

A Case of Collaborative and Incidental Vocabulary Learning in MMORPG Context

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Abstract: Recent studies have shown the benefits of technology-enhanced language learning, especially on learners' linguistic and communicative abilities. Massively multiplayer online role-playing game (MMORPG) is an emerging technology which garners interest of the younger generation but has not been widely adopted in language classes as research on its impact is relatively scarce. Thus, this study aims to investigate whether the collaborative discussion in online games and incidental vocabulary learning affect ESL online game players' English language test performance. This study consists of two phases, and this article is based on the first phase. This study involves 16 online ESL game players who played 12 hours of accumulated gameplay sessions in MMORPG. The ESL online game players' pre- and post-English language test scores were then compared. The players' interactions during gameplay were video recorded and analysed for detecting instances of collaborative discussions. This study found that participants who engaged in collaborative discussions during MMORPG sessions showed improvements in their test scores. The findings also suggest that incorporating online games into language learning seems to enhance learners' performance through incidental vocabulary learning.

Keywords: collaborative learning, digital game-based learning, incidental vocabulary learning, massively multiplayer online role-playing game

INTRODUCTION

In recent years, the rapid advancement of digital technology has transformed the landscape of education, particularly in the field of language learning. The global shift towards online education due to the COVID-19 pandemic has highlighted the need for innovative approaches that extend beyond traditional classroom settings (Adedoyin & Soykan, 2020; Bryson &

Andres, 2020; Dinh & Nguyen, 2020; Siti Nurshahidah et al., 2020). As a result, the integration of technology in language learning is seen as crucial for aiding learners' language development, as they seemed to perform better at improving their language proficiency by interacting with modern technology to learn language (Mofareh, 2019). Among these innovations, online games have emerged as a compelling tool for language acquisition, particularly for English as a Second Language (ESL) learners.

Nevertheless, there remains a lack of evidence regarding the English language test performance of participants before and after their gameplay sessions. Furthermore, the findings from past studies are also inadequate as there is little to no evidence indicating whether collaboration during online gameplay sessions plays a significant role in stimulating incidental vocabulary learning among online ESL game players, and how this influences their language proficiency. As learners shift from traditional learning to online collaborative learning due to the COVID-19 pandemic (Gopinathan et al., 2022), it is crucial to explore how collaborative within informal language learning context via games could stimulate game players to learn language incidentally (Hapsari et al., 2018). The findings from Salsabil's et al. (2023) study show that vocabulary knowledge from the massively multiplayer online role-playing games (MMORPGs) increases participants' self-confidence, resulting in increased willingness to communicate during in-game interactions. However, the study did not explore how these in-game interactions influence their English skills, as collaborative discussions with peers during gameplay sessions of MMORPG could potentially impact their English language performance.

Therefore, the study aims to investigate the impact of online gaming on the English language test performance of online ESL game players. In addition, the study also seeks to explore the role of incidental vocabulary learning that transpired during online gameplay sessions on the changes in English language performance among ESL online game players.

LITERATURE REVIEW

Digital game-based learning and Online Gaming

Digital Game-Based Learning (DGBL) is one of the notable pedagogical approaches related to computer-assisted language learning (CALL). It emerges as an innovative educational approach that integrates digital games into pedagogical practices, emphasising the use of computer games to facilitate and aid learners' language learning. A study by Nadeem et al. (2023) reveals that DGBL offers enhanced learners' engagement, in which the interactivity and immersive digital game environments presented in these games entice learners' intrinsic motivation to explore and learn about the game.

Overall, DGBL is capable of impacting the language learning practices by integrating game elements into language education to instil motivation and engagement among language learners. However, as the landscape of education evolves in line with the advancements of technology, there is a growing recognition of the potential for online games. Past studies (Azman & Dollsaid, 2018, Bytheway, 2015; Jack & Maizura, 2017) have highlighted the potentials of online games in facilitating language learning among learners. In addition, the shift into online games is particularly relevant in the context of collaborative learning, where learners are able to engage with their peers in real-time online interactions in order to share knowledge and collaborate to achieve common goals.

Online games and collaborative learning

The assimilation of online gaming into collaborative learning has accumulated substantial attention from the academic field due to its potential for fostering engagement and knowledge acquisition among learners. Numerous studies (Perez-Aranda et al., 2023; Dhiyaneshwari & Devi, 2023; Laakso et al., 2021) have delved into this approach, highlighting the advantages of utilising online games as a catalyst for promoting collaborative learning processes.

Researchers like Perez-Aranda et al. (2023) explored how collaborative and gamified online learning activities affect students' attitudes and social interactions during their participation in these activities. The findings showed that attitude such as perceived usefulness, entertainment, and habit had a positive influence on students' active participation in collaborative and gamified online learning activities (i.e. online board games and online card games). These activities were modelled after the concepts and theories related to the schools of business and management, and law, whereby students needed to give correct answers on the application of concepts for each activity in order to complete the activities and win the games (Perez-Aranda et al., 2023). Concurrently, online game is also viewed as a stimulus to prompting teamwork among students, as the task-based activities presented in digital game environment often simulate real-world scenarios (Zheng & Qiuyung, 2023). The findings from these studies show that students were seen to be more engaged in collaborating with their peers, which allow for an effective knowledge exchange needed to complete the task-based activities.

Incidental Vocabulary Learning

Sinyashina (2020) in her research on incidental vocabulary learning described it as a spontaneous and unintentional process that occurs during learners' learning sessions. Laufer and Hulstijn (2001) highlight that incidental vocabulary learning is significantly affected by the learners' level of attention to the vocabulary encountered while engaging in authentic language activities, as noted by Karimi and Nasouri (2024). Therefore, it is observed that incidental vocabulary learning occurs when the items being learned are not the main focus of the task at hand. Instead, learners engage in an activity primarily to enjoy it or to comprehend a specific message. In this context, they may acquire new vocabulary without any intentional effort to learn those words (Ender, 2016). Additionally, Hapsari et al. (2018) also noted that social interactions among learners and peers can enhance incidental language learning, leading to contextualized learning that aids in understanding how vocabulary functions in various situations. The findings from Hapsari et al. (2018) suggest that due to the non-complex nature of the language instruction within the online game, DoTA 2, participants were seen to be able to negotiate on meanings through collaboration with peers in understanding the new vocabularies during gameplay. A similar case can be observed in the current study, where ESL learners actively participated in collaborative discussions with their peers during MMORPG gameplay sessions. While engaging in these gaming activities, they interacted with each other to talk about the game's storyline, which unintentionally facilitated incidental vocabulary acquisition as they encountered new English words within the game's dialogues and narratives.

METHOD

This study consists of two phases, and the coverage of the present study focuses on the first phase which relates to the use of mixed-method design, and involves three types of data collection techniques, namely (a) pre- and post- test scores, (b) recordings of online gameplay sessions, and (c) observational notes depicting what has occurred during the gameplay sessions.

Participants

The participants of the study consist of 16 online ESL game players (labelled as P1 to P16) from the Philippines, and they were selected via purposive sampling and snowball sampling methods. Overall, four groups of online ESL game players (consisted of four members per group) were selected to participate in this study. All participants were chosen based on their experience as gamers who consistently play online games on a daily basis. The selection of participants also includes them being second language users of English. In addition, the level of English proficiency of these selected participants is level B2 based on the Common European Framework of Reference for Languages (CEFR), whereby they were requested to take an online English level test via the official website of British Council to determine their respective CEFR grade.

Online Gameplay Session – *Lost Ark*

In order to assess the participants' collaboration during gameplay sessions, the online gaming platform, *Lost Ark*, a free-to-play MMORPG was selected. The game offers an open world environment, in which participants can roam around the map and engage with a variety of main quests that are related to the storyline of LA. This MMORPG was selected for this study as it offers a dynamic and interactive online environment for participants to immerse themselves in while discovering the lore of the game, which is also presented in English language. The gameplay sessions and participants' interactions during collaborative discussions via Discord were video and audio recorded using the Open Broadcaster Software (OBS) recording application. During gameplay sessions of *Lost Ark*, participants were required to collaborate with peers to perform and complete the main story quests (MSQs) that were related to the game's storyline in *Lost Ark*. All participants were required to play LA for at least 2 hours per session. The accumulated duration of the gameplay sessions is 15 hours for each group within a week, equalling to about 60 hours of total gameplay sessions recorded and transcribed.

Pre- and post- language assessment

The language assessment was modelled after Cambridge sample test papers that was designed for CEFR B2 level English users. The questions in the language assessment are designed to evaluate participants' English performance that includes vocabulary knowledge, reading comprehension, synonyms and antonyms, as well as the use of tenses. The test items in the English language assessment are based on the MSQs presented in *Lost Ark*, which participants had to experience during gameplay sessions. Participants were required to sit for pre- and post-tests by answering this language assessment before and after the online gameplay sessions of *Lost Ark*.

Data collection procedure

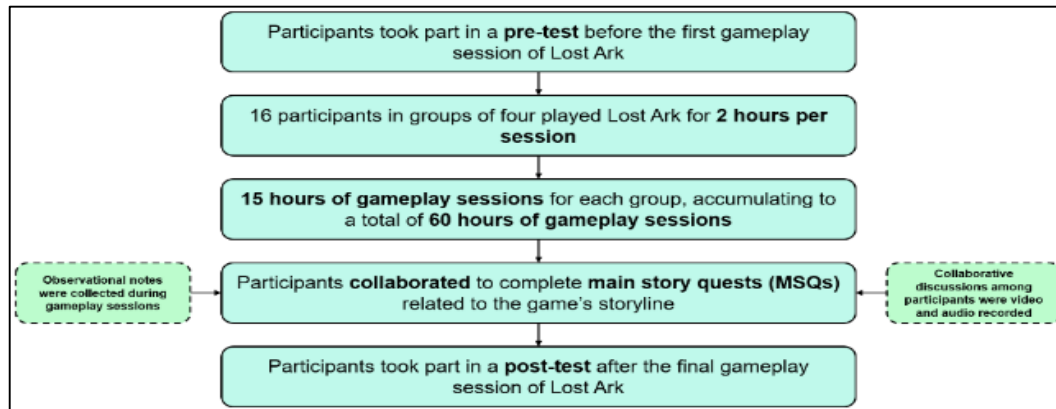


Figure 1: Flow of data collection procedure

Figure 1 above represents the flow of the data collection procedure.

First, the participants were required to take part in a pre- language assessment to assess the initial scores of their English language test performance. Following this, the participants were split into 4 groups of 4 participants each, coinciding with the prescribed number of players needed to form a group to complete the MSQs in LA. Subsequently, the participants were required to participate in an online gameplay of *Lost Ark*, whereby participants needed to collaborate with their groupmates to complete MSQs. Each session took approximately 2 hours, with a total of 15 hours of accumulated online gameplay sessions per group. The total gameplay hours recorded and transcribed for this study was 60 hours. After the last gameplay session was completed by each group, participants were required to take part in a post- language assessment to evaluate their English language test performance scores.

FINDINGS

The Online ESL game players' pre- and post- language assessment test scores

In order to find out the differences in English language test performance of online ESL game players before and after their gameplay sessions of *Lost Ark*, they were required to sit for pre- and post- tests. Table 1 below shows the participants' pre- and post- test scores and the percentile increment in their English language performance after the gameplay sessions of *Lost Ark*.

Table 1: Percentile increment in participants' English language performance

Participant	Pre-Test Score	Post-Test Score	Increment in English Language Performance (%)
1	36/60	44/60	22.22%
2	43/60	49/60	13.95%
3	33/60	43/60	30.30%
4	36/60	44/60	22.22%
5	32/60	40/60	25.00%
6	40/60	51/60	27.50%
7	44/60	49/60	11.36%
8	41/60	47/60	14.63%
9	38/60	45/60	18.42%
10	38/60	44/60	15.79%
11	40/60	50/60	25.00%
12	44/60	50/60	13.64%
13	35/60	42/60	20.00%
14	37/60	47/60	27.03%
15	34/60	43/60	26.47%
16	40/60	46/60	15.00%

The data in Table 1 indicates that the overall participants' English language performance did improve after the gameplay sessions. In addition, the table shows the percentile increment in participants' English language performance based on the differences in their pre- and post- test scores. It is observed that P6, P3, P14, P11, and P15 have the highest percentage in improved English language performance after the gameplay sessions of *Lost Ark*; (a) P3 (test scores improved by 30.30%), (b) P6 (test scores improved by 27.50%), (c) P11 (test scores improved by 25.00%), (d) P14 (test scores improved by 27.03%), and (e) P15 (test scores improved by 26.47%). Conversely, the table also shows that P2, P7, P8, P10, and P16 have the lowest percentage in improved English language performance after the gameplay sessions of *Lost Ark*: (a) P2 (test scores improved by 13.95%), (b) P7 (test scores improved by 11.36%), (c) P8 (test scores improved by 14.63%), (d) P10 (test scores improved by 15.79%), and (e) P16 (test scores improved by 15.00%). In general, the table shows that there is an overall positive increment in all participants' test scores after the gameplay sessions of *Lost Ark*. This suggests that the gameplay sessions do contribute to the improved language performance among participants.

In order to explore how these ESL learners interacted with each other during the gameplay sessions of *Lost Ark*, observational data was noted by the researchers. The analysis suggests that the improvement in participants' test scores may be attributed to their active engagement in collaborative discussions during the gameplay sessions. In these discussions, they were able to collaborate with their peers and discuss test questions that were relevant to the main story quests (MSQs) that they had to complete as part of the game's storyline.

Excerpt 1: Collaborative discussion instance between P6 and P7

P6: Guys, I am rereading Passage 4 here. Does anyone know what " sombre " means? I think I answered this Question 36 correctly.
P7: You mean the definition of "sombre"? It means sadness, or sorrow. Somewhere between the two, I guess.
P6: Oh, so it was a sombre victory, right? Since they won the war but a lot of people were killed?
P7: Yes, you can use this word to indicate that you are sad, or to describe a sad moment.

Excerpt 1 above indicates that ESL learners were able to actively recall the questions and text passages that they had problems with during the pre-test while completing the main story quests (MSQs) in *Lost Ark*. This led to their engagement in collaborative discussions with their peers in order to learn more information on test questions that were deemed problematic or seeking clarification on the game's storyline to further enhance their understanding on the test questions posed in the English language assessment. As a result, participants who took part in these collaborative discussions were seen to better understand the test questions, which in turn resulted in improved English performance during the post-test.

The analysis of the changes in participants' English language performance after their gameplay sessions of *Lost Ark* revealed that ESL were able to retain information more effectively when they worked in groups towards a common objective. As observed in Table 1, the participants' higher post-test scores seem to indicate that they were able to attain a higher level of overall understanding of the text passages presented in the English language assessment. As mentioned by Zhang et al. (2017), collaborative learning within the MMORPG context could take place in various collaborative activities and environments, such as problem-solving story quests, engaging in the game's narrative context, as well as engaging in player interactions. During the gameplay sessions of *Lost Ark*, participants were observed engaging

in collaborative discussions within their respective groups to discuss the game's narrative and aspects of the game mentioned in the test questions that were presented in the English language assessment. This is fundamental to their English language development, as participants were able to progress their linguistic proficiency by collaboratively performing tasks with their peers, which correlates with Shukor's (2015) study. The collaborative discussion, acting as a scaffolding method that is naturally integrated into MMORPGs, motivated participants to guide each other through complex MSQs, understand in-game cutscenes and non-playable character (NPC) dialogues, and thus offered authentic opportunities for learning and applying the English language in context. As a result, participants were able to enhance their vocabulary and reading comprehension skills due to their engagement in collaborative language learning with peers.

Furthermore, digital games are seen to promote incidental acquisition of English language through repetitive exposure (Hapsari et al., 2018; Qasim, 2021; Salsabil et al., 2023). During the pre-test phase, participants were introduced to new English vocabularies and phrases from the text passages in the English language assessment. During the gameplay sessions of *Lost Ark*, participants encountered these similar English vocabularies and phrases while performing MSQs and experiencing in-game cutscenes. As they encountered these phrases and vocabularies repeatedly, it is suggested that participants improved their comprehension as contextual cues were used to explain these vocabularies and phrases throughout their gameplay sessions. According to past studies, learning activities, such as repetitive exposures to target vocabularies, are highly effective for successful language learning (Schmitt, 2008). The repetition of English vocabularies, paired with its usage in narrative contexts that contribute to the understanding of *Lost Ark*'s storyline, helps reinforce participants' long-term retention. As a result, participants were able to enhance their understanding of the meanings and uses of the English vocabularies during the post-test, which significantly helped improve their English language performance after gameplay sessions of *Lost Ark*. In terms of collaboration, the findings echoed what has been stated by Shukor (2015), whereby she emphasised that students displayed high positive attitudes towards using social media for collaborative writing, as they felt that this approach have allowed them to learn from their peers, enriching their content, idea organisation, as well as improving their vocabulary skills. A similar case can be seen in the current study, where participants engaged in collaborative discussions that transpired during their gameplay sessions of *Lost Ark*. These collaborative discussions motivated participants to utilise the English language as a medium of communication when interacting with their peers in topics related to the game's narrative and related test questions regarding the game in the English language assessment, which helped to improve their language performance during their post- English language test. The findings resonate with findings from Tang's et al. (2021) study, learners showed improvements in reading comprehension and oral reading fluency as a result of their peers helping in practising or learning together through collaborative methods employed during classroom sessions.

The Influence of ESL Learners' Incidental Vocabulary Learning during Collaborative Discussions in MMORPG

The second research objective for the first phase of this study was to investigate how collaborative discussions allow for incidental vocabulary learning, which leads to the improvement in ESL learners' English language performance during post-test. Incidental vocabulary learning, particularly in the context of collaborative discussions among learners, plays a crucial role in enhancing English language performance. When learners engage in discussions with their peers, they are often exposed to new vocabulary in the game-related context. This exposure intertwined with the social dynamics of the conversation where learners feel more confident in communicating with others in the target language (Salsabil, 2023),

prompting negotiation of meaning and peer-tutoring. As they navigate these interactions within the MMORPG environment, learners inadvertently acquire vocabulary as they involve themselves in collaborative discussions. This organic learning process, coupled with the in-game elements provided during gameplay, are particularly effective because it allows learners to encounter new words, facilitating deeper understanding and retention (Pereira & Raja Harun, 2024). This enables learners to retain their learning more effectively, as there will be less concern with regards to making mistakes in their language use. Consequently, as learners incorporate this newly acquired vocabulary into their language use, this could not only enhance their performance on assessments but also enriches their overall language proficiency. In the context of this study, it is observed that ESL learners did improve on their English language performance which is evidenced by their increased scores during the post-test.

Excerpt 2: Transcription excerpt on collaborative discussion between P3 and P4

P4: Did you see that quest about the "goblin horde"? What does " horde " mean?
P3: Oh, "horde" refers to a large group of creatures or people . In this case, it means a big group of goblins.
P4: So, it's like when we had to fight that huge group of enemies in the last dungeon?
P3: Exactly! It's often used to describe a swarm or a lot of something. Like, if you say, "a horde of zombies," it means there are many zombies coming at you all at once.
P4: Got it! So, it's kind of like " crowd ," but bigger?
P3: Yes, you're right! A "horde" usually implies a large number of entities and a lot of movement. You can also use it in other contexts, like "a horde of fans" at a concert.
P4: That makes sense! I'll remember that next time I see "horde" in the game. Thanks!
P3: No problem! I feel like we'll probably encounter more new words, and the ones that we saw in the test.

Excerpt 2 shows the collaborative discussion between P3 and P4 during one of the gameplay sessions of *Lost Ark*. This transcription excerpt captures the role of collaborative discussions in promoting English vocabulary learning, where P4 engaged in discussion with P3 to negotiate meaning on one of the English vocabularies that was presented in the game. It is observed here that collaborative discussions in *Lost Ark* create a conducive environment where ESL learners actively engage with peers, facilitating incidental vocabulary learning. When P4 was seeking clarification on the English word "horde" from P3, it catalysed a conversation between them that encouraged a deeper understanding of that particular vocabulary. P3's explanation, enriched with a real-life example, not only clarified the meaning but also contextualised the vocabulary in a way that improved P4's memory retention for that particular vocabulary. As a result, P4 managed to improve his scores in the vocabulary section during the post-test. Hapsari et al. (2018) in their study explain that online games provide opportunities for vocabulary learning, as online game players are required to interact in English, thereby promoting incidental vocabulary learning. The findings of their study also demonstrate the importance of social interaction through chat and voice communication, which opens up opportunities for language practice among digital gamers (Qasim, 2021), specifically online game players (Hapsari et al., 2018). Their findings resonate with the findings from this study, as ESL learners were seen to be able to frequently communicate with their peers during gameplay sessions of *Lost Ark* in the target language. This has opened up opportunities for learners to practice their language skills, as they involved themselves in social interactions that emphasised authentic language use.

PEDAGOGICAL IMPLICATIONS

The pedagogical implication derived from the findings of this study is that collaborative discussions that transpired during gameplay sessions of MMORPG enhance ESL learners' English language performance. The collaborative nature of MMORPGs allows ESL learners to work together on tasks, promoting peer assistance and creating a supportive atmosphere where learners feel more comfortable practicing their language skills with each other. These collaborative discussions not only enhance English language performance but also builds learners' confidence in using English, as they receive immediate feedback from peers and can contextualise new words through incidental vocabulary learning. Simultaneously, as ESL learners interact with other online game players, they are exposed to various dialects and colloquial expressions that enrich their English linguistic repertoire. This exposure is crucial for developing pronunciation skills and fluency, as learners practice speaking in real-time scenarios that mimic everyday communication. Furthermore, the collaboration that occurred during gameplay sessions of MMORPG can significantly promote incidental vocabulary learning among ESL learners, primarily through peer-tutoring. As players work together to achieve common objectives, they often engage in peer-tutoring, where learners who are more proficient in the English language could assist their peers in negotiating meanings of English vocabularies found during gameplay sessions. This collaborative effort not only fosters a sense of community among learners, but also encourages them to communicate more freely and confidently while unconsciously learn new English vocabularies through peer-tutoring. Therefore, this study further reinforces the idea that by incorporating MMORPGs into language learning curriculum, this could supplement the traditional pedagogical approaches by leveraging technology to create a collaborative and interactive learning experiences that resonate with learners' interests and motivations. By fostering collaboration in language learning through online games, educators can promote incidental vocabulary learning among ESL learners, as they are able to learn new English vocabularies through meaningful interactions with their peers.

LIMITATIONS AND RECOMMENDATIONS

A limitation of this study is that it only involved a small sample size, focusing on the impact of collaborative discussions in online games on their English language test performance. Furthermore, with only 16 participants, it is inadequate to establish that the collaborative discussions during online gameplay significantly contributed to enhancing the language test performance of online ESL game players. It is recommended for future studies to incorporate a larger sample size to determine whether the changes in learners' English performance are influenced by their engagement in collaborative discussions during gameplay. Additionally, the present study did not look into ESL learners' communicative competence in English language when they engaged in collaborative discussions that took place during gameplay sessions of MMORPGs. Insights into the communicative competence of ESL online gamers may provide valuable information on how English language skills are applied in online interactions to facilitate effective information exchange. In addition, future studies should also consider exploring how the integration of digital games, particularly MMORPG, as a supplement to the language learning instruction could influence learners' motivation and engagement. As mentioned by Pereira and Raja Harun (2024) in their study, the motivating and engaging aspects of gamified activities could enhance learners' focus on learning new vocabularies. Their study further highlighted the significance of tangible rewards (i.e. 5-mark reward) in motivating students to focus on learning vocabulary to earn these rewards (Pereira & Raja Harun, 2024). Hence, future researchers might want to consider looking into how

gamified elements in MMORPGs could be utilised as extrinsic rewards to foster learners' motivation and engagement during teaching and learning sessions.

CONCLUSION

With advancements in teaching and learning technology, it is apparent that online games, if planned and incorporated appropriately into the language learning process, could benefit learners by enabling them to discuss and learn from their peers through collaboration. With proper planning and guidance, online games, specifically MMORPGs, could be utilised in the current educational context as a supplement to existing teaching and learning pedagogies. This could entice learners to participate in collaborative discussions and experience learning new English vocabularies, incidentally, thus illustrating the benefits of integrating MMORPGs into the language learning syllabus.

REFERENCES

- Adedoyin, O. B., & Soykan, E. (2020). Covid-19 pandemic and online learning: The challenges and opportunities. *Interactive Learning Environments*.
<https://doi.org/10.1080/10494820.2020.1813180>
- Azman, H., & Dollsai, N. F. (2018). Applying massively multiplayer online games (MMOGs) in EFL teaching. *Arab World English Journal*, 9(4).
<https://dx.doi.org/10.24093/awej/vol9no4.1>
- British Council. (n.d.). Free English Online level test.
<https://englishonline.britishcouncil.org/free-english-level-test-cefr-2/>
- Bryson, J. R., & Andres, L. (2020). COVID-19 and rapid adoption and improvisation of online teaching: Curating resources for extensive versus intensive online learning experiences. *Journal of Geography in Higher Education*, 44(4), 1–16.
<https://doi.org/10.1080/03098265.2020.1807478>
- Bytheway, J. (2015). A taxonomy of vocabulary learning strategies used in massively multiplayer online role-playing games. *CALICO Journal*, 32(3), 508-527.
<https://doi.org/10.1558/cj.v32i3.26787>
- Cambridge (n.d.). B2 First exam format. <https://www.cambridgeenglish.org/exams-and-tests/first/exam-format/>
- Dhiyaneshwari, R. P., Chinnasamy, R. D. (2023). Understanding the perspectives and usability of digital games for children with intellectual disabilities. *Journal of Applied Engineering and Technological Science*, 5(1), 608–621. <https://doi.org/10.37385/jaets.v5i1.1657>
- Dinh, L. P., & Nguyen, T. T. (2020). Pandemic, social distancing, and social work education: Students' satisfaction with online education in Vietnam. *Social Work Education*, 39(8), 1074-1083. <https://doi.org/10.1080/02615479.2020.1823365>
- Gopinathan, S., Kaur, A. H., Veeraya, S., & Raman, M. (2022). The role of digital collaboration in student engagement towards enhancing student participation during COVID-19. *Sustainability*, 14, 6844. <https://doi.org/10.3390/su14116844>
- Hapsari, A., Sari, R. P. I. P., & Rais, B. (2018). Gamers' experience on incidental language Learning by playing Defense of the Ancient 2. *IJIE (Indonesian Journal of Informatics Education)*, 2(2), 89. <https://doi.org/10.20961/ijie.v2i2.24156>
- Jack, C. S., & Mazura Mastura Muhammad. (2017). Online games: The impact on gamers mobile language and language learning. *Science International*, 29(1), 165-165. <https://www.thefreelibrary.com/ONLINE+GAMES%3a+THE+IMPACT+ON+GAME>

- RS%27+MOBILE+LANGUAGE+AND+LANGUAGE...-a0487933974 Kuama, S., & Intharaksa, U. (2016). Is Online Learning Suitable for All English Language Students?. *PASAA*, 52, 53-82. DOI: 10.58837/CHULA.PASAA.52.1.3
- Karimi, M. N., & Nasouri, A. (2024). EFL Learners' flow experience and incidental vocabulary learning during text-based game tasks: The moderating role of working memory capacity. *System*, 124, 103398. <https://doi.org/10.1016/j.system.2024.103398>
- Laakso, N., Korhonen, T., & Hakkarainen, K. (2021). Developing students' digital competences through collaborative game design. *Computers & Education*, 174, 104308. <https://doi.org/10.1016/j.compedu.2021.104308>
- 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>
- Mofareh, A. A. (2019). The use of technology in English language teaching. *Frontiers in Education Technology*, 2(3). <https://doi.org/10.22158/fet.v2n3p168>
- Nadeem, M., Oroszlanyova, M., & Farag, W. (2023). Effect of digital game-based learning on student engagement and motivation. *MDPI: Computers*, 12(9), 177. <https://doi.org/10.3390/computers12090177>
- Pereira, J. T., & Raja Harun, R. N. S. (2024). Gamification of Classroom Activities: Undergraduates' Perception. *AJELP: Asian Journal of English Language and Pedagogy*, 12(1), 80–92. <https://doi.org/10.37134/ajelp.vol12.1.7.2024>
- Perez-Aranda, J., Medina-Claros, S. & Urrestarazu-Capellán, R. (2023). Effects of a collaborative and gamified online learning methodology on class and test emotions. Springer: *Education and Information Technologies*. <https://doi.org/10.1007/s10639-023-11879-2>
- Qasim, A. (2021). Impact of digital games on incidental vocabulary acquisition of Pakistani high school students. *Asian EFL Journal*, 28(1), 1-20.
- Salsabil, M., Drajadi, N.A., & Haryati, S. (2023). The Effects of Massively Multiplayer Online Role Playing Games (MMORPG) on Students' Willingness English Communication: A Narrative Inquiry. *Pedagogy: Journal of English Language Teaching*, 11(2). 217-229
- Schmitt, N. (2008). Instructed second language vocabulary learning. *Language Teaching Research*, 12(3), 329-363.
- Sinyashina, E. (2020). 'Incidental + Intentional' vs 'Intentional + Incidental' Vocabulary Learning: Which is More Effective? *Complutense Journal of English Studies*, 28, 93–108. <https://doi.org/10.5209/cjes.66685>
- Siti Nurshahidah Sah Allam, Mohd Sufiean Hassan, Rosilawati Sultan Mohideen, Aini Faezah Ramlan, & Rusydi Mohd Kamal. (2020). Online distance learning readiness during Covid-19 outbreak among undergraduates students. *International Journal of Academic Research in Business & Social Sciences*, 10(5). <https://doi.org/10.6007/IJARBS/v10-i5/7236>
- Tang, X., Li, L., & Zhou, Z. (2021). The effects of collaboration and peer-tutoring on English learners' reading and speaking proficiencies. *Journal of Language and Education*, 7(2), 45-61. DOI: 10.17323/jle.2021.10590
- Zhang, W., Cheng, G., & Wong, L. (2017). Exploring the educational potential of MMORPGs: Collaborative learning in virtual environments. *Journal of Educational Technology & Society*, 20(4), 75-88. DOI: 10.12345/jets.2017.1234
- Zheng, E., & Qiuyung, W. (2023). Effectiveness of online collaborative learning in gamified environments. *International Journal of Emerging Technologies in Learning (iJET)*, 18(17), 33–44. <https://doi.org/10.3991/ijet.v18i17.42851>