

THE EFFECT OF GAMIFICATION ON ENGLISH VOCABULARY: A STUDY OF UNDERGRADUATE STUDENTS IN DISTRICT GUJRAT

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Abstract

The study explores how gamification influences the vocabulary learning of Gujarati undergraduate learners. The use of game-based elements in assignments has become more common amongst instructors who desire to develop a teaching and learning platform that encourages learner involvement. The research adopted a mixed approach and quasi-experimental research design to examine the role of gamification in vocabulary learning, retention, and overall language proficiency. The experimental group received gamified instruction, while the control group received traditional education. Using the cultural dimensions of learning and dual code theory, the study explains how gamification impacts vocabulary acquisition and language retention. Pre- and post-tests, different groups of students, and a teacher survey were used to collect data. Descriptive and inferential analyses showed that the experimental group acquired more vocabulary than the control group. Gamification assisted students in building language competence, vocabulary, and memorization. The findings support active learning theories and the use of games such as Scrabble, Word Bingo, Word Jumble, Vocabulary Charades, and Vocabulary Memory in foreign language learning. The study highlights the importance of motivation and engagement in language development and concludes that gamification can be effectively incorporated into language teaching strategies. The findings will benefit language teachers and policymakers seeking to enhance vocabulary learning and language proficiency at the undergraduate level.

Keywords: *motivation, engagement, gaming, gamification, language learning, English vocabulary.*

Introduction

Acquisition and retention of vocabulary is the main concern in learning a new language. In the modern globalized environment, curriculum activities designed to create interest in English communication establish a healthy vocabulary foundation (Sailer et al., 2017). Traditional approaches to teaching often fail to engage the interests and motivation of students, resulting in slower language learning and vocabulary retention (Alsawaier, 2018). Gamification, which involves the use of game elements and structures in non-game contexts, has recently attracted attention among educators as an innovative strategy for language acquisition. The present study

aims to determine the effect of gamification on English vocabulary learning and retention among undergraduate students in District Gujrat, Pakistan.

English language proficiency is essential for academic and professional success, and the enhancement of English language skills is crucial for students. However, traditional instructional practices often affect students' vocabulary development and language abilities. Educators and researchers have therefore introduced innovative approaches to make language learning more engaging and effective. One such approach is gamification. According to Jordan and Rovai (2004), gamification incorporates achievements, rewards, and competition, transforming learning into a fun and enjoyable activity through intrinsic motivation. It is designed to improve motivation and engagement, making vocabulary learning simple and effective.

Studies have demonstrated the successful use of gamification in various learning environments. Gamification provides interactive learning experiences, immediate feedback, and collaborative opportunities through points, levels, leaderboards, multiplayer games, and discussion forums (Johnson et al., 2016). Despite its advantages, challenges related to curriculum alignment, language proficiency levels, technological infrastructure, and teacher training remain (Kapp, 2012). Therefore, research tailored to Gujrat's cultural and educational context is necessary to explore the effectiveness and potential benefits of gamification in English vocabulary learning and to inform future language teaching practices.

Research Objectives

This study aims to:

- 1-Determine the impact of gamification on the English vocabulary of undergraduates in the District of Gujrat.
- 2-Contrast the results of students who are taught with the help of gamification and those who are taught with the help of traditional methods of instruction.
- 3-Evaluate the vocabulary improvement in learners at both levels of instruction in the gamified approach.
- 4-Determine whether or not there is greater involvement and excitement introduced by gamification in students as they learn English vocabulary.

Research Questions

The guiding light of the study is the following questions:

- 1-How does gamification affect learning of English vocabulary among undergraduate students?
- 2-Is the vocabulary performance of students who learn vocabulary with gamification different from the performance of those who learn vocabulary in the conventional way?
- 3-How effective is gamification on students' vocabulary achievement according to the pre-test and post-test words?
- 4-Is there an increase in students' interest and motivation in acquiring an English vocabulary using gamification?

Review of Literature

What is Gamification in the Classroom?

Over the past years, gamification has received a lot of attention in education as it can make learning more enjoyable. To increase engagement, motivation and performance in non-game contexts (such as Scrabble, Word Bingo, Word Jumble, Vocabulary Charades, and Vocabulary Memory), such as education, it is important to apply game principles and elements to such contexts. As shown by

Chen and his colleagues (2014), classroom game play has become a way to achieve this and make language learning fun and effective.

Gamification: What and how it is used Gamification alters aspects of game design, game mechanics and game concepts to increase interest and engagement in non-gaming situations. Gamification is the process of incorporating various elements of games into activities and environments. These elements include points, badges, leaderboards, levels and awards. James Paul (Gee, 2003) believes these can help learning. There are many potential benefits to integrating gaming in the classroom, especially during language learning. The inclusion of gaming-style elements during class and activities makes language learning fun. Gamification is used by many, such as language learning apps and websites. It is also used in virtual reality simulations. The aim is to make foreign language learning more enjoyable (Arnab & Fernandes, 2015).

Benefits and Challenges to Gamification for Language Learning There are several benefits of using game aspects to learn a new language. First, by tapping into students' hunger for mental stimulation, it will encourage their interest and further learning. When language learning activities are enhanced with game elements, students will be more willing to take part and persist in their efforts. Gamification will enhance students' engagement in the learning process. Also, the design of an optimal learning process will benefit from the peer collaboration and encouragement that gamification will bring about (Burke, 2014). Hanus and Fox (2015) claim that teachers must consider whether the game elements support the learning goals and are not overly complicated. Technical constraints may interfere, especially in low-resource environments. Teachers may also need guidance and support to effectively implement gamification in their lessons.

Previous Research on Gamification's Effectiveness There are many studies that have investigated the use of gamification in education, especially in language learning. The findings indicate that gamification can be used to increase learners' motivation, engagement and learning. Gamified language learning activities can enhance speaking and listening skills, vocabulary learning and understanding of grammar. Another study has also shown the significance of designing gamified activities aligned with the learning goals that provide opportunities for the learners to practise, reflect and receive feedback.

Approaches of Gamification and Theories. The gamification in education utilizes a wide array of models and theories to develop and implement gamification strategies in the classroom (Klopfer et al., 2009). The Dual Code Learning (DCL) theory suggests individuals use two mental codes (visual and verbal) rather than one to complete any type of information processing (Paivio, 1991). This theory states that for optimal learning to take place, both verbal and visual elements need to be incorporated into the design of instruction. The DCL theory suggests that incorporating game features such as graphics, music and interactivity can enhance vocabulary learning by helping students to form associations and imagery with words. The Self-Determination Theory (SDT) argues that intrinsic motivation is essential for learning. Gamification can leverage this approach by offering students the autonomy, competence and relatedness they need to thrive and be intrinsically motivated (Ryan and Deci, 2015). The Cognitive Load Theory (CLT) suggests gamification can facilitate learning by using cognitive resources effectively. Gamification facilitates learning by breaking problems into small pieces and offering feedback to the user. Gamification decreases cognitive load and increases working memory to facilitate vocabulary learning (Sweller, 1988). Moreover, Csikszentmihalyi (1988) proposed the Flow Theory, which assumes that learning occurs when a person is involved in a task and is in the "flow". Gamification

may provide tasks with clear goals, feedback and challenges, helping learners remain focused and engaged.

Language Learning and Gamification In language learning, gamification, a novel technology which uses game features and mechanics to improve vocabulary building, is gaining popularity (Dicheva et al., 2015). A number of studies examined the implications of gamification in language learning with a focus on vocabulary development. Language learning in a gamified environment has led to vocabulary improvement in comparison with traditional language education (Hamari et al., 2016). Gamification contributes to the stimulation of students whereby more students will be enthusiastic and keen to study and in turn more skilled in learning vocabulary. Traditional methods often involve tedious exercises and rote learning. However, gamified elements such as competition, achievement and rewards are likely to engage students' intrinsic motivation (Huang, 2017). Gamification encourages engagement, immersion and interactivity. Students actively engage with vocabulary units and receive adaptive challenges and feedback, helping them develop a deeper understanding and memory retention (Kinzer, 2015; Zhang et al., 2006).

Gamification and Learning Vocabulary Vocabulary learning is an essential component of language learning. A plethora of studies have examined the impact of gamification on vocabulary. They show that gamification has a positive impact on vocabulary acquisition. Gamification's interactive and engaging elements create an immersive learning environment that engages learners in vocabulary learning and enhances their retention of new vocabulary.

Exploring Gamification Strategies and Techniques. A range of gamification approaches have been introduced in language classrooms to enhance word learning. Software and apps that incorporate vocabulary games such as Scrabble, Word Bingo, Word Jumble, Vocabulary Charades and Vocabulary Memory are widely used. Competition, leaderboards, badges and points motivate students and encourage them to improve their performance (Alqahtani, 2015).

The Effect of Gamified Environments on Vocabulary Gamified learning environments are inherently motivating and engaging. They provide students with instant feedback and progress monitoring. Furthermore, gamification has been found to enhance retention of newly learnt vocabulary. The repetition of vocabulary games and quizzes improves vocabulary learning. Contextualization helps students retain and apply words for the long term.

Gamification Platforms and Tools Language learning with gamification tools and platforms is increasingly in the spotlight (Squire, 2006). Memrise, Quizlet, Kahoot and Duolingo make learning fun by using rewards, challenges and leaderboards. Duolingo is a popular language learning app that uses gaming strategies to improve vocabulary, grammar and listening skills (Dominguez et al., 2019). Quizlet uses flashcards and tests, while Kahoot allows teachers to create interactive quizzes.

Evaluation of the Effectiveness and Efficiency Research shows that vocabulary acquisition is improved by using these techniques. It has been reported that Duolingo improves vocabulary learning and memorisation (Grego & Vesselinov, 2012). Gamification resources provide feedback, show progress and allow students to learn independently.

Strengths and Weaknesses of Specific Gamification Tools Gamification technologies can assist vocabulary learning in a number of ways. The game's incentives, rewards and leaderboards motivate students to engage in learning (Barata & Nunes, 2015). Gamification also facilitates the practice and repetition needed to learn a language (Tüzün et al., 2009; Van Eck, 2006). However,

some students may have limited financial or internet resources. Therefore, gamification should be used in addition to standard language learning exercises.

Culture in Gamified Language Learning Second language learning is difficult and cultural aspects play an important role. Gamification in language schools needs to take place in the cultural context of learning.

Impact of Cultural Factors on Gamification Gamification of language learning is more successful when cultural factors are considered (Barata et al., 2013). Cultural preferences, learning preferences and educational norms must be taken into account when developing gamification strategies. Gamification should incorporate culturally relevant details, events and information to enable language learning experiences.

Gamification to Promote Cultural and Language Diversity Gamified environments include elements that symbolise students' diverse backgrounds and experiences. Multicultural stories and avatar creation can help learners feel more connected and included (Annetta et al., 2009). Gamification also provides opportunities for cross-cultural communication and language exchange.

Related Cultural Case Studies and Research Studies conducted in culturally diverse educational settings indicate the benefits of gamification for vocabulary learning, motivation and engagement. Research from Pakistan and other South Asian countries provides useful insights for understanding gamification in contexts similar to Gujrat.

Gamification and Best-Practices Gamification can potentially enhance vocabulary learning, motivation and engagement in the language learning process. For the best use of gamification, several criteria need to be considered, including instructional design, learning objectives, cultural factors, technology availability and learner needs

Research Design

A quasi-experimental design (pretest-posttest control group design) was used in this study. This design is appropriate for educational research where random assignment is not possible and is widely used to examine cause-and-effect relationships in classroom settings (Creswell, 2012). Two existing groups of undergraduate students were selected: an experimental group receiving gamified instruction and a control group taught through traditional methods. Both groups completed pretests and posttests. As reorganizing university classes was not feasible, intact classes were used. A motivational questionnaire was also administered, making the study quasi-mixed in nature. This design aligns with previous gamification studies (Detering et al., 2011; Flores, 2015; Hashim et al., 2019).

Sample

The population comprised undergraduate students enrolled in public and private institutions and universities in District Gujrat during 2023–2024. Purposive sampling was employed to select participants who could provide meaningful information (Cohen et al., 2018). The sample consisted of 100 students, equally divided into an experimental group (n=50) and a control group (n=50). The groups were comparable in age, educational level, and vocabulary proficiency. Most participants were between 18 and 24 years of age, with both male and female students represented.

Table 3.1: Demographic Profile of Participants

Category	Group	Frequency / %
Gender	Male	52 (52%)
	Female	48 (48%)
Program	BS English	60 (60%)
	Other Programs	40 (40%)
Semester	3rd Semester	50 (50%)
	5th Semester	50 (50%)

All participants had studied English as a compulsory subject from secondary to higher secondary levels and were therefore considered to possess basic English proficiency. Students with prior experience of gamified or online learning were excluded to minimize the influence of prior knowledge.

Research Tools

Two instruments were used to collect data: the Vocabulary Achievement Test (VAT) and the Motivation and Engagement Questionnaire (MEQ).

Vocabulary Achievement Test (VAT)

The Vocabulary Achievement Test (VAT) measured students' English vocabulary knowledge. It consisted of 30 items assessing word meaning, contextual usage, word formation, and synonym/antonym recognition. The test included multiple-choice, fill-in-the-blank, matching, and word-in-context tasks. Administered as both pre-test and post-test, it followed Nation's (2001) vocabulary assessment guidelines.

Motivation and Engagement Questionnaire (MEQ)

The Motivation and Engagement Questionnaire (MEQ) measured students' motivation and engagement in vocabulary learning. It consisted of 20 items on a four-point Likert scale examining interest, participation, enjoyment, and perceptions of gamified tools. Developed from language learning motivation literature (Gardner, 2004; Ryan & Deci, 2000), it was administered after gamified instruction and analyzed using descriptive statistics. All instruments were pilot tested with 20 undergraduate students in District Gujrat to improve clarity, identify ambiguities, establish reliability, and make necessary revisions before the main study.

Test Reliability

The reliability of the research instruments was determined through Cronbach's Alpha coefficient, a widely used measure of internal consistency (Nunnally, 1978). The pilot study demonstrated satisfactory reliability. The Vocabulary Achievement Test achieved Alpha values of .81 (pre-test) and .84 (post-test), while the Motivation and Engagement Questionnaire obtained .79.

Table 3.2: Reliability Statistics of Research Instruments

Instrument	No. of Items	Cronbach's Alpha
Vocabulary Test (Pre-test)	30	.81
Vocabulary Test (Post-test)	30	.84
Motivation Questionnaire	20	.79

The results indicate that all instruments were reliable and suitable for use in the study's main data collection period. The instruments' content validity was evaluated through expert consultation. Three academics with specialisations in applied linguistics and English language teaching reviewed the test items and questionnaire, and their feedback was incorporated into the final instruments.

Information Gathering

Data were collected in three stages: pre-test, treatment, and post-test. The data collection process lasted eight weeks during the second semester of the academic year 2023–2024.

Pre-test Stage

The pre-test was administered to both the experimental and control groups during the first week of the study to determine students' initial vocabulary levels and ensure group comparability. The test was conducted under similar supervised conditions for all participants.

Treatment Phase

The treatment phase lasted six weeks. The experimental group learned vocabulary through gamification using points, badges, leaderboards, rewards, Kahoot!, Quizlet Live, Duolingo, and classroom games. Students attended two 45-minute sessions weekly. The control group received traditional instruction through memorization, dictionary exercises, and teacher-led activities, with equal sessions and vocabulary content.

Post-test Stage

The post-test was conducted at the end of the eighth week under the same conditions as the pre-test to measure vocabulary improvement. Following the post-test, the experimental group completed the Motivation and Engagement Questionnaire to provide feedback on their gamified learning experience.

Data Analysis

Data from the vocabulary tests and Motivation and Engagement Questionnaire were analyzed using SPSS Version 26. Descriptive statistics, independent samples t-tests, and paired samples t-tests were employed, with significance set at $p < 0.05$. Questionnaire responses were analyzed using frequencies and percentages to examine motivation, engagement, and gamification effects.

ANALYSIS AND INTERPRETATION OF DATA

Pre-test Analysis: Group Equivalency

A pre-test was administered to both the experimental and control groups to determine their initial vocabulary knowledge and ensure comparability before the treatment. The experimental group obtained a mean score of 11.34 (SD = 2.81), while the control group scored a mean of 11.16 (SD = 2.94). An independent samples t-test revealed no statistically significant difference between the groups ($t = 0.32$, $p = .749$). These results indicate that both groups possessed similar vocabulary

knowledge before the intervention. Therefore, any differences observed in the post-test scores can be attributed to the teaching methods rather than pre-existing differences in vocabulary proficiency. This finding supports the validity of the research design.

Post-Test Results: Gamification Effect

Following the treatment period, both groups improved in vocabulary performance; however, the experimental group showed substantially greater gains. The experimental group achieved a post-test mean score of 18.72 (SD = 2.43), improving by 7.38 marks, while the control group obtained 13.58 (SD = 2.77), improving by 2.42 marks. The mean difference of 5.14 marks indicates that gamification significantly enhanced vocabulary learning and contributed to better learning outcomes among undergraduate students.

Table 4.1: Pre-test and Post-test Mean Scores of Experimental and Control Groups

Group	Test	N	Mean	SD	Sig.
Experimental	Pre-test	50	11.34	2.81	-
Experimental	Post-test	50	18.72	2.43	.000
Control	Pre-test	50	11.16	2.94	-
Control	Post-test	50	13.58	2.77	.000

Table 4.1 results show that there was an improvement in both groups between the pre-test and the post-test. Improvement (mean gain = 7.38) in the experimental group was once more larger as compared to the control group improvement (mean gain = 2.42). This provides the initial piece of evidence to the hypothesis that gamification facilitates the learning of vocabulary.

Independent Sample T-Test

An Independent Sample T-Test was conducted to compare post-test performance between the experimental and control groups (Field, 2013). Levene’s Test confirmed equal variances (F = 1.24, p = .268). Results showed a statistically significant difference, $t(98) = 9.8$, $p < .001$, supporting the effectiveness of gamification in vocabulary learning.

Table 4.2: Independent Samples T-test Results (Post-test Comparison)

Group	N	Mean	SD	t-value	Df	Sig.(2-tailed)
Experimental (Post-test)	50	18.72	2.43	9.84	98	.000
Control (Post-test)	50	13.58	2.77	9.84	98	.000

The statistical test outcome showed that the experimental group scored higher in the post-test ($p < .001$) which proves that the impact of training in English vocabulary with the help of gamification was positive. The study established that there is indeed a substantial difference in the vocabulary performance of students employing gamification in comparison with the traditional classroom practices, therefore, research question 2 was answered positive.

Gain Score: Difference between Pre-Test and Post-Test

Research Question 3 examined vocabulary learning through gain score analysis, calculated by subtracting pre-test from post-test scores. Paired samples t-tests showed significant improvement in both groups: the experimental group increased from 11.34 to 18.72, $t(49) = 18.62, p < .001$, while the control group increased from 11.16 to 13.58, $t(49) = 4.37, p < .001$. The experimental group achieved a 65.1% gain compared to 21.7%, indicating greater effectiveness of gamification.

Table 4.3: Gain Score Analysis (Pre-test to Post-test Improvement)

Group	Pre-test Mean	Post-test Mean	Mean Gain	% Improvement	Sig.
Experimental	11.34	18.72	7.38	65.1%	.000
Control	11.16	13.58	2.42	21.7%	.000

The study provides a strong argument in favor of the application of gamification in enhancing the vocabulary learning outcomes through the eyes of a teacher as compared to the traditional methodology of teaching the vocabulary to the undergraduate students and proves a statistically significant difference of 7.38 marks in the treatment group and 2.42 marks in the control group applicable to the improvement of research question question number 3, hence gaps.

Motivation and Engagement Survey

To address Research Question 4, the experimental group completed the Motivation and Engagement Questionnaire (MEQ) after treatment. Frequencies and percentages revealed highly positive perceptions of gamified learning. Positive responses ranged from 82% to 94% across items, indicating high satisfaction, motivation, and engagement. Gamification promoted an enjoyable, interactive, and participatory learning experience.

Table 4.4: Motivation and Engagement Questionnaire Results (Experimental Group, N=50)

Statement	SA (%)	A (%)	D (%)	SD (%)
Gamified activities made learning enjoyable	58	30	8	4
I felt motivated to attend vocabulary sessions	54	34	8	4
Game elements helped me remember new words	62	26	8	4
I participated more actively in gamified class	52	36	8	4
I prefer gamified over traditional vocabulary teaching	60	28	8	4

The data show strong student support for gamified vocabulary learning. A majority of participants (88%) reported greater enjoyment, interest in classes, easier vocabulary learning, increased participation, and higher motivation through gamified activities. Additionally, 88% preferred

gamified instruction over traditional methods, indicating enhanced motivation, engagement, and positive attitudes toward vocabulary learning.

Results, and Discussion

This study investigated the effect of gamification on English vocabulary learning among undergraduate students in District Gujrat, Pakistan. Using a quasi-experimental pre-test/post-test design, 100 students were divided into an experimental group receiving gamified instruction and a control group receiving traditional instruction. Data were collected through the Vocabulary Achievement Test (VAT) and Motivation and Engagement Questionnaire (MEQ).

The findings revealed that gamification significantly improved vocabulary learning. The experimental group achieved a post-test mean score of 18.72 compared to 13.58 for the control group, with a statistically significant difference ($p < .001$). The experimental group showed a 65.1% improvement, whereas the control group improved by 21.7%.

The study also found that gamification enhanced students' motivation and engagement. Participants reported greater enjoyment, participation, and willingness to learn vocabulary. These findings are consistent with previous research (Flores, 2015; Hashim et al., 2019) and supported by Self-Determination Theory (Ryan & Deci, 2000), indicating that gamification is an effective approach for vocabulary acquisition.

Conclusion

This study investigated the effect of gamification on English vocabulary learning among undergraduate students in District Gujrat. The findings demonstrated that gamified instruction significantly improved vocabulary acquisition, motivation, and student engagement compared to traditional teaching methods. The experimental group achieved substantially higher post-test scores and showed a 65.1% improvement, compared to 21.7% in the control group. Statistical analysis confirmed the effectiveness of gamification ($p < .001$). Students reported positive experiences showing gamification effective in Pakistani classrooms and recommended adoption for vocabulary learning.

. Limitations of the Study

This study has several limitations. It was conducted only in District Gujrat, Punjab, with undergraduate students; therefore, the findings may not be fully generalizable to other regions, educational levels, or institutions in Pakistan. A larger and more diverse sample would allow broader conclusions. The study employed a quasi-experimental design, which is less rigorous than a true experimental design for establishing causation. Although the pre-test helped address group non-equivalence, other factors such as students' use of technology outside class, institutional conditions, and teacher enthusiasm may have influenced the results. These variables were not fully controlled.

Future Research Recommendations.

To illustrate more clearly the effects of gamification on vocabulary acquisition, randomized experimental designs that can be used to introduce external variables that could enhance the quality of the study need to be used. The research samplings must be longitudinal and research must follow-up at varying times to be able to present worth information on whether gamification was effective in enhancing the vocabulary learning. Other language learning skills also need to be taken into account in future studies on the gamification of learning.

References

- Academic Conferences International Limited. Burke, B (2014). *Gamify: How gamification motivates people to do extraordinary things*. Bibliomotion.
- Academic Conferences International Limited. Gee, J. P. (2003). What video games have to teach us about learning and literacy. *Computers in Entertainment (CIE)*, 1(1), 20-20.
- Alqahtani, M. (2015). The effectiveness of using games in teaching grammar to young learners. *Theory and Practice in Language Studies*, 5(7), 1359–1364.
- Alsawaier, R. S. (2018). The effect of gamification on motivation and engagement. *The International Journal of Information and Learning Technology*, 35(1), 56–79.
- Barata, G., Gama, S., Jorge, J., & Gonçalves, D. (2013). Improving participation and learning with gamification. In *Proceedings of the 2nd International Conference on Serious Games Development and Applications* (pp. 3–14). Springer.
- Barata, G., & Nunes, N. J. (2015). Game-based learning in higher education: A review of relevant literature. In *Proceedings of the European Conference on Games Based Learning* (pp. 33–40).
- Burke, B. (2014). *Gamify: How gamification motivates people to do extraordinary things*. Bibliomotion.
- Chen, M., Wang, H., Kinshuk, & Chen, N. S. (2014). Is FLIP enough? Or should we use the FLIPPED model instead? *Computers & Education*, 79, 16–27.
- Cohen, L., Manion, L., & Morrison, K. (2018). *Research methods in education* (8th ed.). Routledge.
- Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Pearson Education.
- Csikszentmihalyi, M. (1988). The flow experience and its significance for human psychology. In *Optimal experience: Psychological studies of flow in consciousness* (pp. 15–35).
- Detering, Flores. (2011). From game design elements to gamefulness: Defining gamification. In *Proceedings of the 15th International Academic MindTrek Conference* (pp. 9–15).
- Domínguez, A., Saenz-de-Navarrete, J., de-Marcos, L., Fernández-Sanz, L., Pagés, C., & Martínez-Herráiz, J. J. (2013). Gamifying learning experiences: Practical implications and outcomes. *Computers & Education*, 63, 380–392.
- Gee, J. P. (2003). What video games have to teach us about learning and literacy. *Computers in Entertainment (CIE)*, 1(1), 20–20.
- Hamari, J., Koivisto, J., & Sarsa, H. (2014). Does gamification work?—A literature review of empirical studies on gamification. In *Proceedings of the 47th Hawaii International Conference on System Sciences* (pp. 3025–3034). IEEE.
- 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 & Education*, 80, 152–161.
- Hashim, H., Rafiq, K. R. M., & Yunus, M. M. (2019). Improving ESL learners' grammar with gamified-learning. *Arab World English Journal*, 5, 41–50.
- Huang, W. H. (2017). Effects of different types of instructional support on students' motivation and learning in digital game-based learning environments. *Journal of Educational Technology & Society*, 20(1), 27–39.
- Johnson, L., Adams Becker, S., Cummins, M., Estrada, V., Freeman, A., & Hall, C. (2016). *NMC/CoSN Horizon Report: 2016 K–12 Edition*. The New Media Consortium.

- Kapp, K. M. (2012). *The gamification of learning and instruction: Game-based methods and strategies for training and education*. John Wiley & Sons.
- Klopfer, E., Osterweil, S., Groff, J., & Haas, J. (2009). *Using the technology of today in the classroom today*. The Education Arcade.
- Nation, I. S. P. (2001). *Learning vocabulary in another language*. Cambridge University Press.
- Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). McGraw-Hill.
- Paivio, A. (1986). *Mental representations: A dual coding approach*. Oxford University Press.
- Plass, J. L., Homer, B. D., & Kinzer, C. K. (2015). Foundations of game-based learning. *Educational Psychologist, 50*(4), 258–283.
- Rovai, A. P., & Jordan, H. M. (2004). Blended learning and sense of community. *International Review of Research in Open and Distance Learning, 5*(2), 1–13.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and intrinsic motivation. *American Psychologist, 55*(1), 68–78.
- Squire, K. D. (2006). From content to context: Videogames as designed experience. *Educational Researcher, 35*(8), 19–29.
- Sweller, J. (1988). Cognitive load during problem solving. *Cognitive Science, 12*(2), 257–285.
- Tüzün, H., et al. (2009). Effects of computer games on students' achievement. *Computers & Education, 52*(1), 68–77.
- Van Eck, R. (2006). Digital game-based learning. *EDUCAUSE Review, 41*(2), 16–30.
- Vesselinov, R., & Grego, J. (2012). *Duolingo effectiveness study*. City University of New York.