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Relating Behavioural Intentions towards Collaborative Discussions and Language Performance of ESL Online Game Players in MMORPG Context

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ABSTRACT

With the advancement of Massively Multiplayer Online Role-Playing Games (MMORPGs), there has been an increase in the number of ESL learners who are involved in online games. However, there is a lack of empirical studies that focused on the impact of MMORPGs on ESL learners' language performance and their behavioural intentions related to collaborative discussions. Therefore, this study aims to investigate the impact of learners' behavioural intentions towards collaborative discussions and their language performance through playing MMORPGs. Using a mixed methods approach, 16 online ESL game players were invited to play MMORPG for 15 hours. The changes in language performance of online ESL game players were based on pre- and post-language tests. A 5-point Likert scale questionnaire was used to assess the participants' intentions towards collaborative discussions in online gameplay. The players' interactions during gameplay were also video recorded and analysed to capture instances of collaborative discussions. The findings indicate that participants with high intentions towards engaging in collaborative discussions seem to show a higher frequency of participation in collaborative discussions and scored higher in both language tests. The results revealed that these players' intentions to engage in collaborative discussions do influence their language learning behaviour and their language performance. This study highlights how the MMORPG context could incentivise ESL learners' engagement in collaborative discussions, which inherently impacts their English language performance through verbal exchanges during gameplay sessions that mirror authentic language use.

Keywords: Digital-Game Based Learning; Behavioural Intention; Collaborative Discussions; Massively Multiplayer Online Role-Playing Game; Theory of Planned Behaviour

INTRODUCTION

The benefits of digital games and their contents that motivate learners to learn aspects of the language outside of games have enticed researchers in the Asian context to pursue the same line of investigation in terms of learning English as a second or foreign language (Hamat & Amran, 2021). Additionally, following the global spread of the COVID-19 pandemic, the rapid advancement in teaching and learning technology has led educators to opt for online classes that promote the beyond-classroom learning environment (Adedoyin & Soykan, 2020; Allam et al., 2020; Bryson & Andres, 2020; Dinh & Nguyen, 2020). Consequently, the implementation of technology in language learning is seen as important in aiding language learners to improve their

language proficiency. Researchers like Mofareh (2019) pointed out that with the assimilation of technology in language learning, learners were seen to perform better at improving their language proficiency as they were seen to respond and interact using modern technology than to acquire knowledge using the traditional approach (Mofareh, 2019).

Numerous past studies have been conducted on the online game genres, particularly involving the massively multiplayer online role-playing games (MMORPG) (Azman & Dollsaid, 2018; Bytheway, 2015; Hamat & Amran, 2021; Jack & Muhammad, 2017). Hamat and Amran (2021) in their study explained that MMORPGs such as Final Fantasy XIV are considered a robust tool for language learning, as online game players were seen to be able to utilise vocabulary learning strategies to assist their vocabulary learning during gameplay sessions. Additionally, popular commercial off-the-shelf (COTS) MMORPG such as World of Warcraft was used by researchers to evaluate language learners' linguistic competency, in addition to their communicative competence during the gameplay sessions (Azman & Dollsaid, 2018). Simultaneously, the findings from Bytheway's (2015) study highlighted that language learners were able to utilise different vocabulary learning strategies (VLS) to acquire new English words during the gameplay sessions, such as using dictionaries, guessing words based on contexts, giving/receiving feedback, and requesting/receiving explanations.

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 that points out whether collaboration plays a significant role in helping online ESL game players to improve their language proficiency during the online gameplay sessions. Learners are shifting from traditional learning to online collaborative learning due to the COVID-19 pandemic (Gopinathan et al., 2022), and it is crucial to explore the role of online collaboration on learners' English language test performance. In addition, digital game-based learning (DGBL) is a pedagogical approach that utilises game mechanics and features by centring ESL learners in meaningful game contexts to promote an interactive learning experience (Naidoo, 2024). DGBL aligns with MMORPGs as these game environments provide immersive and interactive contexts that naturally promote language acquisition through collaborative tasks and authentic communication among peers. Despite the alignment of DGBL and MMORPG that provides opportunities for improving learners' linguistic and communicative capabilities, past literature has also revealed a crucial research gap that necessitates further analysis, which the current study aims to investigate. The research gap of the study focuses on the need for future studies to investigate how collaboration in DGBL could impact participants' language test performance.

The findings from past studies (Amran et al., 2021; Azman & Dollsaid, 2018; Scholz, 2016) demonstrated how collaboration plays a crucial role in aiding learners' communicative competency, as they were seen to communicate better with other players during the gameplay sessions. Despite that, there is a dearth in understanding how the utilisation of MMORPGs in DGBL could improve participants' language test performance, as these studies did not analyse the online interactions and collaborative discussions that occurred between online ESL game players during gameplay. Additionally, there is also a lack of statistical evidence in the past studies, as they did not look into language assessment to detect the changes in participants' performance after gameplay. As such, these are significant data that need to be analysed to detect if there are any differences in participants' language in DGBL compared to the classroom teaching and learning approach.

In line with this, the study aims to investigate the impact of online gaming towards the English language test performance of online ESL game players. This study will also explore how the learners' intentions could influence their participation in collaborative discussions during gameplay sessions. The research questions to be addressed relate to (1) the extent to which online gaming affects the English language test performance of online ESL game players.; (2) how do online ESL game players' behavioural intentions (attitudinal behaviour, subjective norms, and perceived behavioural control) influence their engagement in collaborative discussions during gameplay sessions?; and (3) what extent do online ESL game players' behavioural intentions (attitudinal behaviour, subjective norms, and perceived behavioural control) towards engaging in collaborative discussions during gameplay sessions affect their English language test performance?

LITERATURE REVIEW

DIGITAL GAME-BASED LEARNING

Digital Game-Based Learning (DGBL) is one of the notable pedagogical approaches that relates to computer-assisted language learning (CALL). It emerges as an innovative educational approach that integrates digital games into pedagogical practices. It emphasises the use of computer games to facilitate and aid learners' language learning (Klimova & Kacetl, 2018; Naidoo, 2024). A study by Nadeem et al. (2023) reveals that DGBL offers enhanced learners' engagement, in which the interactive nature and immersive digital game environments presented in these games entice learners' intrinsic motivation to explore and learn about the game. Consequently, in terms of sustaining immersion and reinforcing learners' understanding of the concepts of gameplay, the features in games (i.e. game's storyline, interactive digital environment) could potentially incentivise learners to actively participate in DGBL and collaborate with their peers in completing tasks during gameplay (Lei et al., 2022).

Due to the increase in using DGBL as an instructional approach, the current study aims to explore how collaborative learning in online games could influence ESL learners' language test performance. Digital games, specifically MMORPGs, are inherently engaging and can aid learners' motivation by providing an immersive digital environment for a dynamic and interactive language learning experience (Wenhao & Dazhi, 2012). Furthermore, it can also be assumed that the features in digital games possess the means to encourage positive behaviour among ESL learners, in which in-game interactions and achievement systems are seen to be able to stimulate collaboration among learners, which further reinforces teamwork among themselves to complete task-based activities during gameplay sessions (Amran et al., 2021). Therefore, DGBL could be seen as a viable instructional approach to be utilised in the current study, as the features in digital games could be maximised to entice ESL learners in engaging in collaborative discussions during gameplay sessions.

ONLINE GAMES AND COLLABORATIVE LEARNING

Over the years, 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 (Dhiyaneshwari & Chinnasamy, 2023; Laakso et al., 2021; Perez-Aranda et al., 2023) have delved into this approach, highlighting the advantages of utilising online games as a catalyst for promoting collaborative learning processes.

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 attitudes 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 to complete the activities and win the games (Perez-Aranda et al., 2023). Concurrently, online games are also viewed as a stimulus to prompting teamwork among students, as the task-based activities presented in a digital game environment often simulate real-world scenarios (Zheng & Wang, 2023). As a result, students were seen to be more engaged in collaborating with their peers, which allowed for an effective knowledge exchange needed to complete the task-based activities. In relation to the current study, online games could be seen as a viable initiative to be utilised as a tool to foster collaboration among online ESL game players, as this would entice them to engage in collaborative discussions during gameplay sessions.

AJZEN (1991) THEORY OF PLANNED BEHAVIOUR (TPB)

Ajzen (1991) Theory of Planned Behaviour (TPB) is a prominent psychological framework that was developed to understand and predict human behaviour. It posits that individuals' intentions to engage in a specific behaviour are influenced by three main constructs: attitudinal behaviour (AB), subjective norms (SN), and perceived behavioural control (PBC). These three constructs collectively shape an individual's behavioural intentions. Higher positive attitudes, perceived social support (subjective norms), and a stronger belief in their ability to control the behaviour led to a greater intention to engage in that behaviour.

Attitudinal behaviour (AB) refers to an individual's evaluation or appraisal of a particular behaviour, whether favourably or unfavourably. Ajzen (1991), in his theory, explained that AB is an individual's attitude towards a behaviour and it could significantly affect their intentions and, consequently, their actual behaviour. If a person holds a positive attitude toward a behaviour, they are more likely to form intentions to perform that behaviour. While AB is emphasised in TPB as a crucial construct in predicting one's behavioural intentions, it is also seen as a critical determinant of one's ability to perform an actual behaviour.

Subjective norm (SN) represents an individual's perception of social pressure and expectations related to a specific behaviour. This construct reflects the influence of important others on an individual's decision to engage in a particular action (Li et al., 2023). According to Ajzen (1991), SN directly impacts an individual's behavioural intentions. If a person perceives that their social network expects them to perform a certain behaviour, it can significantly shape their intentions to comply with those expectations (Asare, 2015).

Perceived behavioural control (PBC) refers to an individual's perception of their ability to control or perform a specific behaviour. PBC reflects an individual's belief in their capability to carry out a particular action successfully. It involves assessing one's control over the behaviour in question, considering both internal and external factors. Ajzen (1991) explains that if someone perceives a high level of control over a behaviour, they are more likely to form strong intentions to engage in it. PBC encompasses both internal factors, such as personal skills and abilities, and external factors, like environmental constraints. It is a comprehensive assessment of the resources and obstacles influencing the desired behaviour.

Based on the explanations provided in Ajzen's (1991) study regarding the three constructs of TPB, the present study aims to employ these constructs in a set of 5-point Likert scale questionnaires to investigate online ESL game players' behavioural intentions towards collaborative discussions that take place within the gameplay sessions, and how their participation in collaborative discussions influences their English language test performance. The inclusion of AB, SN, and PBC constructs helps to reflect whether or not the participants are inclined to participate in collaborative discussions during gameplay sessions.

METHODS

The study utilised a mixed methods approach consisting of three data collection techniques, which are a) pre- and post-tests, b) a questionnaire, and c) an online gameplay session. The rationale of implementing the mixed methods approach was to help the researcher accumulate an adequate amount of data required to answer the research questions of the study. As stated by De Loo and Lowe (2011), the combination of quantitative and qualitative analyses could highlight a deeper understanding of the research processes and the researcher's role in the study, which could lead to robust findings and discussions pertaining to the focus of the study.

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. The researcher employed purposive sampling to identify potential candidates through online Discord gaming communities based on four selection criteria: (a) ESL learners who possess B2 Intermediate English language proficiency based on the Common European Framework of Reference for Languages (CEFR), (b) ESL learners who have experience playing online games for at least 3 hours every day, (c) ESL learners' interest in playing Lost Ark, and (d) ESL learners who have never played Lost Ark prior to this study. Next, a snowball sampling method was implemented, and subsequent participants were selected based on the recommendations from the initially selected participants recruited in Discord. The participants were required to take an online English level test via the official website of the British Council to determine their respective CEFR grade.

LOST ARK

To assess the participants' collaboration during gameplay sessions, the online gaming platform, Lost Ark (LA), 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 is selected for this study as it offers a dynamic and interactive online environment for participants to immerse themselves while discovering the lore of the game, which is also offered in the English language. The researcher (labelled as PR) was involved in facilitating participants' gameplay sessions. All participants were required to play LA for at least 2 hours per session. The accumulated duration of the gameplay sessions was 15 hours for each group, equating to 60 hours of total gameplay sessions recorded and transcribed for the study.

Additionally, LA offers a dynamic online environment and in-game cutscenes for participants to immerse themselves while discovering the lore of the game, which is also offered in English. Cutscenes in MMORPGs are scripted cinematic sequences, where the game screen fades out from the actual gameplay and fades into cutscenes before, during, or after players complete the MSQs. The cutscenes are initiated during the game to advance the storyline, provide context, or enhance the overall gaming experience. This feature is crucial in providing a narrative context for players to understand the storyline of the game. Past studies in the field of MMORPGs have touched on the importance of narrative elements within these games. Meredith et al. (2009) explored the role of storytelling and narrative elements in MMORPGs, as they contribute to the immersive aspect of the game. Therefore, it can be seen that cinematic elements such as cutscenes in MMORPGs serve to engage players in the game's narrative, enhance their engagement with the game, and provide context for the main story quests.

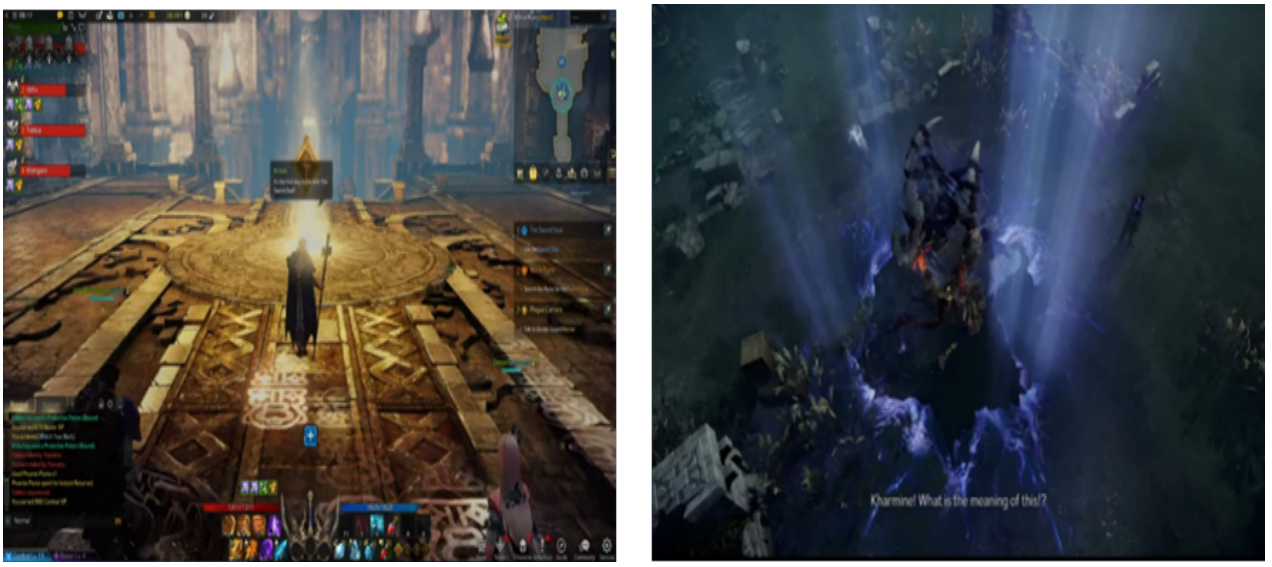


FIGURE 1. Examples of cutscenes experienced by participants when completing MSQs in Lost Ark

DISCORD

All participants were required to use an online push-to-talk computer application as a platform for communication when playing Lost Ark. A computer application, Discord, was chosen as the platform for online communication between participants, as it offers the ability for the researcher to split the participants into four separate online rooms (4 participants per room) to ease the facilitation process, as well as to avoid excessive noise during the gameplay sessions. The separation of participants into different online rooms in the Discord channel is crucial as it significantly reduces the communicative disruption that would usually occur when there are too many players involved in an online group discussion. In addition, Discord was also utilised by the researcher to conduct the online semi-structured interviews with each participant after the final gameplay session.

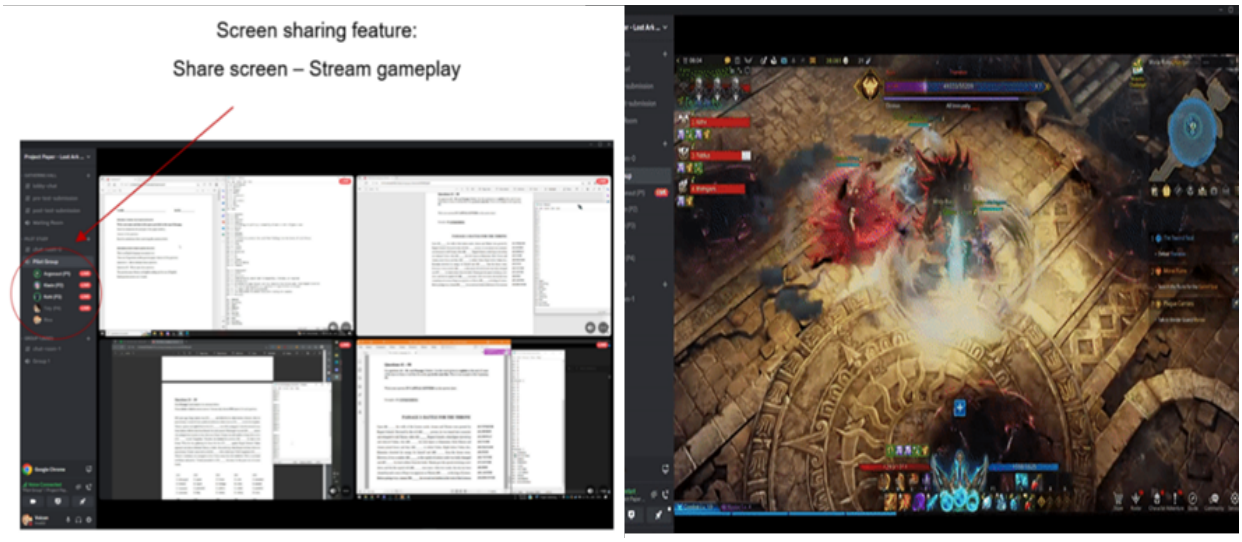


FIGURE 2. Screen-sharing and online communication features of Discord

OPEN BROADCASTER STUDIO

A screen capture and video recording computer application, Open Broadcaster Studio (OBS), was utilised to video record all gameplay sessions of LA. In addition, OBS was also used to audio-record the online semi-structured interview sessions with all 16 participants after the gameplay sessions.

PRE- AND POST- LANGUAGE ASSESSMENT TEST

The language assessment test was modelled after Cambridge sample test papers that were designed for CEFR B2 level English users. The questions in the language assessment test are designed to evaluate participants' English performance, which includes vocabulary knowledge, reading comprehension, synonyms and antonyms, as well as the use of tenses. The test comprises 60 multiple-choice questions and five (5) text passages that participants were required to read to answer the questions (Refer to Appendix 1). Participants were required to sit for pre- and post-tests by answering this language assessment test before and after the online gameplay sessions of

Lost Ark. The same language assessment test was distributed to participants before and after their gameplay sessions of Lost Ark to measure the changes in their language performance. The distribution of this language assessment as pre- and post-tests had directly contributed to the credibility of ESL learners' test scores.

QUESTIONNAIRES USED TO EXPLORE PARTICIPANTS' BEHAVIOURAL INTENTIONS

A set of 5-point Likert scale questionnaires (from the scale of 1 to 5 to indicate agreement with statements) was distributed to all participants prior to the first gameplay session. The questionnaires were employed to explore participants' behavioural intentions towards taking part in collaborative discussions during gameplay sessions. The 28-item questionnaires used in this study were based on Fishbein and Ajzen (2011) Predicting and Changing Behaviour: The Reasoned Action Approach, whereby it served as a guideline that the researcher used when constructing the questionnaire items that are linked to the three constructs of Ajzen's (1991) TPB, namely (a) attitudinal behaviour, (b) subjective norms, and (c) perceived behavioural control. The internal consistency of the 5-point Likert scale questionnaire was assessed using the Statistical Package for Social Sciences (SPSS) to ensure that the items in each section of the questionnaire reliably measure participants' behavioural intentions based on the four constructs of TPB. The Cronbach's alpha reading for this questionnaire is 0.953, indicating a high level of internal consistency (George & Mallery, 2019). This reading suggests that the 5-point Likert scale questionnaire is deemed acceptable to be utilised in this study. The participants' average scores for each construct in their respective sections of the questionnaires were calculated and labelled as TPB index readings to determine whether they have positive or negative behavioural intentions towards engaging in collaborative discussions during gameplay sessions.

ONLINE GAMEPLAY SESSION

An ethnographic approach was utilised in this study, where the researcher assumed the role of a facilitator in all online gameplay sessions of Lost Ark to observe the participants of the study. Till (2009) explained that one of the methods used by researchers when conducting an ethnographic study is to produce field notes through observations on participants during the data collection procedure to capture the events or activities that transpire at the given time. Through this approach, the researcher was able to utilise the data to determine whether participants' engagement in collaborative discussions during gameplay sessions of LA could influence their English language test performance.

DATA COLLECTION PROCEDURE

Figure 3 below represents the flow of the data collection procedure.

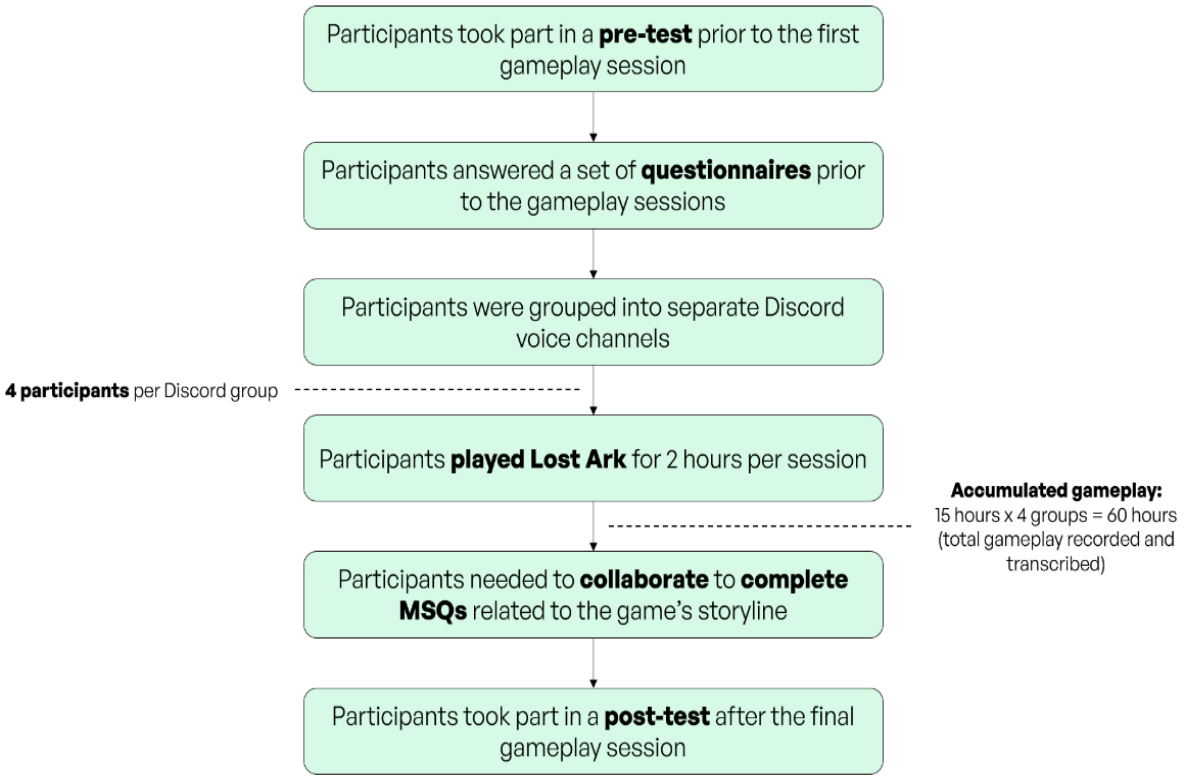


FIGURE 3. Flow of the data collection procedure

First, the participants were required to take part in a pre-language assessment test to assess their initial scores on the English language test. Then, the participants answered a set of questionnaires prior to the gameplay sessions to determine their TPB index readings for intention, AB, SN, and PBC. Following this, the participants were randomly split into four groups of 4 participants each, which coincided with the prescribed number of players needed to form a group to complete the MSQs according to the game mechanics 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 the last session being only 1 hour, resulting in a total of 15 hours of accumulated online gameplay sessions per group. The total gameplay hours recorded and transcribed for this study were 60 hours. After the last gameplay session was completed by each group, participants were required to take part in a post-language assessment test to evaluate their English language test performance scores.

ETHICAL CONSIDERATIONS

Prior to data collection, informed consent had been obtained from all participants. In addition, the personal details (i.e. name, age, etc.) of all participants were anonymised to protect their privacy. The authors had also obtained formal ethical approval from the institutional research board.

DATA ANALYSIS AND FINDINGS

THE ONLINE ESL GAME PLAYERS' PRE- AND POST- LANGUAGE ASSESSMENT TEST SCORES

In order to investigate how collaborative discussions during gameplay sessions of Lost Ark could influence online ESL game players' English language test performance, the overall research findings were collected using a quantitative approach by utilising language assessment tests to find out participants' pre- and post-test scores. They were required to take part in a pre-test prior to the first gameplay session, as well as a post-test after the final gameplay session. Their test scores were then categorised in Table 1.

The data in Table 1 indicate that the overall participants' English language test performance was improved after the gameplay sessions. For the vocabulary and reading comprehension sections of the language assessment tests, all participants were seen to have improved during post-test as compared to their pre-test scores. Despite the improvement in test scores, they did not show marked changes, as there was only a small increment in their test scores. For the synonym and antonym section, most participants were seen to improve on their understanding of the similar and opposite meanings of English words that were asked during the language assessment tests. However, some participants' test scores (P6, P7, and P16) remained unchanged during the post-test. For the usage of tenses, a majority of the participants showed positive improvements during the post-test. However, the post-test scores of P5 and P14 in this section remained unchanged.

TABLE 1. Participants' pre- and post- language assessment test scores

P	Vocabulary Reading and Comprehension		Synonym and Antonym		Use of Tenses		Total Scores	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
1	19/23	20/23	10/12	12/12	15/25	18/25	44/60	50/60
2	14/23	19/23	17/12	9/12	12/25	16/25	33/60	43/60
3	17/23	20/23	11/12	12/12	15/25	17/25	43/60	49/60
4	14/23	16/23	10/12	11/12	17/25	20/25	31/60	47/60
5	12/23	15/23	8/12	12/12	18/25	18/25	38/60	45/60
6	15/23	20/23	12/12	12/12	13/25	19/25	40/60	51/60
7	19/23	22/23	10/12	10/12	8/25	15/25	37/60	47/60
8	15/23	18/23	11/12	9/12	10/25	17/25	36/60	44/60
9	13/23	14/23	4/12	10/12	15/25	16/25	32/60	40/60
10	15/23	17/23	9/12	12/12	10/25	14/25	34/60	43/60
11	14/23	19/23	10/12	12/12	16/25	19/25	40/60	50/60
12	15/23	13/23	6/12	10/12	14/25	19/25	35/60	42/60
13	17/23	20/23	8/12	10/12	11/25	14/25	36/60	44/60
14	20/23	23/23	10/12	12/12	14/25	14/25	44/60	49/60
15	19/23	20/23	7/12	11/12	12/25	13/25	38/60	44/60
16	18/23	19/23	12/12	12/12	10/25	15/25	40/60	46/60

The analysis revealed that there is a difference in participants' pre- and post-language assessment test scores. The results suggest that participants who spent a total of 15 gameplay hours were seen to have improved English language test performance, as compared to their performance prior to the gameplay sessions. The analysis indicates that the substantial improvement in participants' test scores could be the result of their active participation in collaborative discussions during the gameplay sessions of Lost Ark, in which they were able to collaborate with peers and discuss test questions that relate to the MSQs that they needed to complete as part of the game's storyline.

The analysis further implies that participants who underwent the required gameplay sessions were seen to be able to develop better understanding on the four different English skills that were included in the language assessment test (refer Table 1), which are; (a) vocabulary knowledge, (b) reading comprehension, (c) synonyms and antonyms, and (d) the use of tenses. A possible rationale is that the questions and text passages included in the language assessment test are based on the situations and instances that participants had to experience during gameplay sessions to progress through the game's storyline. Therefore, it can be assumed that participants were able to actively recall the questions and text passages while completing the MSQs in Lost Ark, which then resulted in their involvement in discussions with peers on specific test questions or seeking clarification on the game's storyline. Consequently, participants who took part in these collaborative discussions were able to better understand the test questions, which in turn resulted in better English performance during the post-test.

These findings resonate with Shifang et al.'s (2021) study, whereby the researchers explored the effects of collaboration and peer-tutoring towards English learners' reading and speaking proficiencies. The results of the study demonstrate that collaborative activities do positively affect their English language proficiency. The learners were seen to develop reading comprehension and oral reading fluency due to the fact that their peers were able to provide adequate support in aiding others to practice or learn together through collaborative means that were implemented during classroom sessions (Shifang et al., 2021). The findings suggest that participants were seen to be able to discuss and learn from their peers through collaborative learning to improve their language proficiency, which corroborates the findings from the current study. This directly shows that learners' active engagement in collaborative discussions could play an important role in aiding them to discuss and learn from their peers to perform better in the post-language assessment test.

THE TPB INDEX READINGS OF ONLINE ESL GAME PLAYERS ON THEIR BEHAVIOURAL INTENTIONS TOWARDS COLLABORATIVE DISCUSSIONS IN GAMEPLAY SESSIONS

A plausible rationale to why participants were able to perform better in the post- language assessment test could be due to their positive behavioural intentions when engaging in collaborative discussions during gameplay sessions of Lost Ark. A quantitative approach was employed by using a set of 5-point Likert questionnaires modelled after the three constructs of Ajzen's (1991) TPB, with an aim to ascertain what participants think or feel about collaborating and discussing matters pertaining to the language assessment test with their peers during gameplay sessions. The TPB questionnaires were distributed to participants prior to their first gameplay session. The data in Appendix 2 demonstrate the sum of participants' scores and mean values for each section of the questionnaires that were calculated and labelled as TPB index readings.

Referring to Appendix 2, it can be seen that the majority of participants have scored relatively positive TPB index readings on all constructs of TPB, which are (a) attitudinal behaviour (AB), (b) subjective norms (SN), and (c) perceived behavioural control (PBC). The observation on the TPB index readings for the INT section seems to indicate that most participants demonstrated positive behavioural intention in engaging in collaborative discussions with other peers. The positive TPB index readings on Questions 8 and 10 from the INT section suggest that participants were able to exchange information among their peers to better understand the game's storyline, as well as strategising to complete the MSQs during gameplay sessions.

Similarly, the analysis demonstrates that participants did exhibit positive evaluations regarding their engagement in collaborative discussions. Participants with high TPB index

readings in AB were seen to have a greater tendency to engage in discussions with their peers during gameplay sessions. Additionally, the positive attitudes demonstrated by participants indicated that they may feel that they were able to improve their English language test performance through communicating and discussing in English, which is evident based on participants' positive TPB index readings on Question 2 of AB in the TPB questionnaires.

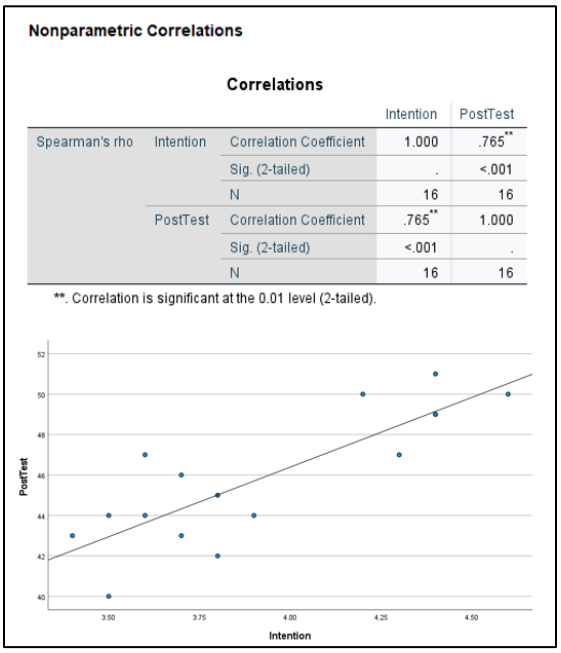
Despite that, the analysis of TPB index readings on the SN section reveals that while the participants of the study were inclined to adhere to the social norms of engaging in collaborative discussions with their peers, most remained neutral. The results suggest that some of the participants might felt the need to adhere to the social pressure, where they had to engage in discussions initiated by other players when completing MSQs in Lost Ark. Furthermore, it can also be assumed that these engagements in collaborative discussions during gameplay sessions could serve as opportunities for the participants to interact with their peers and exhibit a sense of belonging to their respective groups. Nevertheless, the analysis seems to point out that the majority of the participants felt that they were not affected by the social norms of engaging in collaborative discussions during gameplay sessions of Lost Ark, as they were not affected by the social encouragement or discouragement from their peers when engaging in collaborative discussions during gameplay sessions. The TPB index readings of P2, P9, P10, P12, and P13 for the SN section are relatively lower than those of the other participants of the study (refer to Appendix 2). Consequently, these participants may rely less on others' opinions or social norms to guide their behaviours, which further indicates that they have a stronger inclination towards making decisions or expressing opinions based on their personal beliefs and motivations.

In addition, the analysis of TPB index readings on the PBC section demonstrates that most participants were more likely to be motivated to engage in collaborative discussions during gameplay sessions. Based on the high TPB index readings for Questions 1 and 8 in the PBC section, it can be assumed that participants did feel confident that by engaging in collaborative discussions, they were able to accept advice and help from other peers to further improve their English language test performance during gameplay sessions. The high TPB index readings on PBC among participants also indicate that they had control in translating their behavioural intentions into actions. In line with the TPB index readings that reflect the participants' PBC, they were seen to engage more frequently in collaborative discussions with their peers during gameplay sessions. This result is in line with the findings of Yao et al.'s (2022) study, which demonstrated that cooperative learning aided English tourist guide learners to perform better in oral English proficiency. As learning behaviour involves social interaction, learners who experienced the process of learning English through verbal interactions with the use of multimedia technology managed to score higher post-test scores as compared to the control group of the study (Yao et al., 2022). The results of the study suggest that learners who engaged in collaborative activities with peers were more willing to communicate and get involved in social interactions using English as a medium of communication. Therefore, the findings from Yao et al.'s (2022) study resonate with the findings of the current study, whereby participants who have higher TPB index readings tend to be more favourable in engaging in collaborative discussions during gameplay sessions, in which they were seen to be able to practise the English language when interacting with peers. Consequently, participants who actively engage in collaborative discussions were seen to be able to discuss more frequently on test questions and understand the game's storyline, which could potentially reinforce their overall language performance in the post-language assessment test scores.

Based on the observation of data extracted from participants' language assessment test scores and TPB index readings, it can be assumed that the significant improvement in their English language proficiency might be linked to their active engagement in collaborative discussions during gameplay sessions of Lost Ark. As the sample size for this research consists of only 16 participants, a Shapiro-Wilk test was performed to detect normality of data collected of their TPB index readings based on their responses in the TPB questionnaires.

Based on the normality test, the p-values indicated a non-normal distribution of the data collected from participants' responses for each TPB construct in the TPB questionnaire, as the significance level for each question is less than 0.05. As indicated by the results from the Shapiro-Wilk normality test, it is crucial to address the non-normal distribution of data collected from participants' TPB index readings, as this could significantly impact the validity and reliability of statistical analyses. The p-values for each TPB construct of the 5-point Likert scale questionnaires suggested that the values were not evenly spread and did not follow the bell curve. Therefore, the assumptions of normality are not met. As the data is non-normally distributed, in order to accurately assess the strength and direction of the relationship between the two variables, a non-parametric test, Spearman's Rank Order Correlation, was employed.

A non-parametric test, Spearman's Rank-Order Correlation, was employed using Statistical Package for the Social Sciences (SPSS) to assess the possible relationship between participants' behavioural intentions (based on their TPB index readings) and the changes in their English post-language assessment test scores after the gameplay sessions of Lost Ark.



Nonparametric Correlations

Correlations

			Intention	PostTest
Spearman's rho	Intention	Correlation Coefficient	1.000	.765**
		Sig. (2-tailed)	.	<.001
		N	16	16
	PostTest	Correlation Coefficient	.765**	1.000
		Sig. (2-tailed)	<.001	.
		N	16	16

**. Correlation is significant at the 0.01 level (2-tailed).

FIGURE 4. Spearman's rho (ρ) value was assessed using SPSS on participants' TPB index readings (Intention) and the changes in their English post-test scores

The Spearman's rho (ρ) value for the Intention construct is 0.765, with a significance p-value of <0.01, indicating a positive linear relationship and statistical significance between the two variables.

Nonparametric Correlations

Correlations

			AB	PostTest
Spearman's rho	AB	Correlation Coefficient	1.000	.870**
		Sig. (2-tailed)	.	<.001
		N	16	16
	PostTest	Correlation Coefficient	.870**	1.000
		Sig. (2-tailed)	<.001	.
		N	16	16

**. Correlation is significant at the 0.01 level (2-tailed).

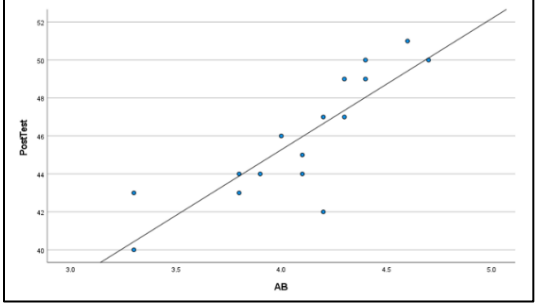


FIGURE 5. Spearman's rho (ρ) value was assessed using SPSS on participants' TPB index readings (Attitudinal Behaviour) and the changes in their English post-test scores

The Spearman's rho (ρ) value for the Attitudinal Behaviour construct is 0.870, with a significance p-value of <0.01, indicating a positive linear relationship and statistical significance between the two variables.

Nonparametric Correlations

Correlations

			SN	PostTest
Spearman's rho	SN	Correlation Coefficient	1.000	.896**
		Sig. (2-tailed)	.	<.001
		N	16	16
	PostTest	Correlation Coefficient	.896**	1.000
		Sig. (2-tailed)	<.001	.
		N	16	16

**. Correlation is significant at the 0.01 level (2-tailed).

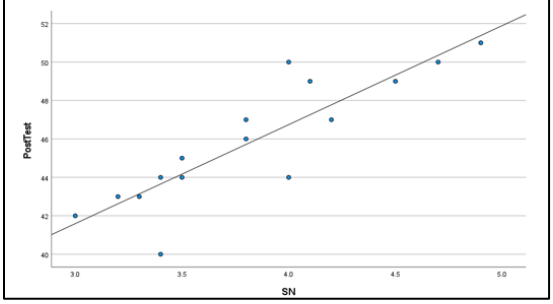
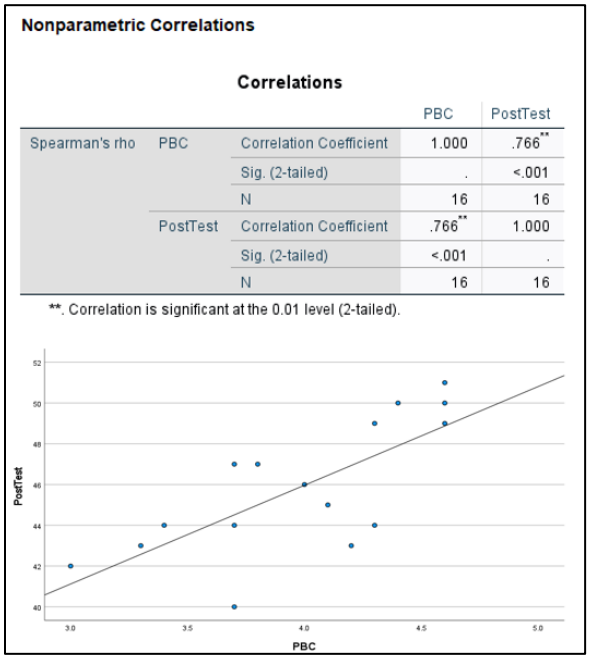


FIGURE 6. Spearman's rho (ρ) value was assessed using SPSS on participants' TPB index readings (Subjective Norms) and the changes in their English post-test scores

The Spearman's rho (ρ) value for the Subjective Norms construct is 0.896, with a significance p-value of <0.01, indicating a positive linear relationship and statistical significance between the two variables.



Nonparametric Correlations

Correlations

			PBC	PostTest
Spearman's rho	PBC	Correlation Coefficient	1.000	.766**
		Sig. (2-tailed)	.	<.001
		N	16	16
	PostTest	Correlation Coefficient	.766**	1.000
		Sig. (2-tailed)	<.001	.
		N	16	16

**. Correlation is significant at the 0.01 level (2-tailed).

FIGURE 7. Spearman's rho (ρ) value was assessed using SPSS on participants' TPB index readings (Perceived Behavioural Control) and the changes in their English post-test scores

The Spearman's rho (ρ) value for the Perceived Behavioural Control construct is 0.766, with a significance p-value of <0.01, indicating a positive linear relationship and statistical significance between the two variables.

The analysis of the study highlighted the Spearman's rho (ρ) values and p-values between participants' TPB index readings for each TPB construct and the changes in their English post-test scores after gameplay sessions of Lost Ark. The scatterplots demonstrated that as participants' TPB index readings on intention, AB, SN, and PBC increased, their English post-test scores also increased. Simultaneously, the significance of this correlation was also assessed using a two-tailed test, which yielded a p-value of < 0.01. Therefore, it implies that the positive values of ρ exhibited a statistically significant relationship between participants' TPB index readings and their post-test scores.

The positive relationship between the two variables also seems to suggest that participants viewed collaborative discussions during gameplay sessions of Lost Ark as a means for them to discuss the content of the game with other players to better understand the narrative context of the storyline and the questions in the language assessment test. This is evident based on the transcription excerpts taken from the video recordings of collaborative discussions that occurred between participants during the gameplay sessions.

Group 1 – Session 4

P1 [00:39:11]: Guys, **did Kharmaine "flee", or "fleeing"? I mean for the test**.

P2 [00:39:14]: You're asking what we answered in the test, or what?

P1 [00:39:17]: Yes, what did you guys put (answer) for this question?

(P2, P3, and P4 answered "fled")

P1 [00:39:30]: Oh no! I think I f***ed up this one as well. S***!

P4 [00:39:35]: **I think the sentence is in past tense. So that's why you have to use the past tense of flee**.

P3 [00:39:37]: Mhm… Past tense for flee is fled.

P1 [00:39:40]: **I just googled the word. Flee means "running away"**. I just found out about this word, d***.

Group 4 – Session 3

P14 [01:42:51]: Yeah, take your time. We're just gonna be here. There's a lot of talking afterwards anyway. Also, **I really need to sit down with you guys after this session.**

P13 [01:42:57] Is there anything you wanna discuss? About the test, I assume?

P14 [01:43:05] Yeah, **I need to study a little bit on Passage 3.** I feel like my grammar is s***, so **I might need some pointers from you guys**.

FIGURE 8. Examples of transcription excerpts transcribed from recordings of collaborative discussions during gameplay sessions

Figure 8 demonstrates two examples of instances where participants collaborated with other peers during the online gameplay sessions of Lost Ark. Based on the transcription excerpts, participants who engaged in collaborative discussions were able to exchange information about the game and test items related to the language assessment test with their peers during the gameplay sessions. A logical reasoning behind this could be due to the fact that since participants exhibit positive behavioural intentions towards collaboration in online games, they were more likely to utilise these sessions as group discussions to collaborate with other peers on questions presented in the language assessment test. Therefore, this data analysis suggested that since the content related to Lost Ark was featured in the language assessment test, it directly enticed participants to collaborate with each other, which inevitably led to their improved English language performance in the post-test.

The findings from the transcription, derived from the learners' collaborative discussions during the gameplay sessions, seem to corroborate with Vlachopoulos and Makri's (2017) study, whereby the findings on behavioural performance highlight that students involved in playing games collaboratively with their peers performed better in higher education settings. Students were seen to provide and receive meaningful feedback from their peers during game simulation, which

resulted in the reduction of their anxiety and uncertainty when engaging in game-based communication activities (Vlachopoulos & Makri, 2017). Similarly, in the current study, participants were seen to be able to effectively collaborate with their peers to recall passages and test questions that they deemed difficult to answer when completing the main story quests (MSQs) and attempting to understand the game's storyline. Additionally, learners were also seen to initiate discussions and seek additional assistance from their peers in an attempt to understand the questions in the language assessment test. Thus, it is suggested that collaborative discussions during gameplay sessions do have positive impacts on participants' language test performance.

IMPLICATIONS OF THE STUDY

The practical implications of this study suggest that integrating collaborative gameplay sessions into language learning environments can significantly enhance learners' engagement and performance. Participants with higher TPB index readings demonstrated a greater tendency to engage in peer discussions, which facilitated English language practice and improved understanding of test-related content. Educators and instructional designers can leverage collaborative gaming activities to create opportunities for meaningful peer interactions and foster a supportive environment for language practice. These findings underscore the potential of game-based learning as a tool to reinforce language acquisition, particularly when learners are encouraged to actively participate in discussions and provide constructive feedback to their peers.

Additionally, Hamat and Amran (2021) stated that MMORPGs have a great potential to offer educators and learners, whereby they can capitalise on informal language learning by designing classroom learning materials that draw on the language that ESL learners engage with in MMORPGs. In this case, the in-game collaborative discussions that capitalise on the interest of the ESL online game players in completing the main story quests act as a catalyst that pushes ESL learners to make use of their communicative competencies to interact with their peers. For instance, the ESL online game players in the present study were inclined to converse in the English language with their peers when they were attending to in-game tasks related to the main story quests. This is mainly attributed to the fact that much of the content in Lost Ark is only presented in English. Thus, the context related to the language environment of the game does influence the language use among the language learners during collaborative discussions. In addition, the incidental vocabulary learning that enables the ESL learners to enhance their lexical knowledge took place during collaborative discussions. In the case of the present study, these ESL online game players were initiating discussions by seeking help from their peers to understand, for instance, the questions in the language assessment test. A number of these ESL online game players were engaging with their peers to figure out the contextual meaning of English vocabulary during gameplay. Therefore, online games can potentially serve as a catalyst that drives language learners to collaborate with their peers to discuss the meanings of English vocabulary found during gameplay, which inherently stimulates their incidental vocabulary learning.

LIMITATIONS AND RECOMMENDATIONS

The limitation of this study is that it only involved a small sample size that focused on the impact of collaborative discussions in online games on their English language test performance. Furthermore, since only 16 participants were involved in the study, it is inadequate to establish that the collaborative discussions occurring during online gameplay contributed to enhancing the language test performance of online ESL game players. It is recommended for future studies to incorporate a bigger sample size in order 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 involving the English language when they engaged in collaborative discussions that took place during gameplay sessions of MMORPG. Such a revelation regarding the communicative competence of ESL online gamers may provide useful insights into how English language skills were applied in online interactions to facilitate effective information exchange.

CONCLUSION

With the advancements in teaching and learning technology, it is apparent that online games, if planned and incorporated accordingly into the language learning process, could benefit learners, whereby, via collaboration, they are able to discuss and learn from their peers. With proper planning and guidance, online games, specifically MMORPGs, could be utilised in the current educational context as a supplement to the current teaching and learning pedagogies. This could entice learners to participate in collaborative discussions and pave the way toward the integration of MMORPG in the language learning syllabus.

ACKNOWLEDGEMENT

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APPENDIX 1

SAMPLES OF ENGLISH LANGUAGE ASSESSMENT TEST ITEMS USED IN PRE- AND POST- TESTS

SECTION 1
Read **Passage 1** below and answer the following questions.

PASSAGE 1: MORAI – THE LOST KINGDOM

This is a story about a young priest named Armen who embarked on a journey to find the lost Ark, that is said to hold the power that could bring peace to the world. Unfortunately, Armen was also struggling with himself as he is a half human and half Delaine, a race that is able to possess demonic powers. However, this did not stop Armen in his quest to find the Ark and use it to defeat evil and restore balance to the world.

Armen was gathering clues regarding the Ark hidden by the king of Luterra. He suspected that the Ark was hidden in the lost kingdom of Morai.

While he was on his way to Yudia, Armen encountered people suffering from the **plague**. The people who have died were turned into undead creatures and started attacking other villagers. Consequently, the plague has spread to the border of Yudia.

Feeling sympathy for the border guards, Armen rushed to cure them. The guards told Armen that their **commander**, Abbot Levis, was heavily affected by the plague and in need of immediate help. After tracking and killing the demons that were causing the plague, Armen found a piece of jewel that possesses strong healing capabilities. He used it to treat Abbot Levis and proceeded to ask him about the Morai kingdom in Yudia, as it has been **rumoured** to contain clues in finding the lost Ark.

According to Abbot Levis, Morai was the capital of the Cavatian kingdom. However, it disappeared into the desert after being buried in the sand. Because of that, Abbot Levis suggested that the locals in Yudia might know more about what happened to Morai more than he did. With this information at hand, Armen proceeded to visit the **monastery** and received documents left by the **pilgrims** who was looking for the Ark. With the support of carriages provided by the border post, Armen arrived at the salt desert, Yudia.
Upon arrival, …

Samples of Questions for Section 1
Read **Passage 1** and complete the summary below.

Please **circle** or **tick** the correct answer. You can only choose **ONE** answer for each question.

Armen sought for information regarding the Ark hidden by the king of Luterra. (1) _____ , his journey was disrupted as he stumbled upon a group of people who was infected by a (2) _____. After healing the guards, he rushed to defeat the demons and (3) ____ the commander, Abbot Levis, who then suggested him to talk (4) _____ the locals of Yudia about the Morai kingdom.

Following the commander's order, Armen found and examined an (5) _____ that led him to the lost kingdom of Morai. After defeating Tanatos, …

(1)	(2)	(3)	(4)
A. Luckily	A. power	A. healed	A. to
B. Therefore	B. misinformation	B. killed	B. with
C. However	C. death	C. heals	C. against
D. Thus	D. plague	D. kills	D. from

(5)
A. rusty tombstone
B. shiny gravestone
C. old tablet
D. enigmatic portal

APPENDIX 2

VALUES OF PARTICIPANTS' TPB INDEX READINGS BASED ON THEIR SCORES IN TPB QUESTIONNAIRE

P	Intention (INT)										Attitudinal Behaviour (AB)										Subjective Norms (SN)										Perceived Behavioural Control (PBC)									
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
1	5	5	5	5	5	5	4	4	4	4	5	5	5	4	5	4	5	4	5	5	5	4	5	5	5	5	5	5	3	5	5	5	4	5	5	5	5	5	2	5
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14	4	5	5	5	5	5	3	4	3	5	5	4	4	4	4	5	5	4	5	4	4	5	4	5	5	5	4	4	4	5	5	4	4	5	4	5	5	5	4	5
15	4	4	5	5	3	4	3	3	4	4	4	5	3	4	3	5	4	4	5	4	4	3	5	4	4	3	4	4	4	5	4	5	3	4	4	5	5	5	4	4
16	4	4	3	3	3	4	4	3	4	5	3	4	4	4	4	5	4	5	3	4	3	4	4	4	3	3	4	4	4	5	5	3	4	4	4	4	4	5	3	4

TPB Construct	Mean Values of Participants' TPB Index Readings ($\bar{x}$)															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Intention (INT)	4.6	3.4	4.4	4.3	3.8	4.4	3.6	3.5	3.5	3.7	4.2	3.8	3.6	4.4	3.9	3.7
Attitudinal Behaviour (AB)	4.7	3.3	4.3	4.3	4.1	4.6	4.2	3.8	3.3	3.8	4	4.2	3.9	4.4	4.1	4
Subjective Norms (SN)	4.7	3.3	4.1	4.2	3.5	4.9	3.8	3.5	3.4	3.2	4.4	3	3.4	4.5	4	3.8
Perceived Behavioural Control (PBC)	4.6	3.3	4.3	3.8	4.1	4.6	3.7	3.7	3.7	4.2	4.4	3	3.4	4.6	4.3	4