Exploring the Impact of Artificial Intelligence (AI-based) English Games in Enhancing English Communication Skills among Indonesian L2 Generation Z

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Authors' contributions

This work was carried out in collaboration between both authors. Author CECC designed, analyzed, interpreted and prepared the manuscript. Author WC collected the data, and helped develop the literature review. Both authors read and approved the final manuscript.

Original Research Article

ABSTRACT

The role of artificial intelligence (AI-based) English games in enhancing English communication skills among Indonesian Generation Z (Gen-Z) for whom English is a second language (L2), is the main focus of this study. Questionnaires to collect data consisted of both open and closed-ended questions. Seventy-eight Indonesian Gen- Z from different parts of Indonesia participated, and provides a strong representation of the country. This study is aimed to address a gap in the present literature by directly engaging with game players and examining their perspectives and experiences with actual games that they play for enjoyment rather than games designed for educational

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purposes. The study's findings show that English AI-based games significantly help respondents develop their vocabulary, improve comprehension, and acquire confidence in English speaking. The findings also indicate that English AI-based game learning is favoured over traditional methods. The respondents noted gaming's immersive and interactive aspect as beneficial to language acquisition and skill development. These findings emphasise the transformative potential of English AI-based games in language learning and advocate for their integration into educational frameworks to better fulfil the needs of L2 learners, particularly Gen-Z.

1. INTRODUCTION

In a rapidly changing world where technology plays a central role in our daily lives, the combined power of education and artificial intelligence (AI) has paved the way for new and engaging learning strategies. Artificial intelligence (AI) is described as a technology that enables machines to act and think in more 'human' ways. AI may be utilised for a wide range of applications, including gaming.

According to Urwin [1] AI in gaming refers to artificial intelligence that drives responsive and adaptable behaviour in video, computer, and mobile games. A popular example is AI controlling non-player characters (NPCs), which are frequently sidekicks, allies, or adversaries of human users and adjust their behaviour to adapt properly to human players' activities. NPCs expand the range of discussions and actions available to human gamers by learning from interactions and modifying their behaviour. Artificial intelligence is also utilised to create gaming environments, changing the terrain based on a human player's decisions and actions. As a result, AI in gaming involves players in worlds with complex surroundings, flexible storylines, and lifelike characters. *Mobile Legend* is named as one of the popular games that uses AI [2].

Indonesia has the largest player base in Southeast Asia for AI-based games using video, computer, and/or mobile application, making it an important gaming market to examine. In 2022, the number of Indonesian gamers reached 185 million, substantially outnumbering neighbouring nations [3].

This study is aimed to investigate the impact of English AI-based games on improving English communication skills among Indonesian Gen-Z whose first language is not English. The objectives of the research are as follows:

1. To investigate the role of English AI-based video/computer/mobile games in enhancing English communications skills, with a focus on vocabulary acquisition and comprehension among Gen-Z players, as well as boost confidence.

2. To investigate the perceived advantages and disadvantages of using English AI-based video/computer/mobile games as a language learning aid vs traditional approaches, such as classroom instruction, and how views shifts among players.

The research objectives are achieved by answering a number of following questions:

1. How do English AI-based video, computer, and mobile games contribute to the enhancement of English communication skills, with a focus on vocabulary acquisition, comprehension among Indonesian L2 Gen-Z, and confidence gain?

2. What are the perceived advantages and disadvantages of using English AI-based video/computer/mobile games as a language learning aid against traditional approaches, such as classroom teaching, and how do these impressions differ across players?

This study seeks to fill a research gap in the limited existing literature on the subject. While many studies have looked at the potential of AI games as educational aids [4,5,6], there is a scarcity of research that directly connects with the perspectives and experiences of people who actively participate in gaming in real-life setting. Moreover, studies on the use of gaming in the classrooms frequently focus on classroom games [7] rather than real-life games that people play in their daily lives, in natural context. Understanding the perspectives of game players is critical for developing a thorough understanding of the mechanisms by which these games contribute to English language acquisition. By addressing this research gap, this study aims to bridge the current knowledge gap and give significant

insights on the impact of video/computer/mobile games in English language acquisition among L2 Gen-Z in Indonesia.

2. LITERATURE REVIEW

In modern education, there has been a great deal of attention on using games to educate and learn [8,9,10]. This is because AI-based solutions provide new opportunities for improving language acquisition and communication abilities. Previous studies have shown that by immersing learners in real-life linguistic setting, AI- based games can aid with vocabulary development, listening comprehension, and gain confidence. Thompson [11], Wu & Huang (2017), and Clark et al. [8], in their study on how effective game-based learning are to enhance vocabulary in English as a Second Language (ESL) context, discovered that digital games can facilitate learning in a variety of context. It includes assisting speakers of other languages in developing their English vocabulary acquisition.

Other studies also suggest that AI-based video, computer, and/or mobile games provide authentic environments for language learning, allowing players to develop and test their English language skills [12,13]. Thus English AI-based games have emerged as a promising method to enhance English communication skills among Generation Z (Gen-Z), supported by various researches that have investigated the effectiveness of such games as a language learning aid [14,15]. As Gen-Z grows up in a digital age, also known as digital native generation [16,17], using AI- based English games might bring novel ways for improving language skills in this group.

Although the potential of AI-based language learning games is high, there has been little study done to examine their influence on Indonesian L2 Gen-Z. Much of the existing material focuses on broad AI applications in education or the efficacy of language games in controlled settings [18,19,20]. The current study seeks to fill this gap by investigating the perspectives and experiences of Indonesian L2 Gen-Z with AI-based English games, specifically how these games can improve their English communication skills.

3. METHODOLOGY

3.1 Methods

This study uses a qualitative descriptive method to investigate the impact of AI-based English games on improving English communication skills among Indonesian L2 Gen-Z. The use of this method enables an in-depth examination of players' viewpoints and experiences with AI-based games in natural situations. Descriptive qualitative study aims to provide a description of respondents' narratives and observations, reflecting the intricacies and complexity of their experiences with English language gaming. This method allows the researchers to acquire a more comprehensive picture of the respondents' learning experiences. It also offers insight on the possible benefits and drawbacks of employing AI- based games for English language acquisition.

3.2 Respondents

This study's respondents are Gen-Z. This age group is chosen as the target demographic of this research because they are known as a digitally native generation who are the avid users of AI-driven language learning tools. Their technical knowledge, adaptability, and familiarity with technology all contribute to their experiences with AI-based games. Furthermore, understanding the importance of English proficiency in global communication and collaboration is crucial for this generation, particularly given that they will be Indonesia's future leaders. There were 78 Indonesian respondents aged 16 to 27 who consented to answer the survey questions.

3.3 Data Collection

The data for this study was collected through a comprehensive survey. The survey comprised a mix of closed-ended and open-ended questions. The survey was made accessible online through Google Form, and responses were gathered for one month from 17th December 2023 to 17th January 2024. The obtained data underwent qualitative analysis, allowing for a more comprehensive assessment of the survey results.

The respondents were asked to answer 18 questions in both closed and open-ended formats. Seven of these questions were on demographic information, such as the respondents' age, sex, city of origin, occupation, language preference for gaming (English or non-English), length of gaming experience, and frequency of playing games. The subsequent eleven questions probed respondents' thoughts on the importance of

English video, computer, and/or mobile games in improving their English communication skills. These questions covered a range of topics, including the specific titles of games they play, their motivations for gaming, the extent to which their vocabulary and comprehension skills have improved through gameplay, examples of English words learned from games, and reflections on how gaming contributes to their overall English proficiency. Respondents were also encouraged to share personal experiences highlighting how gaming enhances their self-confidence in English communication, compare the benefits of learning English through gaming versus traditional methods, and identify specific game features that promote English language acquisition. This comprehensive strategy sought to elicit subtle insights on the relationship between gaming and English language enhancement among the surveyed Indonesian Gen-Z.

4. FINDINGS

Out of the 78 respondents who accepted to participate in this survey, 80.3% are between the ages of 18 and 20; 16.7% of respondents are between the ages of 21 and 24; and 1.3% are 17 or younger, and only one responder falling between the ages of 25 and 27. None of the respondents to the survey are native English speakers. They speak Indonesian as their primary language. Furthermore, their mother tongues are local languages in their own regions.

The study comprised a balanced mix of respondents from both sexes, with 46.2% identifying as female and 53.8% as male.

In terms of educational background, 77 of the 78 respondents who agreed to participate in this survey are college/university students, while one is a freelancer. They are from different parts of Indonesia, representing four of the five largest island in Indonesia.
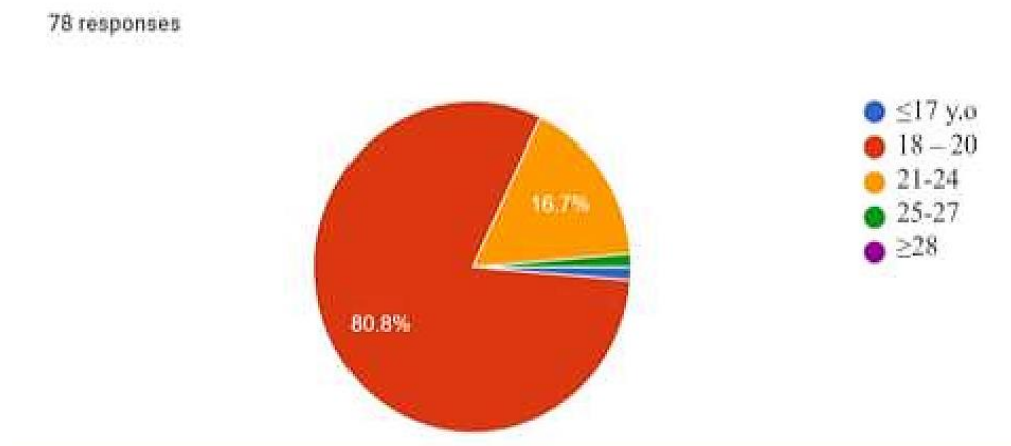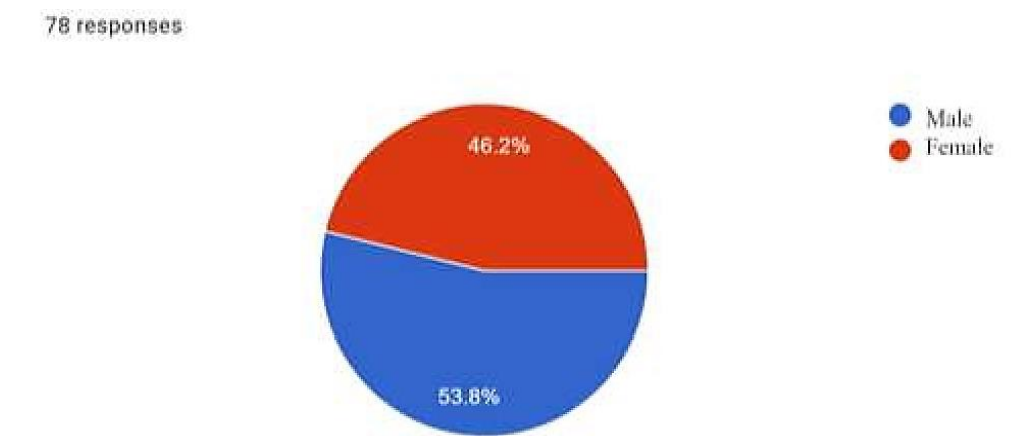
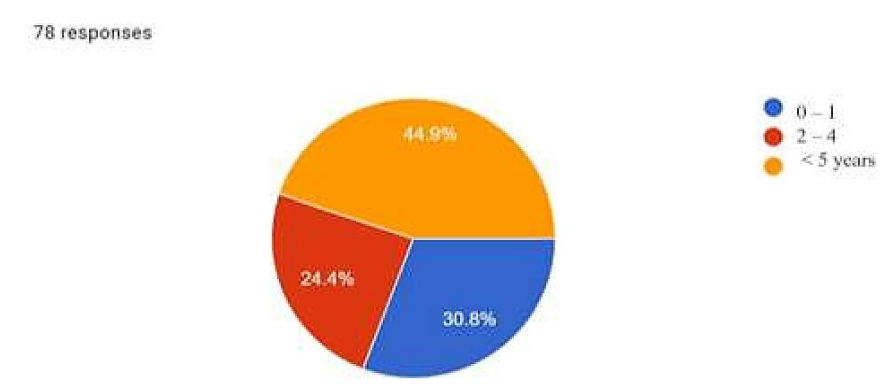

Fig. 1. Age of respondents

Fig. 2. Sex of respondents

78 responses

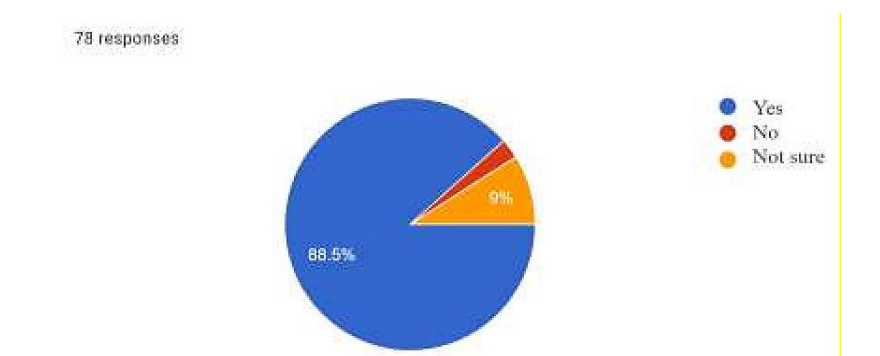**Fig. 3. Length of gaming experience**

78 responses

Fig. 4. Whether English AI games increase their English vocabulary
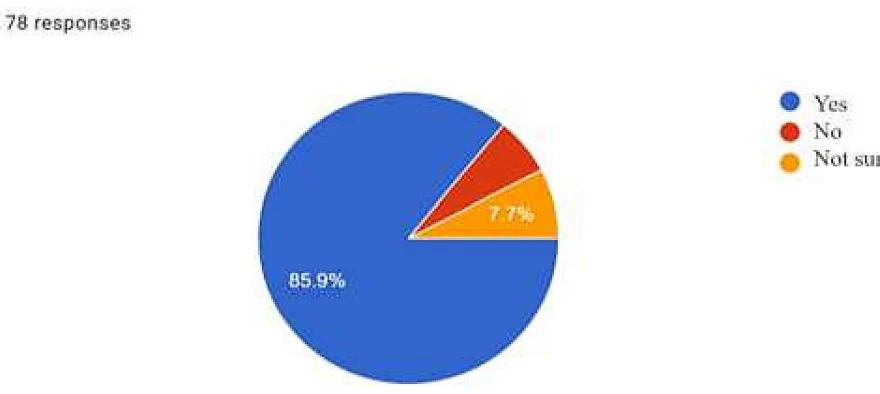
78 responses

Fig. 5. Whether English AI games increase their English comprehension

The 78 respondents reported a variety of gaming experience lengths. A sizable proportion or 44.9%, reported playing video games for more than five years. Furthermore, 24.4% of respondents claimed that they had been playing for two to four years. 30.8% of espondents stated that their gaming experience began within the last year or less.

When questioned about the influence of English AI games on their English vocabulary, 88.5% of respondents, a total of 69 individuals, affirmed an increase.

Only 9% of respondents indicated uncertainty about the impact of gaming on their English vocabulary. In contrast, only 2.6% of respondents reported no apparent gain in their English vocabulary as a consequence of games.

In answer to the question on the influence of playing English AI-based games on their English

comprehension abilities, a significant 85.9% of respondents, totalling 67 people, reported an improvement. In contrast, a small proportion of respondents (7.7%) indicated doubt about the impact of gaming on their comprehension abilities. Only 6.4% of respondents reported no apparent increase in their English understanding as a result of games.

The respondents' responses to the question about the AI-based games they play reveal a broad spectrum of gaming preferences. It is shown on Table 1, the 35 different games mentioned by the respondents. The popularity of the games varies, with some of them played by as many as 33 respondents, while others are engaged in by only a handful of players, including games played by six, four, three, two, and even one respondent.

Through their participation in video games, respondents were asked to indicate the vocabulary they acquired. Table 2 shows the word class that respondents indicated they learned from the English AI-based games:

Table 1. Games played by the respondents

No	Name of games	Times mentioned
**English AI-based mentioned by the respondents**		
1	Action	33
2	Simulation	33
3	Mobile Legend	18
4	Duolingo	6
5	Valorant	4
6	Sky	4
7	The Sims	4
8	Genshin impact	3
9	Clash of Clans (COC)	3
10	Player Unknown's Battlegrounds (PUBG)	3
11	Elder Scrolls	2
12	Call of Duty	2
13	Minecraft	2
14	Roblox	2
15	Arknights	2
16	Sandbox	2
17	Arknights	2
18	Strategy	2
	Makeup	2
19	Mystery of Unicorn Castle	1
20	Burger Shop	1
21	Temple Run	1
22	Zelda	1
23	Resident Evil	1
24	League of Legends	1
25	Need for Speed	1
26	Motorsport Manager Mobile	1
27	SM Town Superstar	1
28	WOW	1
29	Zenonia	1
30	Real Racing	1
31	Coral Island	1
32	Stumble Guys	1
33	Gacha	1
34	War Thunder	1
35	Terraria	1
	Total	**146**

Table 2. The vocabulary acquired by the respondents

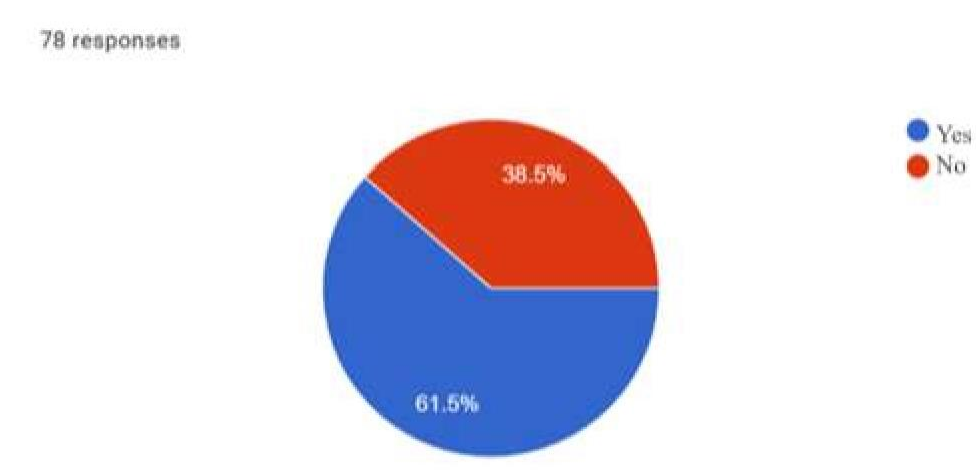| No	Word Classes	Times mentioned
1	Noun	23
2	Verb	53
3	Adjective	4
4	Adverb	-
5	Phrases and expressions	19

78 responses

Fig. 6. Whether they feel that learning English through AI-based games is more helpful than traditional techniques

The large majority of the respondents indicated that playing English AI-based games boost their confidence in communicating in English. As many as 68 respondents (87%) shared their experience on how playing the games boost their confidence. Only 10 respondents (13%) chose not to answer this question by filling the Google form with a dash (-) for this question.

When questioned whether the respondents feel that learning English through AI-based games is more helpful than traditional techniques, a large percentage of respondents (61.5%) feel that learning English through AI-based video, computer, and/or mobile games is more helpful than traditional techniques such as classrooms or courses. In contrast, 38.5% of respondents believe that conventional approaches are more effective or desirable for English language acquisition.

5. DISCUSSION

The purpose of this study is to look at the influence of English AI-based games on enhancing English communication skills among Indonesian Gen-Z whose English is not their first language. There were 78 Gen-Z who volunteered to participate in this study, 36 females and 42 males. This near-equitable distribution ensures a comprehensive understanding of viewpoints across genders, and allows for an inclusive analysis among Indonesian Gen-Z. Such a representative group is crucial for capturing the full spectrum of attitudes and behaviors within this demographic. By considering the input from both sexes in equal measure, the study's conclusions are well-rounded, potentially providing insights into the distinct ways in which each gender interacts with the research subject.

The respondent's educational background demonstrates the respondent's academic bent. With 77 out of 78 being university students and one being a freelancer, is significant for this research. English is an important language in academic setting in Indonesia, so university students will encounter it frequently in their studies. Their engagement with English AI-based games may thus improve their capacity to access a wider range of academic materials and communicate more effectively in global environments. For the freelancer, English competence might lead to worldwide collaboration and networking opportunities.

The respondents of this study come from different parts of Indonesia. Four out the five major islands of Indonesia, namely Java, Sumatera, Kalimantan/Borneo, Sulawesi are represented by the respondents, with Java accounting for the vast majority (78%). This broad representation contributes to the study's understanding of the attitudes and experiences of Indonesian Gen-Z across the country.

The survey results indicated that the 78 respondents played a wide variety of English games, with clear preferences across genres. Action games were the most popular choice, with 33 respondents expressing interest in this area. Similarly, 33 respondents said they played simulation games, indicating a common interest in immersive virtual experiences. *Mobile Legend*, a famous mobile multiplayer online combat arena game, also received a lot of attention, with 18 respondents actively playing it. Furthermore, 6 respondents stated their participation in *Duolingo*. This indicates that there is a subgroup of respondents who are interested in educational gaming platforms. These survey findings found that respondents loved a wide range of video game titles, reflecting the diversified gaming environment among the Gen-Z. While some respondents identified specific titles like *Call of Duty, Valorant, Clash of Clans* (COC), and *Player Unknown's Battlegrounds* (PUBG), others indicated a diverse variety of games from other genres. The diversity of gaming interests was clear, from strategic games to casual titles like *Mystery of Unicorn Castle* and *Burger Shop*, as well as iconic brands like *Temple Run* and *Zelda*. Furthermore, mentions of games like *League of Legends, Need for Speed, Minecraft*, and *Roblox* demonstrate the appeal of multiplayer and creative settings. Focused titles such as *Motorsport Manager Mobile, Arknights*, and *SM Town Superstar* were also indicated. This broad list demonstrates the many preferences and interests of Gen-Z gamers, emphasising the breadth and complexity of modern gaming culture.

The survey findings show that the majority of respondents had lengthy gaming experience, implying that they are avid gamers. Most respondents (44.9% or 36) stated that they played video games for more than five years, and 24.4% or 19 respondents, claimed that they had been playing for two to four years. Only 30.8% or 23 of respondents stated that their gaming experience began within the last year or less. This considerable experience suggests a strong familiarity with gaming settings and mechanisms, which may contribute to their ease and proficiency in navigating English-language games. Their continued involvement with games over multiple years may also indicate a strong interest in and dedication to the gaming culture, which provides several chances for immersive language acquisition and skill improvement. Long-term exposure to English games may improve their language abilities, such as vocabulary acquisition, comprehension, and communication skills, in the context of gaming.

Respondents' motives for engaging with video games are also diverse. This reflects a variety of needs and interests. For a large majority of respondents (77%), the key draw of AI games is their ability to get entertainment and enjoyment. Further, 74% of respondents emphasised gaming's educational potential, recognising the ability to learn while engrossed in games. 53% of respondents identified simplicity and accessibility as essential elements, emphasising the significance of ease of use in their gaming experiences. In addition, 33% of respondents cited the attractiveness of free-to-play games, emphasising the importance of cost in their gaming decisions. A tiny fraction of responders, 5% in total, mentioned the cost- effectiveness of games as a motivator for their involvement. Other respondents listed occupying idle time as another reason for playing video games. These findings highlight the complex character of AI game involvement, which includes components of enjoyment, learning, accessibility, and cost, in addition to meeting leisure and time-filling demands. It is crucial to note that for this question, responders may provide more than one explanation.

In answering to the question regarding the impact of English AI-based games on their English vocabulary, 88.5% of respondents, a total of 69 people, reported an increase. This vast majority suggests that gaming is an excellent approach for language development among Gen-Z respondents. 9% of respondents were unsure about the effects of gaming on their English vocabulary. Only 2 respondents reported no noticeable increase in their English vocabulary as a result of gaming. These findings emphasize the significance of English video/computer/mobile games in developing language abilities, notably the expansion of English vocabulary among the studied demographic.

In response to the question about the impact of playing English AI-based games on their English

comprehension abilities, 67 out of 78 respondents claimed an improvement. This significant majority demonstrates that gaming improves English comprehension among the surveyed Gen-Z. A small number of respondents, six respondents, expressed scepticism regarding the influence of gaming on their comprehension abilities. It shows some ambiguity among a minority of participants. Only five of the respondents reported no noticeable improvement in their English comprehension as a result of gaming. The data shows a largely positive trend, with the great majority recognising the benefits of gaming for English learning, but a minority report varying levels of efficacy.

Through their participation in video games, respondents displayed a wide spectrum of vocabulary acquisition. Verbs were the most often cited vocabulary category, with 53 instances recognised. The most often verbs used that are indicated by the respondents are words like "play," "buy," and "attack," emphasising the dynamic nature of gaming encounters. Verbs may be the most commonly learnt vocabulary among responders due to the interactive and action- oriented character of the games. Games frequently demand players to do a variety of activities, including as moving, attacking, interacting, and fulfilling objectives. These in-game activities need the use of verbs to navigate and comprehend the gaming mechanics. Furthermore, many

games provide orders and instructions based on action phrases that guide players through the following steps. This constant exposure to verbs not only helps players comprehend the game's immediate requirements, but it also reinforces their knowledge and use of these terms in context.

Nouns followed, with 23 occurrences of diverse things, concepts, and creatures in gaming situations. Additionally, 19 phrases and expressions were recorded, including greetings, strategic directives, and theme components from certain games. Furthermore, respondents mentioned four adjectives that they learned, that describe character qualities or game aspects.

The respondents' comments demonstrate a wide range of ways in which English video/computer/mobile games may help them improve their English listening and speaking skills. Respondents reported improved English ability as a result of gaming-related activities

such as conversation options, interacting with other players, and comprehending game instructions. Many respondents mentioned that playing English AI games provided immediate benefits such as exposure to conversational English, pronunciation practice, and vocabulary growth. Additionally, the use of subtitles, listening to character speech, and frequent exposure to spoken English improved comprehension and pronunciation abilities. The need to acquire English for game progress, communicating with overseas players, and navigating game interfaces emphasised language acquisition. Respondents also emphasised the need of adding English AI games into language learning routines, as well as the practical use of resources such as online chat and phone communication. These diverse replies indicate the importance of English video/computer/mobile games in creating immersive language learning experiences and promoting language skill development among players.

Some of the responses given by the respondents are as follows:

> *"Playing game in English let me understand the context through the pictures and visual and audio and help me increase my vocabulary and listening ability as well as reading and pronunciation."*

> *"After acquiring unfamiliar vocabulary, besides looking up the meaning, there is a curiosity to pronounce it correctly."*

> *"When playing online games with people from other countries, it necessitates us to be able to speak English as the universal language."*

The respondents claim that playing English games boosts their self-confidence in speaking English in a variety of ways. Many of the respondents reported that exposure to English phrases and accents in games improved their comprehension of difficult terms and varied English accents, enhancing their confidence in understanding English discussions outside of the gaming setting. Furthermore, regularly conversing with other players in English and learning new language during games were identified as variables related to improved confidence in speaking English. The interactive aspect of games, particularly those featuring dialogue options, allowed players to practise conversational English and make decisions that

affected the game's plot, resulting in a greater sense of engagement and confidence in using English. Additionally, exposure to English language and voice acting in games improved pronunciation and communication abilities, which increased confidence in speaking English. Overall, the respondents' different experiences highlight the importance of English games in boosting self-confidence in speaking English through immersive and interactive language learning opportunities.

The following are some of the responses given by the respondents:

> *"Besides expanding my vocabulary, I also understand how to pronounce English words, so I feel more confident when speaking."*

> *"I am confident because the words are already provided in the game, so I just need to choose according to the situation."*

> *"The video games I play mostly require a competent team to win. Therefore, I usually use additional applications like Discord because in that app, I can find a team that meets the criteria of a 'good' team. I often encounter team members who are not Indonesian citizens, so we usually communicate in English. Through this experience, I gradually become more confident in speaking English."*

According to the study's findings, a substantial proportion of respondents (61.5%) believe that learning English through video, computer, and/or mobile games is more effective than traditional methods such as classrooms or courses. This implies that the majority of participants feel that interactive digital platforms are a more engaging and effective way to learn a language. In comparison, 38.5% of respondents felt that traditional methods are more effective or desired for English language learning.

The participants' responses highlight several major reasons why games are seen to be more successful as English language learning tools than traditional approaches. One key feature is the use of audio aspects in games, which introduce players to new words via sound media, assisting with pronunciation and vocabulary development. The interactive element of games, especially when players may pick dialogues that effect the plot, increases engagement and helps conversational English practice. Furthermore,

tasks included in games, such as solving riddles or completing missions, offer educational challenges that enhance language learning experiences. The repetitious nature of games also helps with retention, since players face English instructions again. The rapid feedback offered by games also improves knowledge of English terminology and instructions, encouraging active learning. The simplicity and availability of gaming platforms add to their efficacy, since they provide an accessible and engaging medium for language acquisition, particularly for people who find traditional classroom settings less appealing. Thus gamification of language learning promotes immersion while also making the process pleasant and successful for students of all ages.

The following are some of the responses given by the respondents:

> *"Playing game is exciting and fun that it makes people don't want to stop playing. If that continues, people will get used to the terms used in the game and learn without being forced to."*

> *"Through choosing our own storyline in some simulation or roleplaying games, this not only fosters creativity but also freedom of expression, specific interactions, and enjoyment. This is the plus point compared to teaching with traditional methods. "*

> *"Quests within games that utilize English, searching for information within the game, and interacting with non-playable characters. These aspects help me improve my English skills while engaging in exciting gameplay."*

6. CONCLUSION

The study looked into the role of English AI-based video/computer/mobile games in helping Gen-Z improve their English communication abilities, with the goal of answering a few crucial questions. The study and interpretation of the respondents' comments revealed that these games play an important role in enhancing English language ability. The findings demonstrated that the majority of respondents saw English AI-based games as beneficial instruments for expanding vocabulary, improving understanding, and increasing confidence in English communication. Furthermore, the study found that Gen-Z prefers game-based learning over traditional approaches, with gaming's

immersive and interactive nature serving as a catalyst for language acquisition and skill development. Overall, the study gave information on the transforming potential of English games in building language ability and confidence among youth.

The study provided light on the transformational potential of English AI-based games in building linguistic competency and confidence among young learners, emphasising the importance of further investigating and incorporating gaming platforms into language teaching programmes.

CONSENT

As per international standards or university standards, respondents' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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