Alghameeti, A. A. (2022). Is TikTok an effective technology tool in English vocabulary expansion? *English Language Teaching*, 15(12), 14–19.

<https://doi.org/10.5539/elt.v15n12p14>

- Alhaisoni, E., & Alhaysony, M. (2017). An investigation of Saudi EFL university students' attitudes towards the use of Google Translate. *International Journal of English Language Education*, 5(1), 72–82. <https://doi.org/10.5296/ijele.v5i1.10696>
- Al-Khazaali, H., Amirian, Z., & Shahnazari, M. (2023). The effect of using Facebook Vocab-Developer on Iraqi EFL learners' vocabulary development. *Russian Law Journal*, XI(7s), 1–13. <https://doi.org/10.52783/rlj.v11i7s.1070>
- Al-Khresheh, M. H., & Al-Ruwaili, S. F. (2020). An exploratory study into vocabulary learning strategies used by Saudi EFL learners. *Journal of History Culture and Art Research*, 9(2), 288–302. <https://dx.doi.org/10.7596/taksad.v9i2.2616>
- Al-Malki, N. S. (2022). Integrating learning strategies for EFL learners' vocabulary enrichment and retention. *Linguistics and Culture Review*, 6(S2), 639–654. <https://doi.org/10.21744/lingcure.v6nS2.2218>
- Almeida, C., Kalinowski, M., Uchoa, A., & Feijo, B. (2023). Negative effects of gamification in education software: Systematic mapping and practitioner perceptions. *Information and Software Technology*, 156, 1–74. <https://doi.org/10.1016/j.infsof.2022.107142>
- Alqahtani, M. (2015a). The importance of vocabulary in language learning and how to be taught. *International Journal of Teaching and Education*, 3(3), 21–34. <https://doi.org/10.20472/TE.2015.3.3.002>
- Alqahtani, M. (2015b). The importance of vocabulary in language learning and how to be taught. *International Journal of Teaching and Education*, 3(3), 21–34. <https://doi.org/10.20472/TE.2015.3.3.002>
- Alsadoon, R. (2021). Chatting with AI Bot: Vocabulary learning assistant for Saudi EFL learners. *English Language Teaching*, 14(6), 135–157.

<https://doi.org/10.5539/elt.v14n6p135>

- Alsaif, A., & Masrai, A. (2019). Extensive reading and incidental vocabulary acquisition: The case of a predominant language classroom input. *International Journal of Education & Literacy Studies*, 7(2), 39–45. <https://dx.doi.org/10.7575/aiac.ijels.v.7n.2p.39>
- Alshumaimeri, Y. (2008). Perceptions and attitudes toward using CALL in English classrooms among Saudi secondary EFL teachers. *The JALT Journal*, 44(2), 29–66. <https://doi.org/10.29140/jaltcall.v4n2.61>
- Altyari, A. W. (2017). English vocabulary uptake by Saudi Arabic speaking students at public schools. *British Journal of English Linguistics*, 5(1), 10–16.
- Antonacci, P. A., & O’Callaghan, C. M. (2012). *Promoting literacy development: 50 research-based strategies for K-8 learners*. SAGE Publications, Inc. <https://doi.org/10.4135/9781452230634>
- Arini, D. N., Hidayat, F., Winarti, A., & Rosalina, E. (2022). Artificial intelligence (AI)-based mobile learning in ELT for EFL learners: The implementation and learners’ attitudes. *International Journal of Educational Studies in Social Sciences (IJESSS)*, 2(2), 88–95.
- Ashcroft, R. J., Garner, J., & Hadingham, O. (2018). Incidental vocabulary learning through watching movies. *Australian Journal of Applied Linguistics*, 1(3), 135–147. <https://dx.doi.org/10.29140/ajal.v1n3.89>
- Aysu, S. (2022). The role of learner autonomy on vocabulary learning. *RumeliDE Dil ve Edebiyat Araştırmaları Dergisi*, 31, 1534–1545. <https://doi.org/10.29000/rumelide.1222355>
- Babacan, N., & Güler, Ç. (2022). The effects of Plickers on English vocabulary achievement, motivation and anxiety. *Education Quarterly Reviews*, 5(2), 617–630. <https://doi.org/10.31014/aior.1993.05.04.648>

- Bahi, H., & Necibi, K. (2020). Fuzzy logic applied for pronunciation assessment. *International Journal of Computer-Assisted Language Learning and Teaching (IJCALLT)*, 10(1), 60–72. <https://doi.org/10.4018/IJCALLT.2020010105>
- Bahrani, M. J., Rad, N. F., & Tajadini, M. (2022). An inquiry on the relationship between self-regulated learning, vocabulary learning and retention among Iranian EFL learners. *Iranian Evolutionary and Educational Psychology Journal*, 4(3), 492–503. <https://doi.org/10.52547/ieepj.4.3.492>
- Bai, L., & Hu, G. (2017). In the face of fallible AWE feedback: How do students respond? *Educational Psychology*, 37, 67–81. <https://doi.org/10.1080/01443410.2016.1223275>
- Bakhsh, S. A. (2016). Using games as a tool in teaching vocabulary to young learners. *English Language Teaching*, 9(7), 120–128. <https://dx.doi.org/10.5539/elt.v9n7p120>
- Bashori, M., Hout, R. van, Strik, H., & Cucchiari, C. (2021). Effects of ASR-based websites on EFL learners' vocabulary, speaking anxiety, and language enjoyment. *System*, 99, 1–16. <https://doi.org/10.1016/j.system.2021.102496>
- Beltran, R. C. (2017). Free-form writing: Computerized feedback for self-correction. *ELT Journal*, 71(2), 141–149.
- Berns, A., Gonzalez-Pardo, A., & Camacho, D. (2013). Game-like language learning in 3-D virtual environments. *Computers and Education*, 60(1), 210–220. <https://doi.org/10.1016/j.compedu.2012.07.001>
- Bilgin, R., & Bingöl, M. (2022). Intentional vocabulary learning vs incidental vocabulary learning for beginner students: Tishk International University Preparatory School case. *Canadian Journal of Language and Literature Studies*, 2(3), 54–71. <https://doi.org/10.53103/cjlls.v2i3.49>

- Binh, N. G., & Chau, V. N. B. (2023). The investigation on recent applications of artificial intelligence in second language acquisition. *AIJR Proceedings*, 200–209. <https://doi.org/10.21467/proceedings.150.22>
- Borschovetska, V., Molotkina, Y., Vitomska, N., Serhiienko, I., & Turitsyna, O. (2022). Overcoming vocabulary-related anxieties in students when communicating in the media internationally. *International Journal of Educational Methodology*, 8(3), 431–447. <https://doi.org/10.12973/ijem.8.3.431>
- Brooks, G., Clenton, J., & Fraser, S. (2021). Exploring the importance of vocabulary for English as an additional language learners' reading comprehension. *Studies in Second Language Learning and Teaching*, 11(3), 351–376. <https://doi.org/10.14746/ssllt.2021.11.3.3>
- Calvo-Ferrer, J. R., & Belda-Medina, J. (2021). The effect of multiplayer video games on incidental and intentional L2 vocabulary learning: The case of among us. *Multimodal Technologies and Interaction*, 5(80), 1–16. <https://doi.org/10.3390/mti5120080>
- Calvo-Ferrer, J. R., & Medina, J. B. (2021). The effect of multiplayer video games on incidental and intentional L2 vocabulary learning: The case of among us. *Multimodal Technologies and Interaction*, 5(80), 1–16. <https://doi.org/10.3390/mti5120080>
- Cameron, L. (2001a). *Teaching languages to young learners*. Cambridge University Press.
- Cameron, L. (2001b). *Teaching languages to young learners*. Cambridge University Press.
- Cao, S., & Liu, F. (2022). Learning to play: Understanding in-game tutorials with a pilot study on implicit tutorials. *Heliyon*, 8(11), 1–9. <https://doi.org/10.1016/j.heliyon.2022.e11482>
- Castillo, L., & Quinonez, A. (2022). Using digital comics for enhancing EFL

- vocabulary learning during the covid-19 pandemic. *International Journal of Learning, Teaching and Educational Research*, 21(5), 478–491. <https://doi.org/10.26803/ijlter.21.5.24>
- Chen, Y. L. (2016). The effects of virtual reality learning environment on student cognitive and linguistic development. *The Asia-Pacific Education Researcher*, 25(4), 637–646. <https://doi.org/10.1007/s40299-016-0293-2>
- Chuang, T. Y., & Kuo, M. S. (2016). A motion-sensing game-based therapy to foster the learning of children with sensory integration dysfunction. *Journal of Educational Technology and Society*, 19(1), 4–16. <https://doi.org/10.1007/s11423-016-9505-y>
- Clark, D. (2018). *To Siri with love- how chatbots are becoming social companions and teachers*. <https://donaldclarkplanb.blogspot.com/2018/06/social-learning-and-chatbots.html>
- Cornillie, F., Thorne, S. L., & Desmet, P. (2012). ReCALL special issue: Digital games for language learning: Challenges and opportunities: Editorial digital games for language learning: From hype to insight? *ReCALL*, 24(3), 243–256. <https://doi.org/10.1017/S0958344012000134>
- Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (4th ed.). SAGE Publication.
- Csikszentmihalyi, M., & Davis, M. S. (1975). *Beyond boredom and anxiety* (1st ed.). Jossey-Bass.
- Dai, Y., & Wu, Z. (2023). Mobile-assisted pronunciation learning with feedback from peers and/or automatic speech recognition: A mixed-methods study. *Computer Assisted Language Learning*, 36(5–6), 861–884. <https://doi.org/10.1080/09588221.2021.1952272>
- Demirbilek, M., & Talan, T. (2022). An examination of the factors and challenges to adopting gamification in English foreign language teaching.

International Journal of Technology in Education, 5(4), 654–668.
<https://doi.org/10.46328/ijte.358>

Deterding, S., Dixon, D., Khaled, D., & Nacke, L. (2011, September 28). From game design elements to gamefulness: Defining gamification. *Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments*.

Dhand, H. (1990). *Techniques of teaching*. APH Publishing.

Diaz, D. G., Perez, M. J. S., Ramirez, E. R., & Aristega, J. M. (2022). Case Study: Gamification as a strategy for vocabulary learning in university students. *Ciencia Latina Revista Multidisciplinar*, 6(6), 7992–8005.
https://doi.org/10.37811/cl_rcm.v6i6.3970

Dizon, G. (2017). Using intelligent personal assistants for second language learning: A case study of Alexa. *TESOL Journal*, 8(4), 811–830.
<https://doi.org/10.1002/tesj.353>

Dizon, G. (2020). Evaluating intelligent personal assistants for L2 listening and speaking development. *Language Learning & Technology*, 24(1), 16–26.
<https://doi.org/10125/44705>

Doherty, S., & Kenny, D. (2014). The design and evaluation of a statistical machine translation syllabus for translation students. *The Interpreter and Translator Trainer*, 8(2), 295–315.
<https://doi.org/10.1080/1750399X.2014.937571>

Elekaei, A. (2019). Investigating the effects of EFL learners' vocabulary gain and retention levels on their choice of memory and compensation strategies in an e-learning project. *CALL-EJ*, 20(2), 1–18.

Elimat, A. K., & AbuSeileek, A. (2014). Automatic speech recognition technology as an effective means for teaching pronunciation. *The JALT CALL Journal*, 10(1), 21–47. <https://doi.org/10.29140/jaltcall.v10n1.166>

- Esmaeili, Z., & Shahrokhi, M. (2020). The impact of Memrise application on Iranian EFL learners' collocation learning and retention. *International Journal of Language Education*, 4(2), 221–233. <https://doi.org/10.26858/ijole.v4i2.10672>
- Evafaliyanti, & Usmawita. (2019). The effectiveness of Mr Dhanis's video on Instagram toward students' vocabulary mastery. *Intensive Journal*, 2(2), 87–61.
- Feng, R., Alsager, H. N., Azizi, Z., & Sarabani, L. (2023). Impact of mind-mapping technique on EFL learners' vocabulary recall and retention, learning motivation, and willingness to communicate. *Heliyon*, 9, 1–13.
- Forsyth, C. M., Luce, C., Zapata-Rivera, D., Jackson, G. T., Evanini, K., & So, Y. (2019). Evaluating English language learners' conversations: Man vs. Machine. *Computer Assisted Language Learning*, 32(4), 398–417. <https://doi.org/10.1080/09588221.2018.1517126>
- Fryer, L. K., Nakao, K., & Thompson, A. (2019). Chatbot learning partners: Connecting learning experiences, interests, and competence. *Computers in Human Behavior*, 93, 279–289. <https://doi.org/10.1016/j.chb.2018.12.023>
- Galaczi, E., & Taylor, L. (2018). Interactional competence: Conceptualisations, operationalisations, and outstanding questions. *Language Assessment Quarterly*, 15(3), 219–236. <https://doi.org/10.1080/15434303.2018.1453816>
- Gao, J. (2021). Exploring the feedback quality of an automated writing evaluation system Pigai. *International Journal of Emerging Technologies in Learning*, 16(11), 322–330. <https://doi.org/10.3991/ijet.v16i11.19657>
- Gardner, D. (2013). *Exploring vocabulary: Language in action*. Routledge.
- Genç Ersoy, B., & Belet Boyacı, Ş. D. (2021). Devising gamification for vocabulary development and motivation: An experimental, mixed-model study. *International Technology and Education Journal*, 5(1), 32–49.

- Ghafar, Z. N., Salh, H. F., Abdulrahim, M. A., Farxha, S. S., Arf, S. F., & Rahim, R. I. (2023). The role of artificial intelligence technology on English language learning: A literature review. *Canadian Journal of Language and Literature Studies*, 3(2), 17–31.
- Ghazal, L. (2007). Learning vocabulary in EFL contexts through vocabulary learning strategies. *NOVITAS-ROYAL*, 1(2), 84–91.
- Goundar, P. R. (2019). Vocabulary learning strategies (VLSs) employed by learners of English as a foreign language (EFL). *English Language Teaching*, 12(5), 177–189. <https://doi.org/10.5539/elt.v12n5p177>
- Gozcu, E., & Caganaga, C. K. (2016). The importance of using games in EFL classrooms. *Cypriot Journal of Educational Sciences*, 11(3), 126–135.
- Graves, K. (2000). *Designing language courses: A guide for teachers*. Heinle and Heinle Publishers.
- Graves, M. F., August, D., & Mancilla- Martinez, J. (2013). *Teaching vocabulary to English language learners*. Teachers College Press.
- Hammad Al-Rashidi, A., Vadivel, B., Ramadan Khalil, N., & Basim, N. (2023). The comparative impacts of portfolio-based assessment, self-assessment, and scaffolded peer assessment on reading comprehension, vocabulary learning, and grammatical accuracy: Insights from working memory capacity. *Language Testing in Asia*, 13(24), 1–38. <https://doi.org/10.1186/s40468-023-00237-1>
- Hanus, M. D., & Fox, J. (2015). Assessing the effects of gamification in the classroom: A longitudinal study on intrinsic motivation, social comparison, satisfaction, effort, and academic performance. *Computers and Education*, 80, 152–161. <http://dx.doi.org/10.1016/j.compedu.2014.08.019>
- Harbord, C., Dempster, E., & Jayemanne, D. (2021). The use of avatars in digital role-playing games (RPGs) in computer-assisted language learning. In M. Peterson, K. Yamazaki, & M. Thomas (Eds.), *Digital games and*

- language learning: Theory, development and implementation* (1st ed., pp. 137–162). Bloomsbury Academic. <https://doi.org/10.5040/9781350133037>
- Haristiani, N. (2019, March 13). Artificial intelligence (AI) chatbot as language learning medium: An inquiry. *International Conference on Education, Science and Technology* 2019. <https://doi.org/10.1088/1742-6596/1387/1/012020>
- Harmer, J. (2007). *The practice of English language teaching*. Pearson Longman.
- Hashemi, A. (2021). The effects of using games on teaching vocabulary in reading comprehension: A case of gifted students. *Journal for the Education of Gifted Young Scientists*, 9(2), 151–160. <http://dx.doi.org/10.17478/jegys.846480>
- Heift, T., & Schulze, M. (2007). Errors and intelligence in computer-assisted language learning: Parsers and pedagogues. *Computational Linguistics*, 34(1), 1–283.
- Hendra. (2018). English vocabulary improvement of a young gamer in Kota Serang (A case study analysis). *TESOL International Journal*, 13(3), 78–87.
- Hiebert, E. H., & Kamil, M. L. (Eds.). (2005). *Teaching and learning vocabulary: Bringing research to practice* (1st ed.). Routledge.
- Hill, A. C. (2022). The effectiveness of mnemonic devices for ESL vocabulary retention. *English Language Teaching*, 15(4), 6–15. <https://doi.org/10.5539/elt.v15n4p6>
- Holmes, W., & Tuomi, I. (2022). State of the art and practice in AI in education. *European Journal of Education*, 57(4), 542–570. <https://doi.org/10.11/ejed.12533>
- Hong, Z.-W., Huang, Y.-M., Hsu, M., & Shen, W.-W. (2016). Authoring robot-

assisted instructional materials for improving learning performance and motivation in EFL classrooms. *Educational Technology & Society*, 19(1), 337–349.

Hovsepyan, T. (2022, June 13). *AI integration in language learning*. <https://plat.ai/blog/ai-integration-in-language-learning/>

Howard, H.-J. C., Christine, T.-Y. Y., & Kyle, K.-W. L. (2023). Investigating college EFL learners' perceptions toward the use of Google Assistant for foreign language learning. *Interactive Learning Environments*, 31(3), 1335–1350. <https://doi.org/10.1080/10494820.2020.1833043>

Hsu, H. (2018). Incidental professional vocabulary acquisition of EFL business learners: Effect of captioned video with glosses. *The JALT CALL Journal*, 14(2), 119–142.

Huang, J. W.-T. (2023). An investigation of EFL nursing students' vocabulary learning strategies (VLS) for medical terminology acquisition. *Taiwan Journal of TESOL*, 20(1), 115–142. [https://doi.org/10.30397/TJTESOL.202304_20\(1\).0004](https://doi.org/10.30397/TJTESOL.202304_20(1).0004)

Hung, C.-Y., Lin, Y.-R., Huang, K.-Y., Yu, P.-T., & Sun, J. C.-Y. (2017). Collaborative game-based learning with motion-sensing technology: Analyzing students' motivation, attention, and relaxation levels. *International Journal of Online Pedagogy and Course Design (IJOPCD)*, 7(4), 1–12. <https://doi.org/10.4018/IJOPCD.2017100104>

Hutauruk, B. S. (2015). Children first language acquisition at age1-3 years old in Balata. *IOSR Journal of Humanities and Social Science*, 20(8), 51–57. <https://doi.org/10.14746/ssllt.2021.11.3.3>

Ibna Seraj, P. M., & Habil, H. (2019, October 17). A critical review on oral English communication skills (OECS). *3rd International Language and Tourism Journal*.

Irzawati, I. (2023). The integration of Duolingo into EFL learning. *ESTEEM:*

- Journal of English Study Programme*, 6(2), 328–337.
<https://doi.org/10.31851/esteem.v6i2.12317>
- Jaftha, N., Zahra-Micallef, M., & Chircop, T. (2021). The impact of gamified instruction on students' learning outcomes: Systematic review of experimental studies. *International Journal of Education*, 13(4), 55–85.
<https://doi.org/10.5296/ije.v13i4.19193>
- Jiang, R. (2022). How does artificial intelligence empower EFL teaching and learning nowadays? A review on artificial intelligence in the EFL context. *Frontiers in Psychology*, 13, 1–8.
<https://doi.org/10.3389/fpsyg.2022.1049401>
- Kacetl, J., & Klimova, B. (2019). Use of smartphone applications in English language learning: A challenge for foreign language education. *Education Sciences*, 9(3), 1–9. <https://doi.org/10.3390/educsci9030179>
- Kaoropthai, C., Natakatoong, O., & Cooharajanone, N. (2019). An intelligent diagnostic framework: A scaffolding tool to resolve academic reading problems of Thai first-year university students. *Computers & Education*, 128, 132–144. <https://doi.org/10.1016/j.compedu.2018.09.001>
- Kartal, E. (2019). The artificial neural network modeling of language learning challenges of French-speaking students learning Turkish as a foreign language : The case of France. *Educational Sciences Theory & Practice*, 19(1), 55–77.
- Kasepalu, R., Prieto, L. P., Ley, T., & Chejara, P. (2022). Teacher artificial intelligence-supported pedagogical actions in collaborative learning coregulation: A wizard of Oz study. *Frontiers in Education*, 7, 1–15.
<https://doi.org/10.3389/educ.2022.736194>
- Katamba, C. V. (2022). Vocabulary enhancement through multimedia learning among grade 7th EFL students. *MEXTESOL Journal*, 46(1), 1–13.
- Katsarou, E., & Kambakis-Vougiouklis. (2022). Delving into the use of L2

vocabulary learning strategies by Greek ESP university students and the role of self-esteem. *Selected Papers of ISTAL*, 24, 460–476. <https://doi.org/10.26262/istal.v24i0.9199>

Kazu, İ. Y., & Kuvvetli, M. (2023). The influence of pronunciation education via artificial intelligence technology on vocabulary acquisition in learning English. *International Journal of Psychology and Educational Studies*, 10(2), 480–493.

Khaleel, F. L., Ashaari, N. S., Ismail, A., & Tengku, S. M. T. W. (2016). The architecture of dynamic gamification elements based learning content. *Journal of Convergence Information Technology*, 11(3), 164–177.

Khenissi, M. A., Essalmi, F., Jemni, M., & Kinshuk, D. (2016). Relationship between learning styles and genres of games. *Computers and Education*, 101, 1–14. <https://doi.org/10.1016/j.compedu.2016.05.005>

Kiasi, G. A., & Gilakjani, A. P. (2023). The effects of definitional, sentential, and textual vocabulary learning strategies on Iranian EFL learners' vocabulary learning and retention. *Reading & Writing Quarterly*, 39(2), 155–172. <https://doi.org/10.1080/10573569.2022.2073575>

Kim, H., Cha, Y., & Kim, N. (2020). Impact of mobile interactions with AI on writing performance. *Modern English Education*, 21(2), 1–13. <https://doi.org/10.18095/meeso.2020.21.2.1>

Kim, M., Crossley, S. A., & Kyle, K. (2018). Lexical sophistication as a multidimensional phenomenon: Relations to second language lexical proficiency, development, and writing quality. *The Modern Language Journal*, 102(1), 120–141.

Kim, N., Y., C., & Hea-Suk, K. (2019). Future English learning: Chatbots and artificial intelligence. *Multimedia-Assisted Language Learning*, 22, 32–53.

Kılıç, M. (2019). Vocabulary knowledge as a predictor in writing and speaking: A case study of Turkish EFL Learners. *PASAA*, 57, 133–164.

- Knowles, M. S. (1980). *The modern practice of adult education: From pedagogy to andragogy*. Cambridge.
- Krashen, S. (1989). We acquire vocabulary and spelling by reading: Additional evidence for the Input Hypothesis. *The Modern Language Journal*, 73(4), 440–463. <https://doi.org/10.1111/j.1540-4781.1989.tb05325.x>
- Kusumadewi, H., & Widyastuti, M. (2018). The effects of using Duolingo towards students' vocabulary mastery. *IJET (Indonesian Journal of English Teaching)*, 7(2), 172–186.
- Lai, K.-W. K., & Chen, H.-J. H. (2023). A comparative study on the effects of a VR and PC visual novel game on vocabulary learning. *Computer Assisted Language Learning*, 36(3), 312–345. <https://doi.org/10.1080/09588221.2021.1928226>
- Lam, S. L. (2014). Use of gamification in vocabulary learning: A case study in Macau. *Center for English Language Communication*, 13, 90–97.
- Laufer, B., & Hulstijn, J. (2001). Incidental vocabulary acquisition in a second language: The construct of task-induced involvement. *Applied Linguistics*, 22(1), 1–26. <https://doi.org/10.1093/applin/22.1.1>
- Lee, S.-M. (2020). The impact of using machine translation on EFL students' writing. *Computer Assisted Language Learning*, 33(2), 1–19. <https://doi.org/10.1080/09588221.2018.1553186>
- Lee, Y., & Cho, J. (2020). Design of a foreign language conversation learning system using machine learning. *Int'l Journal of Innovation, Creativity, and Change*, 13(4), 235–247.
- Li. (2023). Research and analysis of 3D games. *Highlights in Science, Engineering and Technology*, 31, 132–138. <https://doi.org/10.54097/hset.v31i.4825>
- Li, R. (2021). Does game-based vocabulary learning APP influence Chinese

- EFL learners' vocabulary achievement, motivation, and self-confidence? *SAGE Open*, 11(1), 1–12. <https://doi.org/10.1177/21582440211003092>
- Lin, H. (2015). Effectiveness of interactivity in a web-based simulation game on foreign language vocabulary learning. *Procedia- Social and Behavioral Sciences*, 182(3), 313–317. <https://doi.org/10.1016/j.sbspro.2015.04.772>
- Liu, J., Shindo, H., & Matsumoto, Y. (2019). Development of a computer-assisted Japanese functional expression learning system for Chinese-speaking learners. *Educational Technology Research and Development*, 67(5), 1307–1331. <https://doi.org/10.1007/s11423-019-09669-0>
- Liu, X., Wu, D., Ye, Y., Xu, M., Jiao, J., & Lin, W. (2020). Improving accuracy in imitating and reading aloud via speech visualization technology. *International Journal of Emerging Technologies in Learning*, 15(8), 144–160. <https://doi.org/10.3991/ijet.v15i08.11475>
- Long, M. H. (1981). Input, interaction, and second language acquisition. *The New York Academy of Sciences*, 379(1), 259–278. <https://doi.org/10.1111/j.1749-6632.1981.tb42014.x>
- Mahvish, M. M., Iqbal, M. N., Zaman, M. S., & Ali, S. (2023). Relationship between self-esteem and level of vocabulary of students in English at elementary level. *Voyage Journal of Educational Sciences (VJES)*, 3(2), 31–49. <https://doi.org/10.58622/vjes.v3i2.45>
- Manuhutu, M. A., Manurung, T., Uktolseja, L. J., Tindage, J., & Pakaila, B. (2020). The effectiveness of Novo learning system and self directed learning toward the English ability of non-English program students. *International Journal of Computer Applications*, 176(22), 21–28. <https://doi.org/10.5120/ijca2020920205>
- McCafferty, S. G., Roebuck, R. F., & Wayland, R. P. (2001). Activity theory and the incidental learning of a second-language vocabulary. *Language Awareness*, 10(4), 289–294. <https://doi.org/10.1080/09658410108667040>

- McCrocklin, S. M. (2016). Pronunciation learner autonomy: The potential of Automatic Speech Recognition. *System*, 57, 25–42. <https://doi.org/10.1016/j.system.2015.12.013>
- Meara, P. (1980). Vocabulary acquisition: A neglected aspect of language learning. *Language Teaching and Linguistics Abstracts*, 13, 221–246.
- Mecartty, F. (2000). Lexical and grammatical knowledge in reading and listening comprehension by foreign language speakers of Spanish. *Applied Language Learning*, 11(2), 323–348.
- Mehrotra, D. D. (2019). *Basics of artificial intelligence and machine learning*. Notion Press.
- Merzifonluoglu, A., & Takkac Tulgar, A. (2022). Are digital technologies effective for the improvement of L2 vocabulary at tertiary level? *The Reading Matrix: An International Online Journal*, 22(1), 56–72.
- Meşe, C., & Dursun, Ö. Ö. (2018). Influence of gamification elements on emotion, interest and online participation. *Education and Science*, 43(196), 67–95. <https://dx.doi.org/10.15390/EB.2018.7726>
- Mohammadzadeh, A., & Sarkhosh, M. (2018). The effects of self-regulatory learning through computer-assisted intelligent tutoring system on the improvement of EFL learners' speaking ability. *International Journal of Instruction*, 11(2), 167–184. <https://doi.org/10.12973/iji.2018.11212a>
- Moussalli, S., & Cardoso, W. (2020). Intelligent personal assistants: Can they understand and be understood by accented L2 learners? *Computer Assisted Language Learning*, 33(8), 865–890. <https://doi.org/10.1080/10494820.2020.1833043>
- Moustroufas, N., & Digalakis, V. (2007). Automatic pronunciation evaluation of foreign speakers using unknown text. *Computer Speech & Language*, 21(1), 219–230. <https://doi.org/10.1016/j.csl.2006.04.001>

- Murtaza, M., Ahmed, Y., Shamsi, J., Sherwani, F., & Usman, M. (2022). AI-based personalized e-learning systems: Issues, challenges, and solutions. *IEEE Access*, 10, 81323–81342. <https://doi.org/10.1109/ACCESS.2022.3193938>
- Naik, N. (2014, October). A comparative evaluation of game-based learning: Digital or non-digital games? *European Conference on Games Based Learning*.
- Nasution, A. (2022). The effect of Memrise application on students' vocabulary mastery at seventh grade of MTs PAB 1 Helvetia. *Bright Vision: Journal of Language and Education*, 2(1), 32–44.
- Nation, I. S. P. (2006). How large a vocabulary is needed for reading and listening? *Canadian Modern Language Review*, 63(1), 59–82.
- Na-Young, K. (2020). *Chatbots and language learning: Effects of the use of AI chatbots for EFL learning*. Eliva Press.
- Neuman, S. B., & Dwyer, J. (2009). Missing in action: Vocabulary instruction in Pre-K. *The Reading Teacher*, 62(5), 384–392.
- Njoroge, M. C., Ndung'u, R. W., & Gathigia, M. (2013). The use of crossword puzzles as a vocabulary learning strategy: A case of English as a second language in Kenyan secondary schools. *International Journal of Current Research*, 5(2), 313–321.
- Nourdad, N., & Banagozar, M. A. (2022). The effect of e-portfolio assessment on EFL vocabulary learning and retention. *Indonesian Journal of Applied Linguistics*, 12(2), 466–475. <https://doi.org/10.17509/ijal.v12i2.44232>
- Ortega, L. (2013). *Understanding Second Language Acquisition*. Routledge.
- Oxford, R. L. (1990a). *Language learning strategies: What every teacher should know*. Newbury House Publisher.

- Oxford, R. L. (1990b). *Language learning strategies: What every teacher should know* (1st ed.). Heinle & Heinle.
- Panmei, B., & Waluyo, B. (2023). The pedagogical use of gamification in English vocabulary training and learning in higher education. *Education Sciences*, 13(1), 1–22. <https://doi.org/10.3390/educsci13010024>
- Pham, Nguyen, T. T. V., & Cao, T. X. T. (2023). Vietnamese students' perceptions of utilizing social media to enhance English vocabulary: A case study at Van Lang University. *International Journal of TESOL & Education*, 3(1), 79–111. <https://doi.org/10.54855/ijte.23316>
- Pham, T. K. O., & Dang, T. T. D. (2022). Using flashcard games to enhance vocabulary acquisition for high school students. *International Journal of Scientific and Research Publications*, 12(1). <https://dx.doi.org/10.29322/IJSRP.12.01.2022.p12143>
- Picard, R. D. (1997). *Affective Computing*. MIT Press.
- Popenici, S. A. D., & Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. *Research and Practice in Technology Enhanced Learning*, 12(22), 1–13. <https://doi.org/10.1186/s41039-017-0062-8>
- Prasetyo, G. A., Martono, & Suparno. (2018). The use of Rosetta Stone as teaching media to improve students' vocabulary mastery. *English Education Journal*, 6(3), 304–311.
- Pratt, D. D. (1993). Andragogy after twenty-five years. *New Directions for Adult and Continuing Education*, 1993(57), 15–23. <https://doi.org/10.1002/ace.36719935704>
- Prensky, M. (2007). *Digital game-based learning*. Paragon House.
- Putri, E. (2022). An impact of the use Instagram application towards students' vocabulary. *Jurnal Pustaka Ilmu*, 2(2), 1–10.

- Qasim, A. (2021). Impact of digital games on incidental vocabulary acquisition of Pakistani High school students. *Asian EFL Journal Research Articles*, 28(1), 206–224.
- Quynh, P. T. (2022). Maximizing vocabulary retention with gamification tools. *Scientific Journal of Tan Trao University*, 8(4), 5–15.
- Rahayu, E. M., & Bhaskoro, P. (2022). The interactive media Edpuzzle and its implementation in teaching vocabulary in new normal era. *Journal of English Language Teaching*, 9(1), 1–12. <https://doi.org/10.33394/joelt.v9i1.4425>
- Razali, N. N. F. M., & Ismail, R. (2017). The use of simulation and role-play in enhancing speaking skills in learning English language. *Journal of Education and Social Sciences*, 6(2), 72–78.
- Read, J. (2000). *Assessing vocabulary*. Cambridge University Press.
- Rezai, A., Rahul, D. R., Asif, M., Omar, A., & Jamalyar, A. R. (2022). Contributions of e-portfolios assessment to developing EFL learners' vocabulary, motivation, and attitudes. *Hindawi Education Research International*, 2022, 1–11. <https://doi.org/10.1155/2022/5713278>
- Richards, J. C., & Rodgers, T. S. (2014). *Approaches and methods in language teaching* (3rd ed.). Cambridge University Press.
- Ritonga, M., Tazik, K., Omar, A., & Dehkord, E. S. (2022). Assessment and language improvement: The effect of peer assessment (PA) on reading comprehension, reading motivation, and vocabulary learning among EFL learners. *Language Testing in Asia*, 12(36), 1–17. <https://doi.org/10.1186/s40468-022-00188-z>
- Roebuck, R. (1998). *Reading and recall in L1 and L2: A sociocultural approach*. Ablex Publishing Co.
- Roever, C., & Kasper, G. (2018). Speaking in turns and sequences: Interactional

- competence as a target construct in testing speaking. *Language Testing*, 35(3), 331–355. <https://doi.org/10.1177/0265532218758128>
- Rukiati, E., Wicaksono, J. A., Taufan, G. T., & Suharsono, D. D. (2023). AI on learning English: Application, benefit, and threat. *Journal of Language, Communication and Tourism*, 1(2), 32–40. <https://doi.org/10.25047/jlct.v1i2.3967>
- Sadeghi, K., & Farzizadeh, B. (2013). The effect of visually supported vocabulary instruction on beginner EFL learners. *MEXTESOL Journal*, 37(1), 1–12.
- Saleh, A. M., & Althaqafi, A. (2022). The effect of using educational games as a tool in teaching English vocabulary to Arab young children: A quasi-experimental study in a kindergarten school in Saudi Arabia. *SAGE Open*, 12(1), 1–10. <https://doi.org/10.1177/21582440221079806>
- Sanosi, A. B. (2018). The effect of Quizlet on vocabulary acquisition. *Asian Journal of Education and E-Learning*, 6(4), 71–77. <https://doi.org/10.24203/ajeel.v6i4.5446>
- Schmidt, T., & Strasser, T. (2022). Artificial intelligence in foreign language learning and teaching. *Anglistic: International Journal of English Studies*, 33(1), 165–184. <https://doi.org/10.33675/ANGL/2022/1/14>
- Schmitt, N. (2000). *Vocabulary in language teaching* (1st ed.). Cambridge University Press.
- Seli, F. Y., & Santosa, I. (2022). The role of video games in learning English. *IJLECR (International Journal of Language Education and Cultural Review)*, 8(2), 56–67. <https://doi.org/10.21009/ijlecr.v8i2.32013>
- Seliger, H. W., & Shohamy, E. (1989). *Second language research methods*. Oxford University Press.
- Şenel, M., & Akman, D. B. (2016). Fun teaching! Fun tech-ing! Interactive

- educational games for young learners. *Participatory Educational Research*, 2016(1), 12–21. <http://dx.doi.org/10.17275/per.16.spi.1.2>
- Shamsan, M. A. A., Ali, J. K. M., & Hezam, T. A. (2021). Online learning amid Covid-19 pandemic: A case study of vocabulary learning strategies. *Arab World English Journal*, 1, 281–294.
- Sheldon, L. (2020). *The multiplayer classroom: Designing coursework as a game* (2nd ed.). CRC Press. <https://doi.org/10.1201/9780429285035>
- Shin, H. W., Sok, S., & Do, J. (2023). Role of individual differences in incidental L2 vocabulary acquisition through listening to stories: Metacognitive awareness and motivation. *International Review of Applied Linguistics in Language Teaching*, 61(4), 1669–1695. <https://doi.org/10.1515/iral-2021-0212>
- Sindermann, C., Sha, P., Zhou, M., Wernicke, J., Schmitt, H. S., Li, M., Sariyska, R., Stavrou, M., Becker, B., & Montag, C. (2021). Assessing the attitude towards artificial intelligence: Introduction of a short measure in German, Chinese, and English language. *KI- Künstliche Intelligenz*, 35, 109–118. <https://doi.org/10.1007/s13218-020-00689-0>
- Stephenson, P., & Rumley, G. (2005). Inclusive work at a European level: A case study. *Support for Learning*, 20(3), 141–145. <https://doi.org/10.1111/j.0268-2141.2005.00378.x>
- Subon, F. (2013). Vocabulary learning strategies employed by form 6 students. *International Journal of Scientific and Research Publications*, 3(6), 1–32.
- Suendermann-Oeft, D., Ramanarayanan, V., Yu, Z., Qian, Y., Evanini, K., Lange, P., Wang, X., & Zechner, K. (2017). *A multimodal dialog system for language assessment: Current state and future directions*. <https://doi.org/10.1002/ets2.12149>
- Sumakul, D. T. Y. G., Hamied, F. A., & Sukyadi, D. (2022). Artificial intelligence in EFL classrooms: Friend or foe? *LEARN Journal: Language*

Education and Acquisition Research Network, 15(1), 232–256.

- Suryana, I., Asrianto, A., & Murwantono, D. (2020). Artificial intelligence to master English listening skills for non-English major students. *Journal of Languages and Language Teaching*, 8(1), 48–59. <https://doi.org/10.33394/jollt.v8i1.2221>
- Sutami, N. K. (2021). The use of Orai mobile application to teach speaking in EFL classes. *Journal of English Language Learning (JELL)*, 5(2), 149–153. <https://doi.org/10.31949/jell.v5i2.3362>
- Swain, M. (2000). *The output hypothesis and beyond: Mediating acquisition through collaborative dialogue* (J. P. Lantolf, Ed.). Oxford University Press.
- Syafrizal, S., & Septiawati, T. (2022). Enhancing listening skills of EFL Indonesian learners through Busuu application. *International Journal of English Language and Literature Studies*, 11(3), 147–154. <https://doi.org/10.55493/5019.v11i3.4615>
- Sze-to, H. Y., & Jung, J. (2022). Incidental lexical learning from single-player video game. *English Language Assessment*, 17(1), 131–151. <https://doi.org/10.37244/ela.2022.17.1.131>
- Tai, T.-Y. (2022). Effects of intelligent personal assistants on EFL learners' oral proficiency outside the classroom. *Computer Assisted Language Learning*, 1–30. <https://doi.org/10.1080/09588221.2022.2075013>
- Tanaka, M. (2022). The role of self-construal in EFL vocabulary learning. *International Review of Applied Linguistics in Language Teaching*, 60(3), 883–908. <https://doi.org/10.1515/iral-2019-0082>
- Tang, J., Foley, & Joseph. (2022). A case study on the effectiveness of applying content and language integrated learning in an artificial intelligence English reading course. *Arab World English Journal*, 13(3), 236–253.

- Tang, L., & Lim, J. (2023). Language aptitude in the development of vocabulary breadth and depth of EFL learners with different proficiency levels. *Korean Journal of English Language and Linguistics*, 23, 285–302. <https://doi.org/10.15738/kjell.23..202304.285>
- Tapalova, O., & Zhiyenbayeva, N. (2022). Artificial intelligence in education: AIED for personalized learning pathways. *The Electronic Journal of E-Learning*, 20(5), 639–653.
- Tapia, J. (2021). *Puzzles to foster A1 vocabulary retention in teenagers (Master's Thesis)*. Pontificia Universidad Catolica del Ecuador.
- Tashmuradova, B., Prasad, K. D. V., Abdel Al-İbrahim, K. A., & Sarabani, L. (2023). The comparative effects of consciousness raising tasks and dynamic assessment on morphological awareness: The case of pre-intermediate EFL learners. *Language Testing in Asia*, 13(19), 1–21. <https://doi.org/10.1186/s40468-023-00231-7>
- Tatlı, Z., Saylan, E., & Kokoç, M. (2022). Digital storytelling in an online EFL course: Influences on speaking, vocabulary, and cognitive load. *Participatory Educational Research*, 9(6), 89–112. <https://doi.org/10.17275/per.22.130.9.6>
- Thao, T. M. (2022). The application of mnemonic strategies to improve EFL students' aptitude for vocabulary. *Journal of Nusantara Studies*, 7(2), 166–183. <https://doi.org/10.24200/jonus.vol7iss2pp166-183>
- Thiagarajah, K., Ng, M. M., Jeyaraja, S. S. B., Gunasehgaran, V., & Maniam, M. (2022). Effectiveness of gamification tool in teaching vocabulary. *International Journal of Academic Research in Business and Social Sciences*, 12(9), 1046–1063.
- Thornbury, S. (2002). *How to teach vocabulary* (1st ed.). Pearson Education Limited.
- Thurairasu, V. (2022). Gamification-based learning as the future of language

- learning: An overview. *European Journal of Humanities and Social Sciences*, 2(6), 62–68.
- Tokowicz, N., & MacWhinney, B. (2005). Implicit and explicit measures of sensitivity to violations in second language grammar: An event-related potential investigation. *Studies in Second Language Acquisition*, 27(2), 173–204. <http://doi.org/10.1017/S0272263105050102>
- Tursunova, M. (2022). Introverts vs extroverts: Towards developing vocabulary. *Miasto Przyszlosci*, 25, 205–207.
- Tzu-Yu, T., & Howard, H.-J. C. (2023). The impact of Google Assistant on adolescent EFL learners' willingness to communicate. *Interactive Learning Environments*, 31(3), 1485–1502. <https://doi.org/10.1080/10494820.2020.1841801>
- Vanjani, M., & Aiken, M. (2020). A comparison of free online machine language translators. *Journal of Management Science and Business Intelligence*, 5(1), 26–31. <https://doi.org/10.5281/zenodo.3961085>
- Verga, L., & Kotz, S. A. (2017). Help me if I can't: Social interaction effects in adult contextual word learning. *Cognition*, 168, 76–90. <https://doi.org/10.1016/j.cognition.2017.06.018>
- Vygotsky, L. S. (1980). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Waer, H. (2021). Using gamification in EFL vocabulary learning and learners' attitudes towards gamification use. *Journal of Scientific Research in Education*, 22(2), 547–570.
- Waluyo, B., & Bucol, J. L. (2021). The impact of gamified vocabulary learning using Quizlet on low-proficiency students. *Computer-Assisted Language Learning Electronic Journal*, 22(1), 158–179.
- Wang, Y. F., & Petrina, S. (2013). Using learning analytics to understand the

- design of an intelligent language tutor- Chatbot Lucy. *International Journal of Advanced Computer Science and Applications (IJACSA)*, 4(11), 124–131. <https://doi.org/10.14569/IJACSA.2013.041117>
- Werbach, K., & Hunter, D. (2012). *For the win: How game thinking can revolutionize your business*. Wharton Digital Press.
- Wertsch, J. V. (1979). The regulation of human action and the given-new organization of private speech. In G. Zivin (Ed.), *The development of self-regulation through private speech* (pp. 79–98). Wiley.
- Wertsch, J. V. (1985). *Vygotsky and the social formation of mind*. Harvard University Press.
- Wilkins, D. A. (1972). *Linguistics in language teaching*. Cambridge: MIT Press.
- Woo, J. H., & Choi, H. (2021). Systematic review for AI-based language learning tools. *Journal of Digital Contents Society*, 22(11), 1783–1792. <https://doi.org/10.9728/dcs.2021.22.11.1783>
- Wu, M., Liao, C. C. Y., Chen, Z.-H., & Chan, T.-W. (2010, April 12). Designing a competitive game for promoting students' effort-making behaviour by virtual pets. *International Conference on Digital Game and Intelligent Toy Enhanced Learning*. <https://doi.org/10.1109/DIGITEL.2010.51>
- Wulantari, N. P., Rachman, A., Sari, M. N., Uktolseja, L. J., & Rofi'i, A. (2023). The role of gamification in English language teaching: A literature review. *Journal on Education*, 6(1), 2847–2856.
- Xiao, Y., & Hu, J. (2019a). Assessment of optimal pedagogical factors for Canadian ESL learners' reading literacy through artificial intelligence algorithms. *International Journal of English Linguistics*, 9(4), 1–14. <https://doi.org/10.5539/ijel.v9n4p1>

- Xiao, Y., & Hu, J. (2019b). Assessment of optimal pedagogical factors for Canadian ESL learners' reading literacy through artificial intelligence algorithms. *International Journal of English Linguistics*, 9(4), 1–14. <https://doi.org/10.5539/ijel.v9n4p1>
- Xu. (2010). The effects of glosses on incidental vocabulary acquisition in reading. *Journal of Language Teaching and Research*, 1(2), 117–120. <https://doi.org/10.4304/jltr.1.2.117-120>
- Xu, Z., Wijekumar, K. (Kay), Ramirez, G., Hu, X., & Irey, R. (2019). The effectiveness of intelligent tutoring systems on K-12 students' reading comprehension: A meta-analysis. *British Journal of Educational Technology*, 50(6), 3119–3137. <https://doi.org/10.1111/bjet.12758>
- Yeşil, Ş. (2022). The effects of web 2.0 tools on EFL students' vocabulary knowledge and retention. *ELT Research Journal*, 11(2), 175–192.
- Yıldız, C. (2023). The interplay between Turkish EFL learners' motivation and vocabulary knowledge. *International Journal of Curriculum and Instruction*, 15(2), 838–850.
- Young, R. F. (2011). Interactional competence in language learning, teaching, and testing. In E. Hinkel (Ed.), *Handbook of research in second language teaching and learning* (2nd ed., pp. 426–443). Routledge.
- Yowaboot, C., & Sukying, A. (2022). Using digital flashcards to enhance Thai EFL primary school students' vocabulary knowledge. *English Language Teaching*, 15(7), 61–74. <https://doi.org/10.5539/elt.v15n7p61>
- Yuliani, S., Khulaifayah, & Idayni, A. (2023). The impact of Rosetta Stone on students' pronunciation for English subject. *Pegem Journal of Education and Instruction*, 14(1), 313–318. <https://doi.org/10.47750/pegegog.14.01.35>
- Zafiri, M. (2017). Adapting board games to stimulate motivation in vocabulary learning in six year old learners- A case study. *Journal of Studies in*

Education, 7(3), 1–28. <https://doi.org/10.5296/jse.v7i3.11323>

- Zhai, C., & Wibowo, S. (2023). A systematic review on artificial intelligence dialogue systems for enhancing English as foreign language students' interactional competence in the university. *Computers and Education: Artificial Intelligence*, 4, 1–26. <https://doi.org/10.1016/j.caeai.2023.100134>
- Zhang, & Hasim, Z. (2023). Gamification in EFL/ ESL instruction: A systematic review of empirical research. *Frontiers in Psychology*, 13, 1–12. <http://doi.org/10.3389/fpsyg.2022.1030790>
- Zhang, J., Xie, M., & Wen, B. (2019). Adapting pushing of learning resources in fragmented English reading. *International Journal of Performability Engineering*, 15(3), 884–894. <https://doi.org/10.23940/ijpe.19.03.p17.884894>
- Zohrabi, M., Tadayyon, P., & Dobahkti, L. (2018). The effects of rote and contextualized memorization on Iranian immediate EFL learners' vocabulary development. *Iranian Journal of English for Academic Purposes*, 7(2), 16–31.
- Zou, D., Huang, Y., & Xie, H. (2019). Digital game-based vocabulary learning: Where are we and where are we going? *Computer Assisted Language Learning*, 34(5–6), 751–777. <https://doi.org/10.1080/09588221.2019.1640745>
- Zou, & Yan, X. (2019). Incidental vocabulary acquisition through reading: A review in the last two decades. *English Language Teaching*, 12(12), 39–45. <https://doi.org/10.5539/elt.v12n12p39>

Appendix A

Background Questionnaire and Vocabulary Test

Dear Participant,

You are kindly invited to participate in a survey focusing on the efficacy of AI-Enhanced Gamification for Vocabulary Learning in the EFL Context. Your participation is entirely voluntary. Your answers will be kept confidential and used only for scientific purposes. The survey has two parts: A background questionnaire (4), and Vocabulary Test (60). It takes 40 minutes to complete. Thank you for your participation in the study.

Serdar HOŞER

Background Questionnaire	
Your age:	Your gender: Female (1) Male (2)
Your grade:	Your English Level:

Please read the questions carefully and answer the questions on the next pages.

Vocabulary Test (Pre and Post Test Instrument)



PONTIFICIA UNIVERSIDAD CATÓLICA DEL ECUADOR

Puzzles to foster vocabulary retention in teenagers

PRE-TEST

Instructions:

- Read every statement carefully and choose one answer.

A. Read the statements and put a tick on the answer you think is right.

		avocado	box	house	picture	girl	zoo
1	place a person lives in						
2	big photo in a square						
3	young woman						

		fridge	scissors	expensive	cooker	scarf	key
4	type of clothing for neck						
5	instrument to cut paper						
6	the opposite of cheap						

		kitchen	trainers	square	pet	ugly	sheep
7	something to go running						
8	animal that you own						
9	place for cooking meals						

		tiring	crab	chess	like	mouth	loaf
10	sea animal with big arms						
11	part of body to eat food						
12	game with small pieces						

		offer	healthy	want	help	salt	lorry
13	big means of transport						
14	something nutritious						
15	ingredient for the soup						

		morning	shopping	clean	stories	songs	hobby
16	not dirty						
17	free time activity						
18	buy something outside						

		neighbor	share	worry	ask	sleep	continue
19	take time to rest						
20	keep happening						
21	use together something						

		dance	jump	exercise	sit	stand	run
22	move body with music						
23	go down on a chair						
24	move fast with legs						

		alone	bad	cold	green	loud	main
25	not good						
26	most important						
27	the opposite of hot						

		coach	pie	customer	vehicle	feature	weed
28	someone who buys things						
29	person who trains a team						
30	a special characteristic						

B. Look at the words in bold and choose a, b, or c

31. MAINTAIN: Can they maintain it? a. make it larger. b. keep it as it is. c. get a better one than it 32. STONE: She sat on a stone. a. part of a tree. b. kind of chair. c. hard thing. 33. UPSET: He is upset. a. tired b. unhappy c. famous 34. DRAWER: The drawer was empty. a. sliding box to keep things b. place where cars are kept c. animal house 35. PATIENCE: I don't have patience. a. have no free time b. will not wait happily c. have no faith	36. SCARED: he was scared. a. frightened b. with no fear c. angry 37. CIRCLE: Please make a circle. a. space with nothing in it b. rough picture c. round shape 38. VOCABULARY: He needs vocabulary. a. skills b. words c. money 39. POCKET: I keep it in my pocket. a. food grown in gardens. b. a space ship c. part of trousers to keep coins 40. CAP: I wore this gray cap this morning. a. kind of hat b. cover for letters c. traditional music
--	--

C. Look at the definitions and use the letters to write words.

- | | |
|---|---------------------|
| 41. If you want to stay a night, you can have a room. | h _ _ _ _ |
| 42. They are the main ingredient for French fries. | p _ _ _ _ _ _ |
| 43. Cheese and yoghurt is made of this. | m _ _ _ |
| 44. You may go here, when you are sick. | h _ _ _ _ _ _ |
| 45. You can see colorful pictures and letters in this. | b _ _ _ |
| 46. A girl can wear it at a party. | d _ _ _ _ |
| 47. This has a screen and you can watch programs. | t _ _ _ _ _ _ _ _ |
| 48. You can have a meal here and then pay for it. | r _ _ _ _ _ _ _ _ |
| 49. You use it to draw and write. | p _ _ _ _ _ |
| 50. When it is your birthday, you receive lots of them. | p _ _ _ _ _ _ _ |
| 51. It is played with small pieces on a large board. | c _ _ _ _ _ |
| 52. Women often have it to carry their money in it. | p _ _ _ _ |
| 53. Many boys and girls go here to study | s _ _ _ _ _ |
| 54. You can play soccer with this. | b _ _ _ |
| 55. It is good to take pictures and photos. | c _ _ _ _ _ |
| 56. A group that sing songs in a concert. | b _ _ _ |
| 57. If you want a peach, you use this to buy it. | m _ _ _ _ |
| 58. If you want to buy food, you go to this place | s _ _ _ _ _ _ _ _ _ |
| 59. You open this to come in and come out. | d _ _ _ |
| 60. You take this after learning a lot of a subject. | e _ _ _ |

APPENDIX B

The Ethics Committee Approval



T.C.
İSTANBUL MEDENİYET ÜNİVERSİTESİ REKTÖRLÜĞÜ
Rektörlük



Sayı : E-38510686-050.04-2400017231
Konu : Serdar HOŞER'in Başvurusu

08.03.2024

İlgili Makama,

İMÜ Sosyal ve Beşeri Bilimler Etik Kurulu'nun 2024/2 sayılı ve 27.02.2024 tarihli kararıyla, İMÜ Lisansüstü Eğitim Enstitüsü (İngilizce Dili Eğitimi) yüksek lisans öğrencisi Serdar Hoşer'in "İngilizce'nin Yabancı Dil Olarak Öğrenilmesi Bağlamında Yapay Zeka Destekli Oyunlaştırmanın Kelime Öğrenimine Etkisi (The Efficacy of AI-Enhanced Gamification for Vocabulary Learning in the EFL Learning Context)" başlıklı YL tezi kapsamında (dan. Prof. Dr. Selami Aydın) veri toplanmasına yönelik araştırma dosyası görüşülmüş, içerik bakımından etik bir sorun bulunmadığı sonucuna varılarak izin talebi uygun bulunmuştur.

Prof. Dr. Tuncay BAŞOĞLU
Kurul Başkanı

Belge Doğrulama Kodu: D7MAF77

Bu belge, güvenli elektronik imza ile imzalanmıştır.

Belge Takip Adresi:
<https://ubys.medeniyet.edu.tr/ERMS/Record/ConfirmationPage/Index>

Adres:

Telefon No: (0 216) 2803333

e-Posta:

Kep Adresi: istanbulmedeniyetuni@hs01.kep.tr

Faks No:

İnternet Adresi: www.medeniyet.edu.tr

Bilgi için :

Telefon No:

Direkt Hat:

Tuncay Başoğlu

Öğretim Üyesi



Appendix C

The Wilcoxon Test for the Control Group

Items	Ranks	N	Mean Rank	Sum of Ranks	Asymp. Sig. (2-tailed)
1.Place a person lives in.	Negative Ranks	1 ^a	1.00	1.00	.31
	Positive Ranks	0 ^b	.00	.00	
	Ties	15 ^c			
	Total	16			
2.Big photo in a square.	Negative Ranks	3 ^d	2.00	6.00	.08
	Positive Ranks	0 ^e	.00	.00	
	Ties	13 ^f			
	Total	16			
3.Young woman.	Negative Ranks	2 ^g	2.00	4.00	.56
	Positive Ranks	1 ^h	2.00	2.00	
	Ties	13 ⁱ			
	Total	16			
4.Type of clothing for neck.	Negative Ranks	6 ^j	4.00	24.00	.05
	Positive Ranks	1 ^k	4.00	4.00	
	Ties	9 ^l			
	Total	16			
5.Instrument to cut paper.	Negative Ranks	3 ^m	2.00	6.00	.08
	Positive Ranks	0 ⁿ	.00	.00	
	Ties	13 ^o			
	Total	16			
6.The opposite of cheap.	Negative Ranks	8 ^p	4.50	36.00	.00
	Positive Ranks	0 ^q	.00	.00	
	Ties	8 ^r			
	Total	16			

7. Something to go running.	Negative Ranks	6 ^s	3.50	21.00	.01
	Positive Ranks	0 ^t	.00	.00	
	Ties	10 ^u			
	Total	16			
8. Animal that you own.	Negative Ranks	3 ^v	2.00	6.00	.08
	Positive Ranks	0 ^w	.00	.00	
	Ties	13 ^x			
	Total	16			
9. Place for cooking meals.	Negative Ranks	0 ^y	.00	.00	1.00
	Positive Ranks	0 ^z	.00	.00	
	Ties	16 ^{aa}			
	Total	16			
10. Sea animal with big arms.	Negative Ranks	6 ^{ab}	3.50	21.00	.01
	Positive Ranks	0 ^{ac}	.00	.00	
	Ties	10 ^{ad}			
	Total	16			
11. Part of body to eat food.	Negative Ranks	4 ^{ae}	3.00	12.00	.18
	Positive Ranks	1 ^{af}	3.00	3.00	
	Ties	11 ^{ag}			
	Total	16			
12. Game with small pieces.	Negative Ranks	6 ^{ah}	4.50	27.00	.15
	Positive Ranks	2 ^{ai}	4.50	9.00	
	Ties	8 ^{aj}			
	Total	16			
13. Big means of transport.	Negative Ranks	9 ^{ak}	5.00	45.00	.00
	Positive Ranks	0 ^{al}	.00	.00	
	Ties	7 ^{am}			
	Total	16			
14. Something nutritious.	Negative Ranks	8 ^{an}	5.00	40.00	.02
	Positive Ranks	1 ^{ao}	5.00	5.00	
	Ties	7 ^{ap}			
	Total	16			
15. Ingredient for the soup.	Negative Ranks	6 ^{aq}	5.00	30.00	.31
	Positive Ranks	3 ^{ar}	5.00	15.00	
	Ties	7 ^{as}			
	Total	16			
16. Not dirty.	Negative Ranks	6 ^{at}	3.50	21.00	.01
	Positive Ranks	0 ^{au}	.00	.00	
	Ties	10 ^{av}			
	Total	16			

17.Free time activity.	Negative Ranks	2 ^{aw}	2.50	5.00	1.00
	Positive Ranks	2 ^{ax}	2.50	5.00	
	Ties	12 ^{ay}			
	Total	16			
18.Buy something outside.	Negative Ranks	2 ^{az}	2.00	4.00	.56
	Positive Ranks	1 ^{ba}	2.00	2.00	
	Ties	13 ^{bb}			
	Total	16			
19.Take time to rest.	Negative Ranks	6 ^{bc}	5.00	30.00	.31
	Positive Ranks	3 ^{bd}	5.00	15.00	
	Ties	7 ^{be}			
	Total	16			
20.Keep happening.	Negative Ranks	6 ^{bf}	4.00	24.00	.05
	Positive Ranks	1 ^{bg}	4.00	4.00	
	Ties	9 ^{bh}			
	Total	16			
21.Use together something.	Negative Ranks	6 ^{bi}	4.50	27.00	.15
	Positive Ranks	2 ^{bj}	4.50	9.00	
	Ties	8 ^{bk}			
	Total	16			
22.Move body with music.	Negative Ranks	1 ^{bl}	1.00	1.00	.31
	Positive Ranks	0 ^{bm}	.00	.00	
	Ties	15 ^{bn}			
	Total	16			
23.Go down on a chair.	Negative Ranks	2 ^{bo}	1.50	3.00	.15
	Positive Ranks	0 ^{bp}	.00	.00	
	Ties	14 ^{bq}			
	Total	16			
24.Move fast with legs.	Negative Ranks	1 ^{br}	2.00	2.00	.56
	Positive Ranks	2 ^{bs}	2.00	4.00	
	Ties	13 ^{bt}			
	Total	16			
25.Not good.	Negative Ranks	4 ^{bu}	2.50	10.00	.04
	Positive Ranks	0 ^{bv}	.00	.00	
	Ties	12 ^{bw}			
	Total	16			
26.Most important.	Negative Ranks	7 ^{bx}	4.50	31.50	.03
	Positive Ranks	1 ^{by}	4.50	4.50	
	Ties	8 ^{bz}			
	Total	16			

27.The opposite of hot.	Negative Ranks	3 ^{ca}	2.50	7.50	.31
	Positive Ranks	1 ^{cb}	2.50	2.50	
	Ties	12 ^{cc}			
	Total	16			
28.Someone who buys things.	Negative Ranks	8 ^{cd}	4.50	36.00	.00
	Positive Ranks	0 ^{ce}	.00	.00	
	Ties	8 ^{cf}			
	Total	16			
29.Person who trains a team.	Negative Ranks	5 ^{cg}	3.00	15.00	.02
	Positive Ranks	0 ^{ch}	.00	.00	
	Ties	11 ^{ci}			
	Total	16			
30.A special characteristic.	Negative Ranks	8 ^{cj}	4.50	36.00	.00
	Positive Ranks	0 ^{ck}	.00	.00	
	Ties	8 ^{cl}			
	Total	16			
31.MAINTAIN: Can they maintain it?	Negative Ranks	6 ^{cm}	4.50	27.00	.15
	Positive Ranks	2 ^{cn}	4.50	9.00	
	Ties	8 ^{co}			
	Total	16			
32.STONE: She sat on a stone.	Negative Ranks	5 ^{cp}	4.00	20.00	.25
	Positive Ranks	2 ^{cq}	4.00	8.00	
	Ties	9 ^{cr}			
	Total	16			
33.UPSET: He is upset.	Negative Ranks	14 ^{cs}	8.00	112.00	.00
	Positive Ranks	1 ^{ct}	8.00	8.00	
	Ties	1 ^{cu}			
	Total	16			
34.DRAWER: The drawer was empty.	Negative Ranks	8 ^{cv}	5.00	40.00	.02
	Positive Ranks	1 ^{cw}	5.00	5.00	
	Ties	7 ^{cx}			
	Total	16			
35.PATIENCE: I don't have patience.	Negative Ranks	6 ^{cy}	4.50	27.00	.15
	Positive Ranks	2 ^{cz}	4.50	9.00	
	Ties	8 ^{da}			
	Total	16			
36.SCARED: He was scared.	Negative Ranks	7 ^{db}	4.00	28.00	.00
	Positive Ranks	0 ^{dc}	.00	.00	
	Ties	9 ^{dd}			
	Total	16			

37.CIRCLE: Please make a circle.	Negative Ranks	5 ^{de}	3.50	17.50	.10
	Positive Ranks	1 ^{df}	3.50	3.50	
	Ties	10 ^{dg}			
	Total	16			
38.VOCABULARY: He needs vocabulary.	Negative Ranks	4 ^{dh}	3.00	12.00	.18
	Positive Ranks	1 ^{di}	3.00	3.00	
	Ties	11 ^{dj}			
	Total	16			
39.POCKET: I keep it in my pocket.	Negative Ranks	10 ^{dk}	6.50	65.00	.02
	Positive Ranks	2 ^{dl}	6.50	13.00	
	Ties	4 ^{dm}			
	Total	16			
40.CAP: I wore this gray cap this morning.	Negative Ranks	6 ^{dn}	4.00	24.00	.05
	Positive Ranks	1 ^{do}	4.00	4.00	
	Ties	9 ^{dp}			
	Total	16			
41.If you want to stay a night, you can have a room.	Negative Ranks	6 ^{dq}	4.50	27.00	.15
	Positive Ranks	2 ^{dr}	4.50	9.00	
	Ties	8 ^{ds}			
	Total	16			
42.They are the main ingredients for French fries.	Negative Ranks	2 ^{dt}	2.00	4.00	.56
	Positive Ranks	1 ^{du}	2.00	2.00	
	Ties	13 ^{dv}			
	Total	16			
43.Cheese and yoghurt is made of this.	Negative Ranks	7 ^{dw}	5.00	35.00	.09
	Positive Ranks	2 ^{dx}	5.00	10.00	
	Ties	7 ^{dy}			
	Total	16			
44.You may go here, when you are sick.	Negative Ranks	6 ^{dz}	3.50	21.00	.01
	Positive Ranks	0 ^{ea}	.00	.00	
	Ties	10 ^{eb}			
	Total	16			
45.You can see colorful pictures and letters in this.	Negative Ranks	6 ^{ec}	5.00	30.00	.31
	Positive Ranks	3 ^{ed}	5.00	15.00	
	Ties	7 ^{ee}			
	Total	16			
46.A girl can wear it at a party.	Negative Ranks	5 ^{ef}	3.00	15.00	.02
	Positive Ranks	0 ^{eg}	.00	.00	
	Ties	11 ^{eh}			
	Total	16			

47.This has a screen and you can watch programs.	Negative Ranks	7 ^{ei}	4.00	28.00	.00
	Positive Ranks	0 ^{ej}	.00	.00	
	Ties	9 ^{ek}			
	Total	16			
48.You can have a meal here and then pay for it.	Negative Ranks	4 ^{el}	2.50	10.00	.04
	Positive Ranks	0 ^{em}	.00	.00	
	Ties	12 ^{en}			
	Total	16			
49.You use it to draw and write.	Negative Ranks	5 ^{eo}	3.00	15.00	.02
	Positive Ranks	0 ^{ep}	.00	.00	
	Ties	11 ^{eq}			
	Total	16			
50.When it is your birthday,you receive lots of them.	Negative Ranks	2 ^{er}	1.50	3.00	.15
	Positive Ranks	0 ^{es}	.00	.00	
	Ties	14 ^{et}			
	Total	16			
51.It is played with small pieces on a large board.	Negative Ranks	6 ^{eu}	4.00	24.00	.05
	Positive Ranks	1 ^{ev}	4.00	4.00	
	Ties	9 ^{ew}			
	Total	16			
52.Women often have to carry their money in it.	Negative Ranks	8 ^{ex}	4.50	36.00	.00
	Positive Ranks	0 ^{ey}	.00	.00	
	Ties	8 ^{ez}			
	Total	16			
53.Many boys and girls go here to study.	Negative Ranks	2 ^{fa}	1.50	3.00	.15
	Positive Ranks	0 ^{fb}	.00	.00	
	Ties	14 ^{fc}			
	Total	16			
54.You can play soccer with this.	Negative Ranks	7 ^{fd}	4.00	28.00	.00
	Positive Ranks	0 ^{fe}	.00	.00	
	Ties	9 ^{ff}			
	Total	16			
55.It is good to take picturesand photos.	Negative Ranks	6 ^{fg}	3.50	21.00	.01
	Positive Ranks	0 ^{fh}	.00	.00	
	Ties	10 ^{fi}			
	Total	16			
56.A group that sing songs in a concert.	Negative Ranks	9 ^{fj}	5.00	45.00	.00
	Positive Ranks	0 ^{fk}	.00	.00	
	Ties	7 ^{fl}			
	Total	16			

57.If you want a peach, you use this to buy it.	Negative Ranks	8 ^{fm}	4.50	36.00	.00
	Positive Ranks	0 ^{fn}	.00	.00	
	Ties	8 ^{fo}			
	Total	16			
58.If you want to buy food, you go to this place.	Negative Ranks	12 ^{fp}	6.50	78.00	.00
	Positive Ranks	0 ^{fq}	.00	.00	
	Ties	4 ^{fr}			
	Total	16			
59.You open this to come in and come out.	Negative Ranks	8 ^{fs}	4.50	36.00	.00
	Positive Ranks	0 ^{ft}	.00	.00	
	Ties	8 ^{fu}			
	Total	16			
60.You take this after learning a lot of subject.	Negative Ranks	11 ^{fv}	6.00	66.00	.00
	Positive Ranks	0 ^{fw}	.00	.00	
	Ties	5 ^{fx}			
	Total	16			

APPENDIX D

The Wilcoxon Test for the Control Group

Items	Ranks	N	Mean Rank	Sum of Ranks	Asymp. Sig. (2-tailed)
4.Type of clothing for neck.	Negative Ranks	6 ^j	4.00	24.00	.05
	Positive Ranks	1 ^k	4.00	4.00	
	Ties	9 ^l			
	Total	16			
6.The opposite of cheap.	Negative Ranks	8 ^p	4.50	36.00	.00
	Positive Ranks	0 ^q	.00	.00	
	Ties	8 ^r			
	Total	16			
7.Something to go running.	Negative Ranks	6 ^s	3.50	21.00	.01
	Positive Ranks	0 ^t	.00	.00	
	Ties	10 ^u			
	Total	16			
10.Sea animal with big arms.	Negative Ranks	6 ^{ab}	3.50	21.00	.01
	Positive Ranks	0 ^{ac}	.00	.00	
	Ties	10 ^{ad}			
	Total	16			
13.Big means of transport.	Negative Ranks	9 ^{ak}	5.00	45.00	.00
	Positive Ranks	0 ^{al}	.00	.00	
	Ties	7 ^{am}			
	Total	16			
14.Something nutritious.	Negative Ranks	8 ^{an}	5.00	40.00	.02
	Positive Ranks	1 ^{ao}	5.00	5.00	
	Ties	7 ^{ap}			
	Total	16			
16.Not dirty.	Negative Ranks	6 ^{at}	3.50	21.00	.01
	Positive Ranks	0 ^{au}	.00	.00	
	Ties	10 ^{av}			
	Total	16			
20.Keep happening.	Negative Ranks	6 ^{bf}	4.00	24.00	.05
	Positive Ranks	1 ^{bg}	4.00	4.00	
	Ties	9 ^{bh}			
	Total	16			
25.Not good.	Negative Ranks	4 ^{bu}	2.50	10.00	.04
	Positive Ranks	0 ^{bv}	.00	.00	
	Ties	12 ^{bw}			
	Total	16			

26. Most important.	Negative Ranks	7 ^{bx}	4.50	31.50	.03
	Positive Ranks	1 ^{by}	4.50	4.50	
	Ties	8 ^{bz}			
	Total	16			
28. Someone who buys things.	Negative Ranks	8 ^{cd}	4.50	36.00	.00
	Positive Ranks	0 ^{ce}	.00	.00	
	Ties	8 ^{cf}			
	Total	16			
29. Person who trains a team.	Negative Ranks	5 ^{cg}	3.00	15.00	.02
	Positive Ranks	0 ^{ch}	.00	.00	
	Ties	11 ^{ci}			
	Total	16			
30. A special characteristic.	Negative Ranks	8 ^{cj}	4.50	36.00	.00
	Positive Ranks	0 ^{ck}	.00	.00	
	Ties	8 ^{cl}			
	Total	16			
33. UPSET: He is upset.	Negative Ranks	14 ^{cs}	8.00	112.00	.00
	Positive Ranks	1 ^{ct}	8.00	8.00	
	Ties	1 ^{cu}			
	Total	16			
34. DRAWER: The drawer was empty.	Negative Ranks	8 ^{cv}	5.00	40.00	.02
	Positive Ranks	1 ^{cw}	5.00	5.00	
	Ties	7 ^{cx}			
	Total	16			
36. SCARED: He was scared.	Negative Ranks	7 ^{db}	4.00	28.00	.00
	Positive Ranks	0 ^{dc}	.00	.00	
	Ties	9 ^{dd}			
	Total	16			
39. POCKET: I keep it in my pocket.	Negative Ranks	10 ^{dk}	6.50	65.00	.02
	Positive Ranks	2 ^{dl}	6.50	13.00	
	Ties	4 ^{dm}			
	Total	16			
40. CAP: I wore this gray cap this morning.	Negative Ranks	6 ^{dn}	4.00	24.00	.05
	Positive Ranks	1 ^{do}	4.00	4.00	
	Ties	9 ^{dp}			
	Total	16			

44.You may go here when you are sick.	Negative Ranks	6 ^{dz}	3.50	21.00	.01
	Positive Ranks	0 ^{ea}	.00	.00	
	Ties	10 ^{eb}			
	Total	16			
46.A girl can wear it at a party.	Negative Ranks	5 ^{ef}	3.00	15.00	.02
	Positive Ranks	0 ^{eg}	.00	.00	
	Ties	11 ^{eh}			
	Total	16			
47.This has a screen to watch programs.	Negative Ranks	7 ^{ei}	4.00	28.00	.00
	Positive Ranks	0 ^{ej}	.00	.00	
	Ties	9 ^{ek}			
	Total	16			
48.You can have a meal here and then pay for it.	Negative Ranks	4 ^{el}	2.50	10.00	.04
	Positive Ranks	0 ^{em}	.00	.00	
	Ties	12 ^{en}			
	Total	16			
49.You use it to draw and write.	Negative Ranks	5 ^{eo}	3.00	15.00	.02
	Positive Ranks	0 ^{ep}	.00	.00	
	Ties	11 ^{eq}			
	Total	16			
51.It is played with small pieces on a large board.	Negative Ranks	6 ^{eu}	4.00	24.00	.05
	Positive Ranks	1 ^{ev}	4.00	4.00	
	Ties	9 ^{ew}			
	Total	16			
52.Women often have to carry their money in it.	Negative Ranks	8 ^{ex}	4.50	36.00	.00
	Positive Ranks	0 ^{ey}	.00	.00	
	Ties	8 ^{ez}			
	Total	16			
54.You can play soccer with this.	Negative Ranks	7 ^{fd}	4.00	28.00	.00
	Positive Ranks	0 ^{fe}	.00	.00	
	Ties	9 ^{ff}			
	Total	16			
55.It is good to take pictures and photos.	Negative Ranks	6 ^{fg}	3.50	21.00	.01
	Positive Ranks	0 ^{fh}	.00	.00	
	Ties	10 ^{fi}			
	Total	16			
56.A group that sings songs at a concert.	Negative Ranks	9 ^{fj}	5.00	45.00	.00
	Positive Ranks	0 ^{fk}	.00	.00	
	Ties	7 ^{fl}			
	Total	16			

57.If you want a peach, you use this to buy it.	Negative Ranks	8 ^{fm}	4.50	36.00	.00
	Positive Ranks	0 ^{fn}	.00	.00	
	Ties	8 ^{fo}			
	Total	16			
58.If you want to buy food, you go this place.	Negative Ranks	12 ^{fp}	6.50	78.00	.00
	Positive Ranks	0 ^{fq}	.00	.00	
	Ties	4 ^{fr}			
	Total	16			
59.You open this to come in and come out.	Negative Ranks	8 ^{fs}	4.50	36.00	.00
	Positive Ranks	0 ^{ft}	.00	.00	
	Ties	8 ^{fu}			
	Total	16			
60.You take this after learning a lot of subjects.	Negative Ranks	11 ^{fv}	6.00	66.00	.00
	Positive Ranks	0 ^{fw}	.00	.00	
	Ties	5 ^{fx}			
	Total	16			

APPENDIX E

The Wilcoxon Test for the Experimental Group

Items	Ranks	N	Mean Rank	Sum of Ranks	Asymp. Sig (2-tailed)
1.Place a person lives in.	Negative Ranks	3 ^a	2.00	6.00	.08
	Positive Ranks	0 ^b	.00	.00	
	Ties	13 ^c			
	Total	16			
2.Big photo in a square.	Negative Ranks	1 ^d	1.00	1.00	.31
	Positive Ranks	0 ^e	.00	.00	
	Ties	15 ^f			
	Total	16			
3.Young woman.	Negative Ranks	0 ^g	.00	.00	1.00
	Positive Ranks	0 ^h	.00	.00	
	Ties	16 ⁱ			
	Total	16			
4.Type of clothing for neck.	Negative Ranks	7 ^j	5.50	38.50	.20
	Positive Ranks	3 ^k	5.50	16.50	
	Ties	6 ^l			
	Total	16			
5.Instrument to cut paper.	Negative Ranks	2 ^m	1.50	3.00	.15
	Positive Ranks	0 ⁿ	.00	.00	
	Ties	14 ^o			
	Total	16			
6.The opposite of cheap.	Negative Ranks	4 ^p	3.00	12.00	.18
	Positive Ranks	1 ^q	3.00	3.00	
	Ties	11 ^r			
	Total	16			

7.Something to go running.	Negative Ranks	3 ^s	2.00	6.00	.08
	Positive Ranks	0 ^t	.00	.00	
	Ties	13 ^u			
	Total	16			
8.Animal that you own.	Negative Ranks	4 ^v	2.50	10.00	.04
	Positive Ranks	0 ^w	.00	.00	
	Ties	12 ^x			
	Total	16			
9.Place for cooking meals.	Negative Ranks	0 ^y	.00	.00	.31
	Positive Ranks	1 ^z	1.00	1.00	
	Ties	15 ^{aa}			
	Total	16			
10.Sea animal with big arms.	Negative Ranks	8 ^{ab}	4.50	36.00	.00
	Positive Ranks	0 ^{ac}	.00	.00	
	Ties	8 ^{ad}			
	Total	16			
11.Part of body to eat food.	Negative Ranks	5 ^{ae}	3.00	15.00	.02
	Positive Ranks	0 ^{af}	.00	.00	
	Ties	11 ^{ag}			
	Total	16			
12.Game with small pieces.	Negative Ranks	7 ^{ah}	4.00	28.00	.00
	Positive Ranks	0 ^{ai}	.00	.00	
	Ties	9 ^{aj}			
	Total	16			
13.Big means of transport.	Negative Ranks	7 ^{ak}	4.00	28.00	.00
	Positive Ranks	0 ^{al}	.00	.00	
	Ties	9 ^{am}			
	Total	16			
14.Something nutritious.	Negative Ranks	9 ^{an}	5.00	45.00	.00
	Positive Ranks	0 ^{ao}	.00	.00	
	Ties	7 ^{ap}			
	Total	16			
15.Ingredient for the soup.	Negative Ranks	8 ^{aq}	4.50	36.00	.00
	Positive Ranks	0 ^{ar}	.00	.00	
	Ties	8 ^{as}			
	Total	16			
16.Not dirty.	Negative Ranks	6 ^{at}	3.50	21.00	.01
	Positive Ranks	0 ^{au}	.00	.00	
	Ties	10 ^{av}			
	Total	16			

17.Free time activity.	Negative Ranks	4 ^{aw}	2.50	10.00	.04
	Positive Ranks	0 ^{ax}	.00	.00	
	Ties	12 ^{ay}			
	Total	16			
18.Buy something outside.	Negative Ranks	7 ^{az}	4.00	28.00	.00
	Positive Ranks	0 ^{ba}	.00	.00	
	Ties	9 ^{bb}			
	Total	16			
19.Take time to rest.	Negative Ranks	6 ^{bc}	3.50	21.00	.01
	Positive Ranks	0 ^{bd}	.00	.00	
	Ties	10 ^{be}			
	Total	16			
20.Keep happening.	Negative Ranks	8 ^{bf}	4.50	36.00	.00
	Positive Ranks	0 ^{bg}	.00	.00	
	Ties	8 ^{bh}			
	Total	16			
21.Use together something.	Negative Ranks	4 ^{bi}	3.00	12.00	.18
	Positive Ranks	1 ^{bj}	3.00	3.00	
	Ties	11 ^{bk}			
	Total	16			
22.Move body with music.	Negative Ranks	1 ^{bl}	1.00	1.00	.31
	Positive Ranks	0 ^{bm}	.00	.00	
	Ties	15 ^{bn}			
	Total	16			
23.Go down on a chair.	Negative Ranks	3 ^{bo}	2.00	6.00	.08
	Positive Ranks	0 ^{bp}	.00	.00	
	Ties	13 ^{bq}			
	Total	16			
24.Move fast with legs.	Negative Ranks	2 ^{br}	2.50	5.00	1.00
	Positive Ranks	2 ^{bs}	2.50	5.00	
	Ties	12 ^{bt}			
	Total	16			
25.Not good.	Negative Ranks	0 ^{bu}	.00	.00	1.00
	Positive Ranks	0 ^{bv}	.00	.00	
	Ties	16 ^{bw}			
	Total	16			
26.Most important.	Negative Ranks	6 ^{bx}	3.50	21.00	.01
	Positive Ranks	0 ^{by}	.00	.00	
	Ties	10 ^{bz}			
	Total	16			

27.The opposite of hot.	Negative Ranks	2 ^{ca}	1.50	3.00	.15
	Positive Ranks	0 ^{cb}	.00	.00	
	Ties	14 ^{cc}			
	Total	16			
28.Someone who buys things.	Negative Ranks	6 ^{cd}	3.50	21.00	.01
	Positive Ranks	0 ^{ce}	.00	.00	
	Ties	10 ^{cf}			
	Total	16			
29.Person who trains a team.	Negative Ranks	7 ^{cg}	4.00	28.00	.00
	Positive Ranks	0 ^{ch}	.00	.00	
	Ties	9 ^{ci}			
	Total	16			
30.A special characteristic.	Negative Ranks	5 ^{cj}	3.00	15.00	.02
	Positive Ranks	0 ^{ck}	.00	.00	
	Ties	11 ^{cl}			
	Total	16			
31.MAINTAIN: Can they maintain it?	Negative Ranks	7 ^{cm}	5.00	35.00	.09
	Positive Ranks	2 ^{cn}	5.00	10.00	
	Ties	7 ^{co}			
	Total	16			
32.STONE: She sat on a stone.	Negative Ranks	7 ^{cp}	4.50	31.50	.03
	Positive Ranks	1 ^{cq}	4.50	4.50	
	Ties	8 ^{cr}			
	Total	16			
33.UPSET: He is upset.	Negative Ranks	7 ^{cs}	4.00	28.00	.00
	Positive Ranks	0 ^{ct}	.00	.00	
	Ties	9 ^{cu}			
	Total	16			
34.DRAWER: The drawer was empty.	Negative Ranks	5 ^{cv}	4.00	20.00	.25
	Positive Ranks	2 ^{cw}	4.00	8.00	
	Ties	9 ^{cx}			
	Total	16			
35.PATIENCE: I don't have patience.	Negative Ranks	7 ^{cy}	4.50	31.50	.03
	Positive Ranks	1 ^{cz}	4.50	4.50	
	Ties	8 ^{da}			
	Total	16			
36.SCARED: He was scared.	Negative Ranks	5 ^{db}	3.00	15.00	.02
	Positive Ranks	0 ^{dc}	.00	.00	
	Ties	11 ^{dd}			
	Total	16			

37.CIRCLE: Please make a circle.	Negative Ranks	5 ^{de}	4.00	20.00	.25
	Positive Ranks	2 ^{df}	4.00	8.00	
	Ties	9 ^{dg}			
	Total	16			
38.VOCABULARY: He needs vocabulary.	Negative Ranks	9 ^{dh}	5.00	45.00	.00
	Positive Ranks	0 ^{di}	.00	.00	
	Ties	7 ^{dj}			
	Total	16			
39.POCKET: I keep it in my pocket.	Negative Ranks	10 ^{dk}	5.50	55.00	.00
	Positive Ranks	0 ^{dl}	.00	.00	
	Ties	6 ^{dm}			
	Total	16			
40.CAP: I wore this gray capthis morning.	Negative Ranks	5 ^{dn}	3.00	15.00	.02
	Positive Ranks	0 ^{do}	.00	.00	
	Ties	11 ^{dp}			
	Total	16			
41.If you want to stay a night, you can have a room.	Negative Ranks	4 ^{dq}	2.50	10.00	.04
	Positive Ranks	0 ^{dr}	.00	.00	
	Ties	12 ^{ds}			
	Total	16			
42.They are the main ingredients for French fries.	Negative Ranks	4 ^{dt}	2.50	10.00	.04
	Positive Ranks	0 ^{du}	.00	.00	
	Ties	12 ^{dv}			
	Total	16			
43.Cheese and yoghurt is made of this.	Negative Ranks	5 ^{dw}	3.00	15.00	.02
	Positive Ranks	0 ^{dx}	.00	.00	
	Ties	11 ^{dy}			
	Total	16			
44.You may go here, when you are sick.	Negative Ranks	7 ^{dz}	4.00	28.00	.00
	Positive Ranks	0 ^{ea}	.00	.00	
	Ties	9 ^{eb}			
	Total	16			
45.You can see colorful pictures and letters in this.	Negative Ranks	4 ^{ec}	2.50	10.00	.04
	Positive Ranks	0 ^{ed}	.00	.00	
	Ties	12 ^{ee}			
	Total	16			
46.A girl can wear it at a party.	Negative Ranks	3 ^{ef}	2.00	6.00	.08
	Positive Ranks	0 ^{eg}	.00	.00	
	Ties	13 ^{eh}			
	Total	16			

47.This has a screen and you can watch programs.	Negative Ranks	3 ^{ei}	2.50	7.50	.31
	Positive Ranks	1 ^{ej}	2.50	2.50	
	Ties	12 ^{ek}			
	Total	16			
48.You can have a meal here and then pay for it.	Negative Ranks	4 ^{el}	2.50	10.00	.04
	Positive Ranks	0 ^{em}	.00	.00	
	Ties	12 ^{en}			
	Total	16			
49.You use it to draw and write.	Negative Ranks	7 ^{eo}	4.00	28.00	.00
	Positive Ranks	0 ^{ep}	.00	.00	
	Ties	9 ^{eq}			
	Total	16			
50.When it is your birthday,you receive lots of them.	Negative Ranks	7 ^{er}	4.00	28.00	.00
	Positive Ranks	0 ^{es}	.00	.00	
	Ties	9 ^{et}			
	Total	16			
51.It is played with small pieces on a large board.	Negative Ranks	9 ^{eu}	5.00	45.00	.00
	Positive Ranks	0 ^{ev}	.00	.00	
	Ties	7 ^{ew}			
	Total	16			
52.Women often have to carry their money in it.	Negative Ranks	8 ^{ex}	4.50	36.00	.00
	Positive Ranks	0 ^{ey}	.00	.00	
	Ties	8 ^{ez}			
	Total	16			
53.Many boys and girls gohere to study.	Negative Ranks	4 ^{fa}	2.50	10.00	.04
	Positive Ranks	0 ^{fb}	.00	.00	
	Ties	12 ^{fc}			
	Total	16			
54.You can play soccer withthis.	Negative Ranks	4 ^{fd}	2.50	10.00	.04
	Positive Ranks	0 ^{fe}	.00	.00	
	Ties	12 ^{ff}			
	Total	16			
55.It is good to take pictures and photos.	Negative Ranks	3 ^{fg}	2.50	7.50	.31
	Positive Ranks	1 ^{fh}	2.50	2.50	
	Ties	12 ^{fi}			
	Total	16			
56.A group that sing songs in a concert.	Negative Ranks	9 ^{fj}	5.00	45.00	.00
	Positive Ranks	0 ^{fk}	.00	.00	
	Ties	7 ^{fl}			
	Total	16			

57.If you want a peach, you use this to buy.	Negative Ranks	2 ^{fm}	2.00	4.00	.56
	Positive Ranks	1 ^{fn}	2.00	2.00	
	Ties	13 ^{fo}			
	Total	16			
58.If you want to buy food, you go to this place.	Negative Ranks	4 ^{fp}	3.00	12.00	.18
	Positive Ranks	1 ^{fq}	3.00	3.00	
	Ties	11 ^{fr}			
	Total	16			
59.You open this to come in and come out.	Negative Ranks	4 ^{fs}	3.00	12.00	.18
	Positive Ranks	1 ^{ft}	3.00	3.00	
	Ties	11 ^{fu}			
	Total	16			
60.You take this after learning a lot of subject.	Negative Ranks	6 ^{fv}	3.50	21.00	.01
	Positive Ranks	0 ^{fw}	.00	.00	
	Ties	10 ^{fx}			
	Total	16			

Appendix F

The Wilcoxon Test for the Experimental Group

Items	Ranks	N	Mean Rank	Sum of Ranks	Asymp. Sig. (2-tailed)
8. Animal that you own.	Negative Ranks	4 ^v	2.50	10.00	.04
	Positive Ranks	0 ^w	.00	.00	
	Ties	12 ^x			
	Total	16			
10. Sea animal with big arms.	Negative Ranks	8 ^{ab}	4.50	36.00	.00
	Positive Ranks	0 ^{ac}	.00	.00	
	Ties	8 ^{ad}			
	Total	16			
11. Part of body to eat food.	Negative Ranks	5 ^{ae}	3.00	15.00	.02
	Positive Ranks	0 ^{af}	.00	.00	
	Ties	11 ^{ag}			
	Total	16			
12. Game with small pieces.	Negative Ranks	7 ^{ah}	4.00	28.00	.00
	Positive Ranks	0 ^{ai}	.00	.00	
	Ties	9 ^{aj}			
	Total	16			
13. Big means of transport.	Negative Ranks	7 ^{ak}	4.00	28.00	.00
	Positive Ranks	0 ^{al}	.00	.00	
	Ties	9 ^{am}			
	Total	16			
14. Something nutritious.	Negative Ranks	9 ^{an}	5.00	45.00	.00
	Positive Ranks	0 ^{ao}	.00	.00	
	Ties	7 ^{ap}			
	Total	16			
15. Ingredient for the soup.	Negative Ranks	8 ^{aq}	4.50	36.00	.00
	Positive Ranks	0 ^{ar}	.00	.00	
	Ties	8 ^{as}			
	Total	16			
16. Not dirty.	Negative Ranks	6 ^{at}	3.50	21.00	.01
	Positive Ranks	0 ^{au}	.00	.00	
	Ties	10 ^{av}			
	Total	16			

17.Free time activity.	Negative Ranks	4 ^{aw}	2.50	10.00	.04
	Positive Ranks	0 ^{ax}	.00	.00	
	Ties	12 ^{ay}			
	Total	16			
18.Buy something outside.	Negative Ranks	7 ^{az}	4.00	28.00	.00
	Positive Ranks	0 ^{ba}	.00	.00	
	Ties	9 ^{bb}			
	Total	16			
19.Take time to rest.	Negative Ranks	6 ^{bc}	3.50	21.00	.01
	Positive Ranks	0 ^{bd}	.00	.00	
	Ties	10 ^{be}			
	Total	16			
20.Keep happening.	Negative Ranks	8 ^{bf}	4.50	36.00	.00
	Positive Ranks	0 ^{bg}	.00	.00	
	Ties	8 ^{bh}			
	Total	16			
26.Most important.	Negative Ranks	6 ^{bx}	3.50	21.00	.01
	Positive Ranks	0 ^{by}	.00	.00	
	Ties	10 ^{bz}			
	Total	16			
28.Someone who buys things.	Negative Ranks	6 ^{cd}	3.50	21.00	.01
	Positive Ranks	0 ^{ce}	.00	.00	
	Ties	10 ^{cf}			
	Total	16			
29.Person who trains a team.	Negative Ranks	7 ^{cg}	4.00	28.00	.00
	Positive Ranks	0 ^{ch}	.00	.00	
	Ties	9 ^{ci}			
	Total	16			
30.A special characteristic.	Negative Ranks	5 ^{cj}	3.00	15.00	.02
	Positive Ranks	0 ^{ck}	.00	.00	
	Ties	11 ^{cl}			
	Total	16			
32.STONE: She sat on a stone.	Negative Ranks	7 ^{cp}	4.50	31.50	.03
	Positive Ranks	1 ^{cq}	4.50	4.50	
	Ties	8 ^{cr}			
	Total	16			
33.UPSET: He is upset.	Negative Ranks	7 ^{cs}	4.00	28.00	.00
	Positive Ranks	0 ^{ct}	.00	.00	
	Ties	9 ^{cu}			
	Total	16			

35.PATIENCE: I don't have patience.	Negative Ranks	7 ^{cY}	4.50	31.50	.03
	Positive Ranks	1 ^{cZ}	4.50	4.50	
	Ties	8 ^{dA}			
	Total	16			
36.SCARED: He was scared.	Negative Ranks	5 ^{dB}	3.00	15.00	.02
	Positive Ranks	0 ^{dC}	.00	.00	
	Ties	11 ^{DD}			
	Total	16			
38.VOCABULARY: He needs vocabulary.	Negative Ranks	9 ^{dH}	5.00	45.00	.00
	Positive Ranks	0 ^{dI}	.00	.00	
	Ties	7 ^{dJ}			
	Total	16			
39.POCKET: I keep it in my pocket.	Negative Ranks	10 ^{dK}	5.50	55.00	.00
	Positive Ranks	0 ^{dL}	.00	.00	
	Ties	6 ^{dM}			
	Total	16			
40.CAP: I wore this gray cap this morning.	Negative Ranks	5 ^{dN}	3.00	15.00	.02
	Positive Ranks	0 ^{dO}	.00	.00	
	Ties	11 ^{dP}			
	Total	16			
41.If you want to stay a night, you can have a room.	Negative Ranks	4 ^{dQ}	2.50	10.00	.04
	Positive Ranks	0 ^{dR}	.00	.00	
	Ties	12 ^{dS}			
	Total	16			
42.They are the main ingredients for French fries.	Negative Ranks	4 ^{dT}	2.50	10.00	.04
	Positive Ranks	0 ^{dU}	.00	.00	
	Ties	12 ^{dV}			
	Total	16			
43.Cheese and yoghurt is made of this.	Negative Ranks	5 ^{dW}	3.00	15.00	.02
	Positive Ranks	0 ^{dX}	.00	.00	
	Ties	11 ^{dY}			
	Total	16			
44.You may go here, when you are sick.	Negative Ranks	7 ^{dZ}	4.00	28.00	.00
	Positive Ranks	0 ^{eA}	.00	.00	
	Ties	9 ^{eB}			
	Total	16			
45.You can see colorful pictures and letters in this.	Negative Ranks	4 ^{eC}	2.50	10.00	.04
	Positive Ranks	0 ^{eD}	.00	.00	
	Ties	12 ^{eE}			
	Total	16			

48.You can have a meal here and then pay for it.	Negative Ranks	4 ^{el}	2.50	10.00	.04
	Positive Ranks	0 ^{em}	.00	.00	
	Ties	12 ^{en}			
	Total	16			
49.You use it to draw and write.	Negative Ranks	7 ^{eo}	4.00	28.00	.00
	Positive Ranks	0 ^{ep}	.00	.00	
	Ties	9 ^{eq}			
	Total	16			
50.When it is your birthday,you receive lots of them.	Negative Ranks	7 ^{er}	4.00	28.00	.00
	Positive Ranks	0 ^{es}	.00	.00	
	Ties	9 ^{et}			
	Total	16			
51.It is played with small pieces on a large board.	Negative Ranks	9 ^{eu}	5.00	45.00	.00
	Positive Ranks	0 ^{ev}	.00	.00	
	Ties	7 ^{ew}			
	Total	16			
52.Women often have to carry their money in it.	Negative Ranks	8 ^{ex}	4.50	36.00	.00
	Positive Ranks	0 ^{ey}	.00	.00	
	Ties	8 ^{ez}			
	Total	16			
53.Many boys and girls gohere to study.	Negative Ranks	4 ^{fa}	2.50	10.00	.04
	Positive Ranks	0 ^{fb}	.00	.00	
	Ties	12 ^{fc}			
	Total	16			
54.You can play soccer with this.	Negative Ranks	4 ^{fd}	2.50	10.00	.04
	Positive Ranks	0 ^{fe}	.00	.00	
	Ties	12 ^{ff}			
	Total	16			
56.A group that sing songs in a concert.	Negative Ranks	9 ^{fi}	5.00	45.00	.00
	Positive Ranks	0 ^{fk}	.00	.00	
	Ties	7 ^{fl}			
	Total	16			
60.You take this after learning a lot of subjects.	Negative Ranks	6 ^{fv}	3.50	21.00	.01
	Positive Ranks	0 ^{fw}	.00	.00	
	Ties	12 ^{en}			
	Total	16			

APPENDIX G

Mann-Whitney U test for the Pre-tests

		Ranks			
	Group	N	Mean Rank	Sum of Ranks	Asymp. Sig. (2-tailed)
1.Place a person lives in	Control group	16	17.50	280.00	.29
	Experimental group	16	15.50	248.00	
	Total	32			
2.Big photo in a square	Control group	16	15.50	248.00	.29
	Experimental group	16	17.50	280.00	
	Total	32			
3.Young woman	Control group	16	15.50	248.00	.15
	Experimental group	16	17.50	280.00	
	Total	32			
4.Type of clothing for neck	Control group	16	15.50	248.00	.48
	Experimental group	16	17.50	280.00	
	Total	32			
5.Instrument to cut paper	Control group	16	16.00	256.00	.63
	Experimental group	16	17.00	272.00	
	Total	32			
6.The opposite of cheap	Control group	16	14.50	232.00	.13
	Experimental group	16	18.50	296.00	
	Total	32			
7.Something to go running	Control group	16	14.50	232.00	.16
	Experimental group	16	18.50	296.00	
	Total	32			
8.Animal that you own	Control group	16	17.00	272.00	.67
	Experimental group	16	16.00	256.00	
	Total	32			
9.Place for cooking meals	Control group	16	16.50	264.00	1.00
	Experimental group	16	16.50	264.00	
	Total	32			

10.Sea animal with big arms	Control group	16	17.50	280.00	.48
	Experimental group	16	15.50	248.00	
	Total	32			
11.Part of body to eat food.	Control group	16	16.00	256.00	.71
	Experimental group	16	17.00	272.00	
	Total	32			
12.Game with small pieces.	Control group	16	17.00	272.00	.72
	Experimental group	16	16.00	256.00	
	Total	32			
13.Big means of transport.	Control group	16	15.50	248.00	.37
	Experimental group	16	17.50	280.00	
	Total	32			
14.Something nutritious.	Control group	16	16.50	264.00	1.00
	Experimental group	16	16.50	264.00	
	Total	32			
15.Ingredient for the soup.	Control group	16	16.50	264.00	1.00
	Experimental group	16	16.50	264.00	
	Total	32			
16.Not dirty.	Control group	16	16.00	256.00	.72
	Experimental group	16	17.00	272.00	
	Total	32			
17.Free time activity.	Control group	16	17.50	280.00	.37
	Experimental group	16	15.50	248.00	
	Total	32			
18.Buy something outside.	Control group	16	18.50	296.00	.13
	Experimental group	16	14.50	232.00	
	Total	32			
19.Take time to rest.	Control group	16	17.50	280.00	.48
	Experimental group	16	15.50	248.00	
	Total	32			
20.Keep happening.	Control group	16	16.50	264.00	1.00
	Experimental group	16	16.50	264.00	
	Total	32			
21.Use together something.	Control group	16	15.00	240.00	.24
	Experimental group	16	18.00	288.00	
	Total	32			
22.Move body with music.	Control group	16	16.50	264.00	1.00
	Experimental group	16	16.50	264.00	
	Total	32			
23.Go down on a chair.	Control group	16	17.00	272.00	.67
	Experimental group	16	16.00	256.00	

24.Move fast with legs	Control group	16	17.50	280.00	.29
	Experimental group	16	15.50	248.00	
	Total	32			
25.Not good	Control group	16	14.50	232.00	.03
	Experimental group	16	18.50	296.00	
	Total	32			
26.Most important	Control group	16	16.00	256.00	.69
	Experimental group	16	17.00	272.00	
	Total	32			
27.The opposite of hot	Control group	16	16.50	264.00	1.00
	Experimental group	16	16.50	264.00	
	Total	32			
28.Someone who buysthings	Control group	16	16.00	256.00	.67
	Experimental group	16	17.00	272.00	
	Total	32			
29.Person who trains a team	Control group	16	14.00	224.00	.06
	Experimental group	16	19.00	304.00	
	Total	32			
30.A special characteristic	Control group	16	16.00	256.00	.55
	Experimental group	16	17.00	272.00	
	Total	32			
31.MAINTAIN: Can theymaintain it?	Control group	16	16.00	256.00	.63
	Experimental group	16	17.00	272.00	
	Total	32			
32.STONE: She sat on astone.	Control group	16	15.00	240.00	.27
	Experimental group	16	18.00	288.00	
	Total	32			
33.UPSET: He is upset.	Control group	16	14.00	224.00	.05
	Experimental group	16	19.00	304.00	
	Total	32			
34.DRAWER: The drawer was empty.	Control group	16	14.50	232.00	.15
	Experimental group	16	18.50	296.00	
	Total	32			
35.PATIENCE: I don't have patience.	Control group	16	16.00	256.00	.63
	Experimental group	16	17.00	272.00	
	Total	32			

36.SCARED: He was scared.	Control group	16	14.00	224.00	.08
	Experimental group	16	19.00	304.00	
	Total	32			
37.CIRCLE: Please make a circle.	Control group	16	15.00	240.00	.29
	Experimental group	16	18.00	288.00	
	Total	32			
38.VOCABULARY: He needs vocabulary.	Control group	16	18.50	296.00	.16
	Experimental group	16	14.50	232.00	
	Total	32			
39.POCKET: I keep it in my pocket.	Control group	16	14.50	232.00	.10
	Experimental group	16	18.50	296.00	
	Total	32			
40.CAP: I wore this gray cap this morning.	Control group	16	16.50	264.00	1.00
	Experimental group	16	16.50	264.00	
	Total	32			
41.If you want to stay a night, you can have a room.	Control group	16	15.00	240.00	.20
	Experimental group	16	18.00	288.00	
	Total	32			
42.They are the main ingredients for French fries.	Control group	16	20.00	320.00	.01
	Experimental group	16	13.00	208.00	
	Total	32			
43.Cheese and yoghurt are made of this.	Control group	16	16.00	256.00	.72
	Experimental group	16	17.00	272.00	
	Total	32			
44.You may go here, when you are sick.	Control group	16	18.00	288.00	.29
	Experimental group	16	15.00	240.00	
	Total	32			
45.You can see colorful pictures and letters in this.	Control group	16	16.50	264.00	1.00
	Experimental group	16	16.50	264.00	
	Total	32			
46.A girl can wear it at a party.	Control group	16	14.50	232.00	.16
	Experimental group	16	18.50	296.00	
	Total	32			
47.This has a screen, and you can watch programs.	Control group	16	14.50	232.00	.13
	Experimental group	16	18.50	296.00	
	Total	32			
48.You can have a meal here and then pay for it.	Control group	16	14.50	232.00	.10
	Experimental group	16	18.50	296.00	
	Total	32			
49.You use it to draw and write.	Control group	16	14.00	224.00	.06
	Experimental group	16	19.00	304.00	
	Total	32			

50. When it is your birthday, you receive lots of them.	Control group	16	16.50	264.00	1.00
	Experimental group	16	16.50	264.00	
	Total	32			
51. It is played with small pieces on a large board.	Control group	16	15.50	248.00	.42
	Experimental group	16	17.50	280.00	
	Total	32			
52. Women often have to carry their money in it.	Control group	16	16.00	256.00	.31
	Experimental group	16	17.00	272.00	
	Total	32			
53. Many boys and girls go here to study.	Control group	16	16.50	264.00	1.00
	Experimental group	16	16.50	264.00	
	Total	32			
54. You can play soccer with this.	Control group	16	13.50	216.00	.03
	Experimental group	16	19.50	312.00	
	Total	32			
55. It is good to take pictures and photos.	Control group	16	14.50	232.00	.16
	Experimental group	16	18.50	296.00	
	Total	32			
56. A group that sing songs in a concert.	Control group	16	15.00	240.00	.15
	Experimental group	16	18.00	288.00	
	Total	32			
57. If you want a peach, you use this to buy it.	Control group	16	14.00	224.00	.07
	Experimental group	16	19.00	304.00	
	Total	32			
58. If you want to buy food, you go to this place.	Control group	16	13.00	208.00	.01
	Experimental group	16	20.00	320.00	
	Total	32			
59. You open this to come in and come out.	Control group	16	14.50	232.00	.16
	Experimental group	16	18.50	296.00	
	Total	32			
60. You take this after learning a lot of subjects.	Control group	16	13.50	216.00	.00
	Experimental group	16	19.50	312.00	
	Total	32			

APPENDIX H

Mann-Whitney U test for the Post-tests

		Ranks			
	Group	N	Mean Rank	Sum of Ranks	Asymp. Sig. (2-tailed)
1.Place a person lives in.	Control group	16	16.50	264.00	1.00
	Experimental group	16	16.50	264.00	
	Total	32			
2.Big photo in a square.	Control group	16	16.50	264.00	1.00
	Experimental group	16	16.50	264.00	
	Total	32			
3.Young woman.	Control group	16	16.00	256.00	.31
	Experimental group	16	17.00	272.00	
	Total	32			
4.Type of clothing for neck	Control group	16	16.00	256.00	.67
	Experimental group	16	17.00	272.00	
	Total	32			
5.Instrument to cut paper	Control group	16	16.50	264.00	1.00
	Experimental group	16	16.50	264.00	
	Total	32			
6.The opposite of cheap	Control group	16	17.00	272.00	.71
	Experimental group	16	16.00	256.00	
	Total	32			
7.Something to go running	Control group	16	16.00	256.00	.63
	Experimental group	16	17.00	272.00	
	Total	32			
8.Animal that you own	Control group	16	16.50	264.00	1.00
	Experimental group	16	16.50	264.00	
	Total	32			
9.Place for cooking meals	Control group	16	17.00	272.00	.31
	Experimental group	16	16.00	256.00	
	Total	32			
10.Sea animal with big arms	Control group	16	16.50	264.00	1.00
	Experimental group	16	16.50	264.00	
	Total	32			
11.Part of body to eat food.	Control group	16	15.00	240.00	.07
	Experimental group	16	18.00	288.00	
	Total	32			

12.Game with small pieces	Control group	16	15.50	248.00	.29
	Experimental group	16	17.50	280.00	
	Total	32			
13.Big means of transport	Control group	16	16.50	264.00	1.00
	Experimental group	16	16.50	264.00	
	Total	32			
14.Something nutritious	Control group	16	15.50	248.00	.48
	Experimental group	16	17.50	280.00	
	Total	32			
15.Ingredient for the soup	Control group	16	14.00	224.00	.01
	Experimental group	16	19.00	304.00	
	Total	32			
16.Not dirty	Control group	16	16.00	256.00	.63
	Experimental group	16	17.00	272.00	
	Total	32			
17.Free time activity	Control group	16	15.50	248.00	.15
	Experimental group	16	17.50	280.00	
	Total	32			
18.Buy something outside	Control group	16	15.50	248.00	.15
	Experimental group	16	17.50	280.00	
	Total	32			
19.Take time to rest	Control group	16	16.00	256.00	.63
	Experimental group	16	17.00	272.00	
	Total	32			
20.Keep happening	Control group	16	15.00	240.00	.28
	Experimental group	16	18.00	288.00	
	Total	32			
21.Use together something	Control group	16	15.50	248.00	.48
	Experimental group	16	17.50	280.00	
	Total	32			
22.Move body with music	Control group	16	16.50	264.00	1.00
	Experimental group	16	16.50	264.00	
	Total	32			
23.Go down on a chair	Control group	16	16.50	264.00	1.00
	Experimental group	16	16.50	264.00	
	Total	32			
24.Move fast with legs	Control group	16	17.00	272.00	.63
	Experimental group	16	16.00	256.00	
	Total	32			

25. Not good	Control group	16	16.50	264.00	1.00
	Experimental group	16	16.50	264.00	
	Total	32			
26. Most important	Control group	16	16.00	256.00	.71
	Experimental group	16	17.00	272.00	
	Total	32			
27. The opposite of hot	Control group	16	16.50	264.00	1.00
	Experimental group	16	16.50	264.00	
	Total	32			
28. Someone who buys things	Control group	16	17.00	272.00	.71
	Experimental group	16	16.00	256.00	
	Total	32			
29. Person who trains a team	Control group	16	13.00	208.00	.00
	Experimental group	16	20.00	320.00	
	Total	32			
30. A special characteristic	Control group	16	17.50	280.00	.48
	Experimental group	16	15.50	248.00	
	Total	32			
31. MAINTAIN: Can they maintain it?	Control group	16	15.50	248.00	.48
	Experimental group	16	17.50	280.00	
	Total	32			
32. STONE: She sat on a stone.	Control group	16	13.50	216.00	.03
	Experimental group	16	19.50	312.00	
	Total	32			
33. UPSET: He is upset.	Control group	16	17.00	272.00	.55
	Experimental group	16	16.00	256.00	
	Total	32			
34. DRAWER: The drawer was empty.	Control group	16	16.50	264.00	1.00
	Experimental group	16	16.50	264.00	
	Total	32			
35. PATIENCE: I don't have patience.	Control group	16	15.00	240.00	.29
	Experimental group	16	18.00	288.00	
	Total	32			
36. SCARED: He was scared.	Control group	16	15.00	240.00	.07
	Experimental group	16	18.00	288.00	
	Total	32			
37. CIRCLE: Please make a circle.	Control group	16	15.50	248.00	.45
	Experimental group	16	17.50	280.00	
	Total	32			
38. VOCABULARY: He needs vocabulary.	Control group	16	15.50	248.00	.29
	Experimental group	16	17.50	280.00	
	Total	32			

39.POCKET: I keep it in my pocket.	Control group	16	13.50	216.00	.00
	Experimental group	16	19.50	312.00	
	Total	32			
40.CAP: I wore this gray cap this morning.	Control group	16	16.50	264.00	1.00
	Experimental group	16	16.50	264.00	
	Total	32			
41.If you want to stay a night, you can have a room.	Control group	16	15.00	240.00	.29
	Experimental group	16	18.00	288.00	
	Total	32			
42.They are the main ingredients for French fries.	Control group	16	18.50	296.00	.10
	Experimental group	16	14.50	232.00	
	Total	32			
43.Cheese and yoghurt is made of this.	Control group	16	16.00	256.00	.63
	Experimental group	16	17.00	272.00	
	Total	32			
44.You may go here, when you are sick.	Control group	16	17.50	280.00	.29
	Experimental group	16	15.50	248.00	
	Total	32			
45.You can see colorful pictures and letters in this.	Control group	16	16.00	256.00	.72
	Experimental group	16	17.00	272.00	
	Total	32			
46.A girl can wear it at a party.	Control group	16	15.50	248.00	.42
	Experimental group	16	17.50	280.00	
	Total	32			
47.This has a screen and you can watch programs.	Control group	16	17.00	272.00	.31
	Experimental group	16	16.00	256.00	
	Total	32			
48.You can have a meal here and then pay for it.	Control group	16	14.50	232.00	.16
	Experimental group	16	18.50	296.00	
	Total	32			
49.You use it to draw and write.	Control group	16	13.00	208.00	.00
	Experimental group	16	20.00	320.00	
	Total	32			
50.When it is your birthday, you receive lots of them.	Control group	16	14.00	224.00	.07
	Experimental group	16	19.00	304.00	
	Total	32			
51.It is played with small pieces on a large board.	Control group	16	13.50	216.00	.02
	Experimental group	16	19.50	312.00	
	Total	32			
52.Women often have to carry their money in it.	Control group	16	16.00	256.00	.72
	Experimental group	16	17.00	272.00	
	Total	32			

53.Many boys and girls go here to study.	Control group	16	15.50	248.00	.15
	Experimental group	16	17.50	280.00	
	Total	32			
54.You can play soccer with this.	Control group	16	15.00	240.00	.15
	Experimental group	16	18.00	288.00	
	Total	32			
55.It is good to take pictures and photos.	Control group	16	16.50	264.00	1.00
	Experimental group	16	16.50	264.00	
	Total	32			
56.A group that sing songs in a concert.	Control group	16	15.00	240.00	.24
	Experimental group	16	18.00	288.00	
	Total	32			
57.If you want a peach, you use this to buy it.	Control group	16	17.50	280.00	.45
	Experimental group	16	15.50	248.00	
	Total	32			
58.If you want to buy food, you go to this place.	Control group	16	17.50	280.00	.29
	Experimental group	16	15.50	248.00	
	Total	32			
59.You open this to come in and come out.	Control group	16	17.00	272.00	.55
	Experimental group	16	16.00	256.00	
	Total	32			
60.You take this after learning a lot of subject.	Control group	16	16.00	256.00	.69
	Experimental group	16	17.00	272.00	
	Total	32			

Özgeçmiş

KİŞİSEL BİLGİLER

Adı Soyadı: Serdar HOŞER

Uyruğu: T.C.

EĞİTİM

Derece	Kurum	Mezuniyet Yılı
Lisans	Anadolu Üniversitesi, Açıköğretim Fakültesi, İngilizce Öğretmenliği	2010
Yüksek Lisans	İstanbul Medeniyet Üniversitesi, Lisansüstü Eğitim Enstitüsü, İngiliz Dili Eğitimi	Devam ediyor

İŞ TECRÜBESİ

Tarih	Kurum	Görev
2013-halen	Milli Eğitim Bakanlığı	İngilizce Öğretmeni

YABANCI DİLLER

İleri düzeyde İngilizce; başlangıç düzeyinde Almanca