

## Research Article

# Do L2 Learners Learn New Vocabulary Implicitly or Explicitly While Playing Online Games?

Mohammadreza Vahdani Asadi \*<sup>1</sup>, Asem Ashari <sup>2</sup>

1. Assistant Professor, Department of Education, Faculty of Human Sciences, University of Bojnord, Bojnord, Iran. (Corresponding Author) [mra\\_vahdani@yahoo.com](mailto:mra_vahdani@yahoo.com)

2. M.A, Department of Education, Faculty of Human Sciences, University of Bojnord, Bojnord, Iran. [asem.ashari@gmail.com](mailto:asem.ashari@gmail.com)

### ARTICLE INFO

#### Submission History

Received: 2025-05-31

Accepted: 2025-07-12

#### Keywords

Game-based learning  
Massively Multiplayer Online  
Role-Playing Games  
World of Warcraft  
Vocabulary Gain, L2 Learning

### ABSTRACT

Internet-related technology has become integral to daily life, significantly influencing education by enhancing accessibility and interactivity. Video games, as a teaching and learning tool, are gaining attention, particularly in language learning. This study aimed to investigate the impact of the Massively Multiplayer Online Role-Playing Game (MMORPG) World of Warcraft on L2 learners' vocabulary acquisition. Forty college and non-college students, all at an intermediate English proficiency level as determined by placement tests, participated in the experiment. They were divided into four groups: two experimental groups (explicit and implicit instruction via World of Warcraft) and two control groups (explicit and implicit instruction via traditional methods). The findings indicated statistically significant positive results for using World of Warcraft as a game-based learning tool for L2 vocabulary gain compared to a regular classroom setting. The study concludes that incorporating video games like World of Warcraft into language learning curricula can be beneficial, not only for vocabulary acquisition but also for other language learning aspects.

## Introduction

The pervasive influence of internet-related technology has reshaped various aspects of

human life, including education (Adipat et al., 2021). Technology offers significant potential in both the content and methodology of student learning. However, acquiring a new language



remains a challenging endeavor, often hindered by factors such as time, cost, instructional quality, and motivation (Lee & Hammer, 2011). Traditional educational approaches are sometimes perceived as monotonous, prompting educators to explore innovative strategies. Among these, Computer Assisted Language Learning (CALL) programs have gained traction. Given that young people spend considerable time playing video games (Forbes, 2019), leveraging games for educational purposes appears to be a promising avenue to enhance student engagement and participation (Fu et al., 2006; 2009).

Video games have been increasingly studied for their potential in second language acquisition (Rudis & Postic, 2018). Their inherent ability to motivate, coupled with features that can boost self-esteem (Aguilar et al., 2020) and foster interest and autonomy (Pillai & Sivathanu, 2019; Tajika, 2020), makes them an attractive tool. The engagement video games offer can lead to the release of pleasure-inducing neurochemicals, potentially enhancing the learning experience (Achtman et al., 2008). Game-based learning, which utilizes games to achieve specific learning outcomes, differs from gamification, which applies game elements to non-game contexts (Hamari, 2023). Massively Multiplayer Online Role-Playing Games (MMORPGs) are a genre with particular potential for language learning, offering immersive virtual worlds where players interact and collaborate (Sourmelis et al., 2017). World of Warcraft, a popular MMORPG, provides a rich environment for communication, social interaction, and role-playing (Blizzard Entertainment, n.d.).

Previous research has highlighted the positive outcomes of game-based language learning, including increased motivation (Papastergiou, 2008), deeper learning (Erhel & Jamet, 2013), and enhanced willingness to communicate (Yeh et al., 2017). Studies have explored various games and their impact on different language skills (e.g., Gualacata, 2022, for speaking; Hashim et al., 2021, for reading; Winaldi & Oktaviani, 2022, for vocabulary). Specifically, MMORPGs have been found to provide relaxed, enjoyable, and community-based learning environments (Kongmee et al., 2012) and can increase learners' readiness to use English (Pettersson, 2012). Dixon and Christison (2018) noted that MMORPGs offer opportunities for negotiating meaning, similar to effective language learning tasks.

Despite the growing body of research, the specific impact of World of Warcraft on vocabulary acquisition, particularly among Iranian EFL learners with varying instructional approaches (implicit vs. explicit), has not been extensively investigated. This study aimed to address this gap by examining the effectiveness of World of Warcraft as a tool for teaching vocabulary to intermediate L2 learners. The study sought to answer the following research questions:

1. Is there a significant difference in the vocabulary scores for the four groups (experimental/explicit; experimental/implicit; control/explicit; control/implicit) while controlling for their pre-test scores?
2. Does the explicit experimental group have higher vocabulary gain in the post-test?

Based on these questions, the following hypotheses were formulated:

1. There is a significant difference in the vocabulary scores for the four groups (experimental/explicit; experimental/implicit; control/explicit; control/implicit) while controlling for their pre-test scores.
2. The explicit experimental group will have higher vocabulary gain in the post-test.

## Methodology

### Design of the Study

A quasi-experimental pretest-posttest design was employed to investigate the effects of World of Warcraft on vocabulary acquisition among intermediate English learners. This design was chosen due to the impracticality of random assignment, allowing for structured comparisons between two experimental groups (non-college students interacting with World of Warcraft) and two control groups (college students reading AI-generated short stories). The pretest established a baseline of participants' vocabulary knowledge, and the posttest evaluated gains after the intervention.

### Participants

Participants were recruited from college communities, social media, and online forums. An initial pool of 60 individuals took a placement test from <https://izaban.org/pt2/> to ascertain their English proficiency. Forty participants (34 males, 6 females) demonstrating intermediate-level proficiency were selected after 20 individuals opted out. These participants were divided into four groups of ten:

- **Experimental Group 1 (Explicit WoW):** Non-college students playing World of Warcraft with explicit vocabulary instruction.

- **Experimental Group 2 (Implicit WoW):** Non-college students playing World of Warcraft with implicit vocabulary exposure.
- **Control Group 1 (Explicit Reading):** College students reading AI-generated short stories with explicit vocabulary instruction.
- **Control Group 2 (Implicit Reading):** College students reading AI-generated short stories with implicit vocabulary exposure.

Assignment to experimental or control groups was based on participants' preferences and prior experience with video games or reading. The control group had no prior video game experience, while the experimental group had prior gaming experience and less interest in reading activities.

### Instruments

The study utilized a placement test, a pretest, and a posttest.

- **Placement Test:** Administered via <https://izaban.org/pt2/> to confirm intermediate proficiency. The Oxford Placement Test (OPT) was unavailable due to access restrictions.
- **Pretest:** A multiple-choice test consisting of 20 vocabulary items selected from a pool of 250 target words embedded in the game and reading materials. The test's difficulty was validated with a comparison group unfamiliar with the items.
- **Posttest:** Similar in format to the pretest, comprising 20 different multiple-choice questions from the same pool of 250 vocabulary words, to assess vocabulary acquisition. Its difficulty was also validated.

### Data Collection Procedure

Data collection began with the placement test. In the first session, all participants completed the pretest. Subsequently, they were assigned to one of the four groups.

- **Explicit Groups:** The researcher monitored the experimental-explicit group playing World of Warcraft, directing their attention to the 250 target vocabulary words integrated into the game. Similarly, the control-explicit group read AI-generated short stories with the 250 target words bolded, and the researcher guided their focus on these words.
- **Implicit Groups:** Participants in the experimental-implicit and control-implicit groups played World of Warcraft or read the short stories, respectively, without any specific instructions or highlighting of the 250 target vocabulary words. The intervention spanned 10 sessions, totaling 10 hours of engagement. A posttest was administered in the final session to measure vocabulary development.

### Data Analysis

Pre and post-test vocabulary scores were compared to quantify improvement. A repeated measures Analysis of Covariance (ANCOVA) was used to determine if there were statistically significant differences in vocabulary acquisition between the groups, controlling for pre-test scores. Correlation analysis was conducted to evaluate the relationship between vocabulary gain. SPSS was used for all statistical analyses.

### Ethical Considerations

Informed consent was obtained from all participants. Participation was voluntary, and individuals could withdraw at any time without penalty. Confidentiality was maintained by using

codes instead of names. Data were kept secure and accessible only to the research team. Approval from the university's ethical committee was obtained before data collection.

## Results

### Descriptive Analysis

Pre-test descriptive statistics (Table 1) revealed variations in baseline vocabulary scores across the groups. The Experimental (Explicit) group had the lowest mean score ( $M=3.44$ ,  $SD=0.73$ ), while the Control (Explicit) group had the highest ( $M=5.36$ ,  $SD=1.03$ ). The Control (Implicit) group showed the most variability ( $SD=2.26$ ). The overall pre-test mean for all 40 participants was 4.35 ( $SD=1.53$ ).

**Table 1**

*Descriptive Statistics for Pre-test Scores (Score out of 20)*

Which Group were they assigned to	Mean	Std. Deviation	N
Experimental (Explicit)	3.4444	.72648	9
Experimental (Implicit)	4.5556	.72648	9
Control group (Explicit)	5.3636	1.02691	11
Control Group (implicit)	3.9091	2.25630	11
Total	4.3500	1.52836	40

Post-test descriptive statistics (Table 2) indicated an increase in mean scores for all groups compared to the pre-test. The Experimental (Explicit) group achieved the highest mean post-test score ( $M=15.44$ ,  $SD=1.33$ ), while the Control (Implicit) group had the lowest ( $M=10.82$ ,  $SD=1.66$ ). The Experimental (Implicit) group showed the highest variability in post-test scores ( $SD=2.54$ ). The overall post-test mean was 12.88 ( $SD=2.43$ ).

**Table 2***Descriptive Statistics for Post-test Scores (Score out of 20)*

Which Group were they assigned to	Mean	Std. Deviation	N
Experimental (Explicit)	15.4444	1.33333	9
Experimental (Implicit)	11.7778	2.53859	9
Control group (Explicit)	13.7273	1.10371	11
Control Group (implicit)	10.8182	1.66242	11
Total	12.8750	2.43044	40

The initial differences in pre-test means, particularly the higher baseline of the Control (Explicit) group, and the variability within groups, especially the Experimental (Implicit) group on the post-test, were noted as potential factors to be addressed by ANCOVA.

### Inferential Statistics

A one-way between-groups ANCOVA was conducted to compare the effectiveness of the

four intervention groups on L2 learners' vocabulary scores, with pre-test scores as the covariate. Preliminary checks confirmed that assumptions of linearity and normality were not violated.

After adjusting for pre-test vocabulary scores, the ANCOVA revealed statistically significant differences between the groups,  $F(3, 35) = 13.765$ ,  $p < .001$ , partial  $\eta^2 = .541$  (Table 3).

**Table 3***Tests of Between-Subjects Effects Dependent Variable: Score out of 20*

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. parameter	Observed power <sup>b</sup>
Corrected Model	124.888 <sup>a</sup>	4	31.222	10.354	.059	.542	41.437	.999
Intercept	588.769	1	588.769	195.350	.000	.848	195.350	1.000
Pretest	.109	1	.109	.036	.850	.001	.036	.054
Group	124.459	3	41.486	13.765	.000	.541	41.295	1.000
Error	105.487	35	3.014					
Total	6861.000	40						
Corrected Total	230.375	39						

a. R Squared = .542 (Adjusted R Squared = .490)

b. Computed using alpha = .05

The pre-test scores (covariate) did not have a statistically significant effect on post-test scores,  $F(1, 35) = 0.036$ ,  $p = .850$ , partial  $\eta^2 = .001$

(Table 4), suggesting that the observed differences in post-test scores were attributable to the type of intervention.

**Table 4**  
*Parameter Estimates*

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval for Difference <sup>b</sup>		Partial Eta Squared	Noncent Parameter	Observed Power <sup>b</sup>
					Lower Bound	Upper Bound			
					Intercept	10.972			
PreTest	-0.039	0.208	-0.190	.850	-0.461	0.382	0.001	0.190	0.054
[Group=1.00]	4.608	0.786	5.861	.000	3.012	6.204	0.495	5.861	1.000
[Group=2.00]	0.985	0.792	1.244	.222	-0.622	2.592	0.042	1.244	0.227
[Group=3.00]	2.966	0.800	3.710	.001	1.343	4.590	0.282	3.710	0.950
[Group=4.00]	0a								

- **a:** This parameter is set to zero because it is redundant.
- **b:** Computed using alpha = .05.

Pairwise comparisons (using Least Significant Difference, Table 5) indicated the following significant differences:

- The Experimental (Explicit) group scored significantly higher than the Experimental (Implicit) group (Mean Difference = 3.62,  $p < .001$ ).
  - The Experimental (Explicit) group scored significantly higher than the Control (Implicit) group (Mean Difference = 4.61,  $p < .001$ ).
  - The Control (Explicit) group scored significantly higher than the Experimental (Implicit) group (Mean Difference = 1.98,  $p = .018$ ).
  - The Control (Explicit) group scored significantly higher than the Control (Implicit) group (Mean Difference = 2.97,  $p = .001$ ).
- The difference between the Experimental (Explicit) and Control (Explicit) groups was not statistically significant at the .05 level (Mean Difference = 1.64,  $p = .069$ ), although the Experimental (Explicit) group had a higher adjusted mean.

**Table 5**  
*Pairwise Comparisons Dependent Variable: Score out of 20*

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig. <sup>b</sup>	95% Confidence Interval for Difference <sup>b</sup>	
					Lower Bound	Upper Bound
Experimental (Explicit)	Experimental (Implicit)	3.623 <sup>*</sup>	.850	.000	1.897	5.349
	Control group (Explicit)	1.641	.876	.069	-.137	3.420
	Control Group (implicit)	4.608	.786	.000	3.012	6.204
	Experimental (Explicit)	-3.623 <sup>*</sup>	.850	.000	-5.349	-1.897

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig. <sup>b</sup>	95% Confidence Interval for Difference <sup>b</sup>	
					Lower Bound	Upper Bound
Experimental (Implicit)	Control group (Explicit)	1.981 <sup>*</sup>	.98	.018	3.602	.361
	Control Group (implicit)	.985	.792	.222	-.622	2.592
Control group (Explicit)	Experimental (Explicit)	-1.641	.876	.069	-3.420	.137
	Experimental (Implicit)	1.981 <sup>*</sup>	.798	.018	.361	3.602
Control Group (implicit)	Control Group (implicit)	2.966 <sup>*</sup>	.800	.001	1.343	4.590
	Experimental (Explicit)	-4.608 <sup>*</sup>	.786	.000	-5.081	-3.012
Control Group (implicit)	Experimental (Implicit)	-.985	.792	.222	-1.347	.622
	Control group (Explicit)	-2.966	.800	.001	-2.643	-1.343

Based on estimated marginal means

\*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

## Discussion

This study investigated the impact of World of Warcraft on L2 vocabulary acquisition among intermediate EFL learners, comparing explicit and implicit instructional approaches within the game to traditional reading-based methods.

### Differences in Vocabulary Scores Across Groups

The first research hypothesis predicted a significant difference in vocabulary scores among the four groups after controlling for pre-test scores. The ANCOVA results supported this hypothesis, revealing significant main effects for the group variable. This indicates that the type of intervention (World of Warcraft vs. reading, explicit vs. implicit instruction) had a significant impact on vocabulary gains. The pre-test scores did not significantly influence post-test outcomes when interventions were considered, suggesting the interventions themselves were the primary drivers of change.

### Efficacy of the Explicit Experimental Group

The second research hypothesis proposed that the explicit experimental group (World of Warcraft with explicit instruction) would demonstrate higher vocabulary gain in the post-test. The results strongly supported this hypothesis. The Experimental (Explicit) group achieved the highest adjusted mean score on the post-test, significantly outperforming the Experimental (Implicit) and Control (Implicit) groups. Although the difference between the Experimental (Explicit) and Control (Explicit) groups did not reach statistical significance ( $p = .069$ ), the Experimental (Explicit) group's mean was numerically higher. This suggests that explicit vocabulary instruction within an engaging, immersive game environment like World of Warcraft is a highly effective method for vocabulary acquisition.

The findings align with previous research suggesting benefits of game-based learning (Milton et al., 2012; Berns et al., 2013) and the importance of explicit instruction in vocabulary

learning. The interactive and contextualized nature of World of Warcraft likely provided rich opportunities for vocabulary exposure and use. When combined with explicit attention drawn to target words, learners were able to make substantial gains. The lower performance of the implicit groups, both game-based and reading-based, underscores the notion that mere exposure to vocabulary, even in an engaging context, may not be as effective as focused instruction for many learners.

The initial lower pre-test scores of the Experimental (Explicit) group, followed by their superior post-test performance, highlight the significant impact of the intervention. It suggests that even learners starting with slightly lower vocabulary knowledge can achieve substantial gains when provided with effective, engaging, and explicit instruction. The immersive nature of WoW, requiring active participation and communication (Horowitz, 2019; Sundqvist & Sylvén, 2012), likely facilitated deeper cognitive processing and retention of the explicitly taught vocabulary. This contrasts with potentially more passive learning in the control conditions, even with explicit instruction.

## Conclusion and Pedagogical Implications

### Conclusion

This study demonstrated that using the MMORPG World of Warcraft as a game-based learning tool can significantly enhance L2 vocabulary acquisition among intermediate EFL learners, particularly when combined with explicit vocabulary instruction. The experimental group receiving explicit instruction within WoW showed the most substantial vocabulary gains, outperforming groups that

received implicit instruction or traditional reading-based instruction. These findings support the integration of well-designed game-based learning approaches into L2 curricula. The immersive, interactive, and motivating environment of World of Warcraft, when coupled with focused pedagogical strategies, offers a powerful medium for language learning.

The results align with previous studies highlighting the motivational and communicative benefits of MMORPGs (e.g., Horowitz, 2019; Pettersson, 2012; Milton et al., 2012). The study contributes to the literature by specifically examining World of Warcraft for vocabulary gain with Iranian EFL learners and comparing explicit and implicit approaches within this context.

### Pedagogical Implications

The findings offer several pedagogical implications for language educators:

- 1. Integrate Game-Based Learning:** Educators should consider incorporating MMORPGs like World of Warcraft into their teaching practices to enhance student engagement and provide authentic contexts for language use.
- 2. Emphasize Explicit Instruction:** While games provide rich input, explicit vocabulary instruction within the game environment appears crucial for maximizing learning outcomes. Teachers can design tasks that draw learners' attention to specific vocabulary items during gameplay.
- 3. Foster Learner Autonomy and Motivation:** The engaging nature of games like WoW can increase learner motivation and provide opportunities for autonomous learning as students explore and interact within the virtual world.

**4. Create Collaborative and Low-Anxiety Environments:** The collaborative aspects of MMORPGs can foster a sense of community and reduce language learning anxiety, encouraging communication and practice.

### Limitations and Suggestions for Further Research

This study has several limitations. The sample size was relatively small (N=40), which may limit the generalizability of the findings. The quasi-experimental design, while practical, is less robust than a true experimental design with random assignment. The duration of the intervention (10 hours) might also be considered relatively short for observing long-term vocabulary retention. Furthermore, the study focused on intermediate learners; findings might differ for beginner or advanced learners. Access to technology and prior gaming experience could also influence outcomes (Pettersson, 2012; Rama et al., 2012).

Future research could address these limitations by:

- Employing larger and more diverse samples.
- Conducting longitudinal studies to assess long-term retention and the impact on other language skills.
- Investigating the effectiveness of WoW for learners at different proficiency levels.
- Exploring how individual differences (e.g., gaming experience, learning styles) interact with game-based learning.
- Comparing different MMORPGs or game genres for language learning.
- Developing and testing specific pedagogical frameworks for integrating MMORPGs into formal language instruction, including

scaffolding for novice learners (Rankin et al., 2006).

Despite these limitations, the study provides valuable insights into the potential of World of Warcraft as an effective and engaging tool for L2 vocabulary acquisition.

### References

- Achtman, R. L., Green, C. S., & Bavelier, D. (2008). Video games as a tool to train visual skills. *Restorative Neurology and Neuroscience*, 26(4-5), 435-446.
- Adipat, S., Laksana, K., Busayanon, K., Asawasowan, A., & Adipat, B. (2021). Engaging students in the learning process with game-based learning: The fundamental concepts. *International Journal of Technology in Education (IJTE)*, 4(3), 542-552. <https://doi.org/10.46328/ijte.169>
- Aguiar-Castillo, L., Clavijo-Rodriguez, A., Hernández-López, L., De Saa-Pérez, P., & Pérez-Jiménez, R. (2021). Gamification and deep learning approaches in higher education. *Journal of Hospitality, Leisure, Sport & Tourism Education*, 29, 100290. <https://doi.org/10.1016/j.jhlste.2020.100290>
- Berns, A., Palomo-Duarte, M., Doderó, J. M., & Valero-Franco, C. (2013). Using a 3D online game to assess students' foreign language acquisition and communicative competence. In P. M. T. M. T. R. M. D. D. J. M. González, & P. Zaphiris (Eds.), *Lecture Notes in Computer Science: Vol. 8110. Human-Computer Interaction. Applications and Services* (pp. 19-31). Springer.
- Blizzard Entertainment. (n.d.). *World of Warcraft*. Retrieved from <https://worldofwarcraft.blizzard.com/en-us/>
- Dixon, D. H., & Christison, M. A. (2018). The usefulness of massively multiplayer online role-playing games (MMORPGs) as tools for promoting second language acquisition. In J. Perren, K. B. Kelech, J. Byun, S. Cervantes, & S. Safavi (Eds.), *Applications of CALL theory in ESL and EFL environments* (pp. 244-268). IGI Global. <https://doi.org/10.4018/978-1-5225-2933-0.ch014>

- Erhel, S., & Jamet, E. (2013). Digital game-based learning: Impact of instructions and feedback on motivation and learning effectiveness. *Computers & Education*, 67, 156-167. <https://doi.org/10.1016/j.compedu.2013.02.019>
- Gualacata, A. F. S. (2022). Use of video games as a resource for the development of listening and speaking skills in UTN students [Unpublished undergraduate thesis]. Universidad Técnica del Norte. [http://repositorio.utn.edu.ec/handle/1234\\_56789/12434](http://repositorio.utn.edu.ec/handle/1234_56789/12434)
- Hamari, J. (2023). Gamification. In G. Ritzer (Ed.), *The Blackwell Encyclopedia of Sociology*. John Wiley & Sons. <https://doi.org/10.1002/9781405165518.wbeos1321>
- Hashim, H. U., Yunus, M. M., & Hashim, H. (2020). Video games: The game changer in teaching writing for ESL learning. *International Journal of Innovation, Creativity and Change*, 11(8), 243-258.
- Horowitz, K. S. (2019). Video games and English as a second language: The effect of massive multiplayer online video games on the willingness to communicate and communicative anxiety of college students in Puerto Rico. *American Journal of Play*, 11(3), 379-410.
- Lee, J. J., & Hammer, J. (2011). Gamification in education: What, how, why bother? *Academic Exchange Quarterly*, 15(2), 1-5.
- Liu, X., & Thompson, P. (2009). Attitude in students' argumentative writing: A contrastive perspective. *Language Studies Working Papers*, 1, 3-15.
- Martin, J. R. (2000). Beyond exchange: Appraisal system in English. In S. Hunston & G. Thompson (Eds.), *Evaluation in text: Authorial stance and the construction of discourse* (pp. 142-177). Oxford University Press.
- Martin, J. R., & Rose, D. (2003). *Working with discourse: Meaning beyond the clause*. Continuum.
- Martin, J. R., & White, P. R. R. (2005). *The language of evaluation: Appraisal in English*. Palgrave Macmillan.
- Milton, J., Jonsen, S., Hirst, S., & Lindenburn, S. (2012). Foreign language vocabulary development through activities in an online 3D environment. *The Language Learning Journal*, 40(1), 99-112. <https://doi.org/10.1080/09571736.2012.650003>
- Nestle, P. (2012). The advantages and disadvantages of MMORPG video games for learning English as a second language. *Computer Games Journal*, 1(1), 103-111. <https://doi.org/10.1007/BF03392331>
- Rama, P. S., Black, R. W., Van Es, E., & Warschauer, M. (2012). Affordances for second language learning in *World of Warcraft*. *ReCALL*, 24(3), 322-338. <https://doi.org/10.1017/S0958344012000195>
- Rankin, Y., Gold, R., & Gooch, B. (2006). 3D role-playing games as language learning tools. In *Proceedings of Eurographics* (Vol. 25, No. 3, pp. 211-225).
- Rudis, D., & Postic, S. (2018). Influence of video games on the acquisition of the English language. *Verbum*, 8, 112-126. <https://doi.org/10.15388/Verb.2017.8.11354>
- Sourmelis, T., Ioannou, A., & Zaphiris, P. (2017). Massively multiplayer online role-playing games (MMORPGs) and the 21st-century skills: A comprehensive research review from 2010 to 2016. *Computers in Human Behavior*, 67, 41-48. <https://doi.org/10.1016/j.chb.2016.10.020>
- Sundqvist, P., & Sylvén, L. K. (2012). Gaming as extramural English L2 learning and L2 proficiency among young learners. *ReCALL*, 24(3), 302-321. <https://doi.org/10.1017/S0958344012000183>
- Winaldi, M. D., & Oktaviani, L. (2022). Influence of video games on the acquisition of the English language. *Journal of English Language Teaching and Learning*, 3(2), 21-26.
- Yeh, Y.-T., Hung, H.-T., & Hsu, Y.-J. (2017). Digital game-based learning for improving students' academic achievement, learning motivation, and willingness to communicate in an English course. *2017 6th IIAI International Congress on Advanced Applied Informatics (IIAI-AAI)*, Hamamatsu, Japan, 560-563. <https://doi.org/10.1109/IIAI-AAI.2017.40>