



Exploring the Potential of Metaverse as a Future Learning Platform for Enhancing EFL Learners' English Proficiency*

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ABSTRACT

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The aim of this study was to focus on describing how different learning platforms (traditional and Metaverse) may influence learners' English proficiency. To investigate whether the experience of a Metaverse environment can be favorable for speaking practice, forty-five students were divided into two groups: traditional and Metaverse. During the semester, students in the traditional group practiced speaking English in offline classrooms, while those in the Metaverse group exercised speaking English in a Metaverse environment. According to the findings, both groups significantly improved their English proficiency within the group, but there were no significant differences between the two groups. In terms of students' perspectives, the advantages and disadvantages of the Metaverse learning platform shed light on how they perceived using it for learning English speaking. The results of this study also suggest pedagogical implications and insights for future research.

KEYWORDS

Metaverse, students' perspectives, English proficiency, ifland, virtual learning

1. Introduction

According to the Google Trends index, one of the most frequently searched terms in 2022 was Metaverse. This term was first used by Neal Stephenson in 1992 in his novel 'Snow Crash' (Grimshaw 2014). As reported by Aydin (2022), this science-fiction novel not only introduced the term Metaverse but also inspired pioneers to build its platforms. Moreover, it also led to the development of other platforms, such as Adobe Connect, Microsoft Teams, and Zoom, designed to promote virtual interaction, communication, and collaboration.

Metaverse, a combination of technology and reality, refers to an immersive online environment that requires augmented reality (AR) and virtual reality (VR). In this virtual world, users can work, study, shop, visit art galleries, attend concerts, and play games. With their virtual identities, users can also meet others, make friends, and build social connections and relationships. In other words, they can interact, share experiences and thoughts, and work together with each other, synchronously but anonymously in the virtual environment using avatars they have created.

Considering that Metaverse facilitates interaction, communication, and collaboration, it can be seen as an effective language learning environment (Aydin 2022). Since this virtual world requires social interactions among individuals, it can provide language learning opportunities in communicative and interactive contexts. According to Aydin (2023), language learners can raise awareness of the language and culture in the virtual environment through increased exposure to comprehensible input, meaning negotiation, and output. In addition, they can develop their problem-solving and critical-thinking skills by discovering and constructing language. Through active discussion, learners can also improve their motivation to learn the language more independently and collaboratively. Consequently, the Metaverse provides language learners with learner-centered environments that facilitate autonomous and collaborative learning (Aydin 2023).

According to Imaoka et al. (2012), the use of Metaverse offers three benefits for foreign language learning. Firstly, learners can create their own avatar to represent themselves, which allows them to maintain anonymity and have anonymous interaction. This can help introverted or shy students to become more active and interactive learners. Secondly, learners can engage in role-playing in various situations in Metaverse, enabling them to practice their speaking skills in scenarios they may encounter in real life. Unlike static conversations, their interactions are dynamic, natural, and resemble real-life conversations. Thirdly, learners can study remotely and interact with students from other countries beyond the classroom walls, thus acquiring communication skills with people from different parts of the world using advanced technology.

In particular, Bae et al. (2022) argued that Metaverse enables English as a foreign language (EFL) students to improve their digital literacy and motivation in English learning. According to the authors, Metaverse offers EFL students with an authentic English language learning experience, with the advantage of not having any time-space restrictions. This, in turn, helps students to improve their oral communication skills in English. Imaoka et al. (2012) also claimed that EFL learning requires specialized virtual environments, especially for students who are physically separated from native-speaking communities. If foreign language learners only study their target language in a traditional classroom, they may not gain practical effectiveness in foreign language speaking. Therefore, to build adequate fluency in the target language, it is essential to have a setting where students can practice their speaking. From this perspective, Metaverse can provide unique opportunities for EFL teaching and learning (Aydin 2023).

According to Imaoka et al. (2012), EFL students can also benefit from anonymity in the Metaverse. Using

avatars in a virtual world may reduce the students' level of anxiety and embarrassment. The learners can also realize the value of learning a language, increasing their self-confidence as they see their own progress. Similarly, Bae et al. (2022) reported that EFL students are highly interested in Metaverse-based language learning. With the benefits of gamification and edutainment, the Metaverse can be an effective educational platform (Hwang 2022). EFL teachers also have a positive view of the virtual environment. In summary, it seems that Metaverse-mediated EFL learning is effective (Bae et al. 2022). It can be said that EFL learners benefit from using Metaverse as a language learning tool (Aydin 2022).

We are moving towards more fully realized Metaverse technologies for EFL learning (Imaoka et al. 2012). Nonetheless, the question of whether Metaverse is useful for foreign language learning remains unanswered. According to Aydin (2022), concerns can arise regarding the use of Metaverse as an effective foreign language learning platform. For example, it needs to be clarified whether Metaverse can be utilized as a language learning platform in light of current theories, models, and approaches. Therefore, it should be carefully investigated whether Metaverse can be effectively used for foreign language learning on a theoretical basis.

López-Belmonte et al. (2023) pointed out that the use of Metaverse in education is in its infancy, and more experiments and research studies should be conducted at all educational levels and populations to evaluate its impacts on learning and improve its effectiveness. Regarding foreign language learning, Aydin (2022) also noted that an in-depth and better understanding of Metaverse is required. After gaining a deeper understanding of Metaverse, the rationale needs to be established for its implementation and practice as a foreign language learning platform. In particular, Bae et al. (2022) added that there is a lack of research on the use of Metaverse in light of EFL education. It is necessary to examine whether Metaverse can play a beneficial role for EFL learning. Thus, the current study aims to confirm the effects of utilizing Metaverse on EFL students' academic achievement. This study also aims to provide insights into the use of Metaverse in EFL classes by showing its positive and negative aspects from the students' perspective.

The research questions are as follows:

1. Are there any differences in English proficiency between students who learn English using a traditional method and those who use the Metaverse learning platform?
2. What are students' perspectives of using the Metaverse learning platform?

2. Literature Review

To provide a theoretical framework for the use of Metaverse in foreign language learning, Aydin (2022) presented its contextualization as a language learning environment based on current theories, models, and approaches. The author synthesized the theoretical background regarding the utilization of the Metaverse within the foreign language learning process, providing its implications for practice and future research. From the theoretical points of view, Aydin concluded that Metaverse can be effectively used for foreign language learning, particularly due to its emphasis on social interactions that facilitate communication and interaction in language learning processes (Aydin 2022).

In EFL settings, there have been some experimental studies suggesting the positive effects of using Metaverse. Imaoka et al. (2012), for example, utilized Metaverse technology as a core curriculum in an EFL class for the first time in Japan. This curriculum integrated Metaverse, known as Second Life, into classroom learning. Second Life was used as a tool for students to interact and properly use and remember English expressions and phrases they

had learned. The aim was to help Japanese EFL students overcome their language barrier of timidity and fear of embarrassment when speaking in English with others. The authors found that the use of avatars in Metaverse helped students gain more confidence in English speaking and improve EFL learning.

Aydin (2023) investigated the attitudes and perceptions of Turkish EFL teachers towards using Metaverse in teaching and learning processes. Specifically, the study examined the teachers' perceived knowledge of Metaverse, their attitudes towards its utilization in EFL teaching and learning, their self-confidence in integrating it into their teaching pedagogy, and their perceptions of its use regarding school climate and support. The results showed that, although EFL teachers were not familiar with its utilization, they had positive attitudes towards using Metaverse in teaching and learning processes.

Im (2022) conducted a study in Korea on EFL students' perspectives and attitudes towards Metaverse in online English classes. The study found that the students generally had positive feelings towards the use of the Metaverse platform. As the students progressed through the classes, their positive feelings increased. Im identified several positive aspects of utilizing the virtual platform, including the ability to interact, opportunities for group activities, the existence of a virtual world, and the use of avatars. The results suggested that Metaverse has the potential to positively impact language learning by providing a virtual world for interaction and reducing learner anxiety and stress. In other words, Metaverse was found to play a crucial role in EFL learning.

Bae et al. (2022) also conducted a pilot study in the Korean EFL context with the purpose of developing an English speaking program using Metaverse. To determine the effects of the program, the authors monitored students' learning progress and administered pre- and post-tests with questionnaires and interviews. The results showed improvements in digital literacy and motivation regarding the English learning experience. Additionally, the interview results revealed that both the students and teachers were positive about the use of Metaverse in English classrooms, with the students showing a great interest in Metaverse-based English lessons. The teachers emphasized the importance of teacher training for successful future Metaverse-mediated language learning. The authors concluded that Metaverse-mediated language learning is effective without restrictions on time and space, leading to an authentic EFL speaking and learning experience. With appropriate task designs, Metaverse was found to help EFL learners develop oral communication skills and digital literacy (Bae et al. 2022).

Recently, a few EFL scholars have been studying the use of a particular Metaverse application called *ifland*. Hwang (2022) carried out a study to examine the efficacy and future potential of Metaverse in online education environment. Korean university students learning English as a foreign language used the *ifland* app in the Metaverse classes for the study. Through in-depth analysis, it was found that EFL students in a Metaverse environment are engaged in interactive learning processes with an avatar that projects oneself. *ifland*, the Metaverse platform, can be an effective educational tool that benefits from gamification and edutainment. Moreover, with existential encounters and hands-on experiences, Metaverse increases the level of 3D learning immersion, which may overcome the shortcomings of online live streaming platforms, including Zoom that provide 2D experiences.

Lee (2022) also designed a college English learning program using a Metaverse platform called, *ifland*, to offer diverse educational environments in a virtual space. With a content-based approach, the program emphasized digital culture and arts to enhance the students' learning experience. The students were given the opportunity to explore exhibitions and visit museums and art galleries using Virtual Reality (VR) and Augmented Reality (AR). They were also asked to conduct research on relevant cultural contents and materials for Metaverse-based presentations. This study found that students could gain a deeper understanding of digital culture and arts while improving their English skills. The students actively participated in the Metaverse-based class with diverse avatars, virtual theme spaces, images, and PDFs. It was concluded that the Metaverse-based English learning program

enables students to experience various forms of digital arts and immersive content, and fosters cultural convergence and critical thinking for future learning opportunities.

From the literature review, it has been found that there are many advantages of using Metaverse for EFL learning. Metaverse provides students with an authentic EFL speaking and learning experience without restrictions on time and space, helping them to develop their English oral communication skills (Bae et al. 2022). Moreover, by participating in various activities in virtual situations where they may encounter in real life, students can see the value of learning a language (Imaoka et al. 2012). The use of avatars in the virtual world can help students reduce the levels of anxiety, embarrassment, and stress, which in turn increases their self-confidence (Aydin 2023, Im 2022). Students show a great interest in Metaverse-based language learning, which can also improve their own academic achievement (Bae et al. 2022). For these reasons, both teachers and students in EFL situations have positive attitudes towards the virtual environment. In short, Metaverse can be an effective language learning tool, and EFL learners can benefit from Metaverse-mediated learning (Aydin 2023).

Despite all the benefits of using Metaverse, certain problems still exist regarding its utilization as a foreign language learning platform. Not only adult learners, but also underage ones from different parts of the world, can interact in the virtual environment, which may have negative effects on their development of communication skills, socialization skills, social awareness, and relationship building with others in the real world (Poht 2022). Furthermore, problems such as abuse and misuse, cyberbullying, addiction disorders, and health problems can occur, resulting in depression and anxiety for these learners (Aydin 2022). In addition, technical issues may constitute problems regarding the provision of infrastructure for hardware and software. There may be some financial and technical inequities around the globe. Particularly, there must be careful consideration for the cost of deployment of Metaverse technologies. As reported by Imaoka et al. (2012), the nature of these costly technologies might only be available to a certain group. In other words, accessibility issues should be taken into consideration. Im (2022) also identified technical difficulties as one of the challenges associated with using Metaverse in EFL learning.

There are some other threats related to the privacy and security of Metaverse users (Aydin 2022). Metaverse can collect massive amounts of information, including sensitive and critical information about its users. As reported by Di Pietro and Cresci (2021), this personal and private information can be delivered not only to the platform but also to other users, putting their privacy at risk in unexpected ways. For example, one of the new and increased risks is related to doxing, with the aim of extortion or online shaming. In addition to privacy issues, Metaverse can be affected by security threats (Di Pietro and Cresci 2021). These include vulnerability to attacks and manipulation, as well as a lack of transparency. The inherent complexity of Metaverse also requires the huge computational energy, limiting both its affordability and sustainability. These issues represent an open scientific challenge and require joint efforts from different scientific communities (e.g., AI and machine learning, ethics, and more) to be solved.

Scholars have also pointed out some challenges regarding the unfamiliarity with the Metaverse platform (Im 2022). Because EFL teachers are not familiar with its utilization, they have neutral perceptions of its use for their teaching processes (Aydin 2023). Therefore, concerns can arise in relation to the use of Metaverse as an effective EFL learning platform. As reported by Aydin (2022), it is still unclear whether the use of Metaverse is beneficial for EFL learning. Considering that the use of Metaverse in education is in its infancy, more experiments and research studies should be carried out (López-Belmonte et al. 2023). In particular, given that there is a lack of research on the use of Metaverse in light of EFL education (Bae et al. 2022), a deeper understanding of Metaverse for EFL learning is required. The rationale needs to be established for its successful implementation and practice (Aydin 2022).

3. Methodology

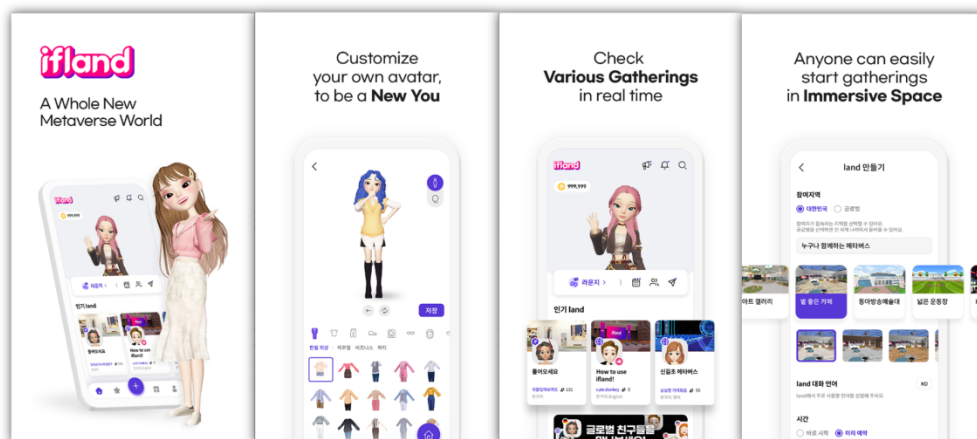
3.1 Participants

The participants of the study were university students who enrolled in Airline English classes at the beginning of the 2022 academic semester. Initially, there were 52 students who registered for the two classes. As the course was an elective, students' grades varied, ranging from freshmen to seniors. Among them 45 students participated in this study (freshmen: 8, sophomore: 11, junior: 13, senior: 13). They were randomly assigned to two groups: a traditional group and a Metaverse group. Students in the traditional group practiced conversation dialogs they had learned in class, while those in the Metaverse group used their avatars and practiced the same dialogs with one another in the virtual classroom, switching partners.

There were 21 students in the Metaverse group, and 24 students were grouped into the traditional group. All participants in the current study were majoring in airline services and selected their classes according to their own schedule. At the beginning of the semester, every participant took a pre-test based on the MacMillan Placement Test, which was administered in a previous study that determined Korean EFL students' English proficiency levels (Domínguez, Hicks, and Song 2012). The findings revealed no statistically significant differences in the pre-test (see Table 3). It was found that the two groups - a traditional group and a Metaverse group - were homogeneous.

3.2 Metaverse Platform: ifland

The study integrated Metaverse known as *ifland* into the curriculum for students majoring in airline services. *ifland* is an application released in September 2021 by SK Telecom in Korea (see Figure 1). When users activate the *ifland* app, they can check and update their status and avatars and view a list of virtual rooms recommended based on their usage patterns. They can also open the new rooms by tapping the "Open a Room" icon. There are 18 different types of virtual spaces to choose from, including conference halls, outdoor stages, rooftops, and more. After selecting the virtual space, users can also make advanced settings by choosing from multiple concepts for decoration, such as weather, time, wallpapers, and flooring materials. In addition to the virtual spaces, users can also customize their avatars by choosing from a wide range of clothing and accessories. They can express their creativity by designing their outfits, hairstyles, and accessories. The color of their skin and eyes can also be changed. In a virtual room, users can interact with each other through chat or by using body gestures and animations. They can also share media such as videos, images, and music in real-time. The virtual room can accommodate up to 130 participants. In *ifland*, avatar customization and app use are all free.

Figure 1. ifland sample¹

According to Lee (2022), this Metaverse platform, *ifland*, offers diverse educational environments in a virtual space. In her study, Korean EFL students actively participated in the Metaverse-based class using diverse avatars in virtual themed spaces. She found that they gained a deeper understanding of digital culture and arts while improving their English skills. Hwang (2022) also suggested that Korean students in *ifland* actively engage in the interactive learning process with avatars that project themselves. He found this virtual educational platform effective because it incorporates gamification and edutainment to provide benefits.

3.3 Teaching Procedures & Instruments

The present study investigated whether Metaverse can play a beneficial role in improving EFL learners' English proficiency. The study also aimed to reveal the students' perspectives regarding the use of Metaverse in an EFL class, including its positive and negative aspects. Throughout the experiment, the same instructor taught classes using either the traditional way or the Metaverse platform. Although the overall learning content remained consistent, different approaches were implemented during the speaking activities in each class.

At the beginning of 2022, every participant took a pre-test adopted from MacMillan Placement Test (see Table 1). The purpose of the test was to assess the English language proficiency of individuals in using English within an EFL context (Al-Sharif 2016, Domínguez et al. 2012, Newell and Katz 2013, Rusilowati and Hamamah 2017). The test questions, teacher instructions, and answer keys were available online, and could be downloaded as a PDF² for free. The test consisted of 70 questions and thirty minutes were allowed, as per test instructions. Participants were encouraged to attempt as many questions as possible within the allotted time.

¹ Source: Google Play (<https://play.google.com/store/apps/details?id=com.skt.treal.jumpvrm&hl=en&gl=US>)

² https://www.macmillan.pl/images/materials/1666952670_Language_Hub_Placement_Test_with_key.pdf

Table 1. Teaching Procedures

Topics	Procedure	Pre-test	
		Traditional Group	Metaverse Group
Basic Service Expressions			
Greeting Passengers			
Assisting with Seating			
Preparing for Takeoff		Dialog Practice in a Classroom	Dialog Practice in a Metaverse Platform
Providing In-flight Food and Beverage Service			
In-flight Announcement			
Handling Customer Complaints			
Preparing for Landing			
		Post-test	
		No survey	Survey

After the pre-test, the main experiment began. This Airline English class was held once a week for 100 minutes, using the textbook, *Airline Service English for Cabin Crew* (Kim 2018). The topics covered various aspects of airline services, including greeting passengers, assisting with seating, preparing for takeoff and landing, and providing in-flight food and beverage service. Each unit provides sample conversation dialogs between flight attendants and passengers. The students engaged in a self-study session on a designated topic for the first 20 minutes, during which they utilized online dictionaries on their smartphones to look up the meanings of any unfamiliar vocabulary words in the English conversation dialogs. During the session, they were also allowed to use online translation tools such as *Google Translate* and *Never Papago* if needed. The teacher then used *Power Point Slides* to teach and explain the dialogs, including vocabulary, grammar structures, phrases, and expressions to the students, which took about 60 minutes.

Afterwards, the students in the traditional group spent an additional 20 minutes practicing the conversation dialogs they had learned in class. They paired up to practice given dialogues and also moved around to have conversations with other students. The dialogs provided were examples that portrayed interactions between flight attendants and passengers, so the students took turns playing the role of flight attendants and passengers. While the students practiced the given dialogs, the teacher walked around the classroom helping the students in need. It is common for EFL students to join role-play activities to practice what they have learned in class (Imaoka et al. 2012). However, when students engage in role-play activities in classrooms, they need to imagine the setting they are acting out. As reported by Imaoka et al. (2012), this makes it difficult for the students to capture the real sensations of an actual situation and perceive the practical value of classroom lessons.

In the Metaverse setting, the students also spent 20 minutes practicing the same conversation dialogs from the same textbook they had learned in class. For this group, *ifland*, one of the platforms, was adopted to create a virtual environment. This Metaverse-integrated curriculum was aimed to meet two main objectives, 1) to enable learners to remember and use learned phrases and expressions better, and 2) to enhance their meaning and practicability. In the first class of the second week, various platforms of the Metaverse were introduced and the usage and features of the *ifland* app were explained to the students. Because the Metaverse platform was unfamiliar to the students, as previous scholars pointed out (Aydin 2023, Im 2022), all activities were conducted in a classroom setting. The students used their own smartphones to download the application and enter the virtual space.

The teacher chose a virtual space that resembled an airport lounge from the available virtual spaces provided by

the *ifland* application. The students created and customized their own avatars and entered the virtual space to practice the dialogs through chat. Just like their traditional counterparts, the students in the Metaverse group were provided with conversation dialogs exemplifying interactions between flight attendants and passengers, they participated in the same role-playing activities as the traditional students did. That is, the traditional method involved speaking activities, while on the metaverse platform, speaking and written interaction were integrated and performed concurrently.

However, they alternated between the roles of a flight attendant and a passenger using their avatars in the virtual space. This 20-minute virtual experience was expected to mimic the real world and encourage the students to use what they had studied in class. According to Imaoka et al (2012), in a virtual reality setting like Metaverse, students can easily make connection between the hypothetical and the actual by conversing and utilizing dialogues and expressions they have learned in class in the virtual world that copies its real-world counterpart. The teacher also walked around the class and helped the students.

Due to the COVID-19 pandemic, classroom activities did not take place every week. Furthermore, the first and final weeks, as well as the midterm exam period, were also excluded. In total, the activities for this study were carried out for 8 weeks. At the end of the semester, all the participants took a post-test adopted from MacMillan Placement Test, using the same format as the pre-test. Since the study also aimed to gain insights into the positive and negative aspects of using Metaverse in EFL class from the students' perspective, a post-survey was conducted among the students in the Metaverse group to assess their views on using Metaverse in an EFL class.

3.3 Data Analysis

For the current study, both test scores and survey results were gathered. The pre- and post-test data were analyzed using SPSS 20.0 to compare the students' English scores between the traditional learning environment and the Metaverse platform. Paired sample *t*-tests were conducted to examine the differences in mean scores between the pre- and the post-stages. Additionally, an independent *t*-test was performed to determine which learning environment was more effective in the two different learning environments. Regarding the students' perspectives on using Metaverse, twenty students, excluding one out of 21 participants in the Metaverse group, responded to the survey.

They were given a *Google Form* link to answer the survey. The survey consisted of 18 closed-ended questions related to the EFL students' dialog practice experience in the Metaverse platform. The items in the questionnaire consisted of 11 questions related to learners' attitudes toward using Metaverse, 6 questions related to language technology, and 1 question related to future usability. A six-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = somewhat agree, 5 = agree, 6 = strongly agree) was used for the survey. The survey analysis focused on percentage comparisons instead of means to gain a more detailed understanding of students' responses, given the low average score for each item. In addition, there were also two open-ended items that addressed the advantages and disadvantages of using Metaverse. The results of students' responses were analyzed and categorized into key concepts, and their frequency and percentages were computed.

4. Results and Discussions

4.1 Changes in Students' English Proficiency

The present study aims to investigate the effects of English proficiency among students using different learning platforms. The first research question is to compare the mean scores on the pre- and post-tests in each group: a traditional group versus a Metaverse group. Students in the traditional group practiced speaking in the classroom, whereas those in the Metaverse group practiced speaking in the Metaverse environment. Paired sample *t*-tests were conducted to examine the English proficiency between the pre- and post-test scores within the two groups.

Table 2. Result of Paired Sample *t*-tests

Group	Test	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
Traditional (<i>N</i> = 24)	pre	23.63	6.29	-4.41	.00
	post	32.33	9.29		
Metaverse (<i>N</i> = 21)	pre	22.76	5.79	-4.83	.00
	post	31.67	9.25		

Table 2 shows the results of the pre- and post-tests. The findings demonstrate a comparison of the mean scores between the two groups' pre- and post-tests. Regarding the traditional group, the mean score in the pre-test was 23.63 (*SD* = 6.29) and 32.33 (*SD* = 9.29) in the post-test. As for the Metaverse group, the mean score of the pre-test was 22.76 (*SD* = 5.79) and that of the post-test was 31.67 (*SD* = 9.25). The results indicate that there was a significant difference in the mean scores before and after the semester for the traditional group ($t = -4.41, p = .00$). Similarly, the results of the paired samples *t*-test present a significant difference between the mean scores on the pre- and post-tests for the Metaverse group ($t = -4.83, p = .00$).

The results of the study confirm that practicing speaking with others can lead to better language performance, which is in line with previous research (Imaoka et al. 2012). As Imaoka et al. (2012) stated that students in the traditional group participated in role-play activities to apply what they learned in class, practiced dialogues, and talked to other students. In the Metaverse group, by engaging in activities in simulated environments that mirror real-life situations, students can gain the benefit of learning a language. In other words, whether in traditional or virtual modes, students can improve their language proficiency. Additionally, based on the results, both groups showed improvement in their speaking performance, which was found to be beneficial.

To confirm that the participants in the traditional and Metaverse groups were homogeneous at the beginning of the semester, independent *t*-tests were conducted on the pre-tests. As shown in Table 3, the results confirmed that the participants were homogeneous for the test mean scores ($t = -.477, p = .636$). The mean scores of the post-tests for the two groups did not differ statistically significant according to the independent *t*-test results ($t = -.241, p = .811$).

Table 3. Group Differences: Result of Independent *T*-tests

Test	Group	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
pre	Traditional	23.63	6.29	-.477	.636
	Metaverse	22.76	5.79		
post	Traditional	32.33	9.29	-.241	.811
	Metaverse	31.67	9.25		

While there was a substantial difference after the experiments in all the groups, no significant difference was discovered between the groups. It is reasonable to believe that different types of learning environments do not significantly impact the improvement of language proficiency. The findings of the present study confirm the previous study (Poth 2022) that despite the advantages of using Metaverse, there are some issues with using it as a platform for foreign language learning. Students' ability to communicate, socialize, be aware of their learning environment and form relationships with others in the actual world may suffer as a result of their participation in the virtual world.

4.2 Students' Perspectives on Using a Metaverse Platform

As for the second research question, a survey was used to explore participants' perspectives using the Metaverse platform. Students' opinions on speaking practice on a Metaverse platform were investigated using the post-survey. The open-ended survey consisted of 18 questions: 11 questions related to learners' attitudes after using the Metaverse (such as helping to improve your skills, relieving anxiety, reducing stress, learning motivation, improving confidence, generating interest, being self-directed, acquiring learning strategies, helping to achieve learning goals, promoting class participation, and improving communication skills), 6 questions related to language skills (such as improving vocabulary, grammar, listening, speaking, reading, and writing), and 1 question related to the use of the platform for future learning.

The frequencies and percentages of the responses from the Metaverse group are shown in Table 4. Regarding the first survey item, '*improvement of English skill*,' 35% of the students disagreed or somewhat disagreed, 20% strongly disagreed and 10% somewhat agreed. Most students did not demonstrate a positive attitude towards improving their English learning. In terms of '*relieving anxiety*,' 25% of the students disagreed, 55% somewhat disagreed, and 20% somewhat agreed that their anxiety had reduced. Concerning the '*stress reduction*' item, many students (60%) responded with somewhat disagree, five with somewhat agree, and three with disagree. Most of the students responded negatively to the '*motivation for learning*' item (45% disagreed, 40% somewhat disagreed and 15% strongly disagreed). In the item, whether '*confidence*' had improved after using the Metaverse, students showed negative tendencies with responses similar to those for '*learning motivation*' (60% disagreed, 25% strongly disagreed, and 15% somewhat disagreed). Some students showed '*interest*' after using Metaverse at the same rate (45% somewhat disagreed and 45% somewhat agreed, respectively). Regarding '*self-directed learning*,' most of the students responded somewhat disagree (50%) or disagree (30%). Regarding the utilization of '*learning strategies*' with Metaverse, most of them responded negatively (15% strongly disagreed, 55% disagreed, and 30% somewhat disagreed). When using Metaverse, students showed disagreement or somewhat disagreement regarding whether they '*achieve their learning goals*'. Similarly to the previous survey question, it showed a somewhat

negative answer regarding 'class participation' (35% disagreed and 40% somewhat disagreed). Contrary to expectations, students did not show a positive answer regarding the 'communication skill' (40% disagreed, somewhat 40% disagreed, and 15% somewhat agreed).

Table 4. Survey Results: Students' Perspectives

Items	1	2	3	4	5	6
Improvement of English skill	4 (20%)	7 (35%)	7 (35%)	2 (10%)	0 (0%)	0 (0%)
Relieving Anxiety	0 (0%)	5 (25%)	11 (55%)	4 (20%)	0 (0%)	0 (0%)
Stress reduction	0 (0%)	3 (15%)	12 (60%)	5 (25%)	0 (0%)	0 (0%)
Learning motivation	3 (15%)	9 (45%)	3 (40%)	0 (0%)	0 (0%)	0 (0%)
Confidence	5 (25%)	12 (60%)	3 (15%)	0 (0%)	0 (0%)	0 (0%)
Interest	0 (0%)	2 (10%)	9 (45%)	9 (45%)	0 (0%)	0 (0%)
Self-directed Learning	1 (5%)	6 (30%)	10 (50%)	3 (15%)	0 (0%)	0 (0%)
Learning strategy	3 (15%)	11 (55%)	6 (30%)	0 (0%)	0 (0%)	0 (0%)
Helping you achieve your learning goals	1 (5%)	11 (55%)	8 (40%)	0 (0%)	0 (0%)	0 (0%)
Active class participation	3 (15%)	7 (35%)	8 (40%)	2 (10%)	0 (0%)	0 (0%)
Communication skills	1 (5%)	8 (40%)	8 (40%)	3 (15%)	0 (0%)	0 (0%)

1 strong disagree 2 disagree 3 somewhat disagree 4 somewhat agree 5 agree 6 strong agree

The results for anxiety, motivation for learning, confidence, self-directed learning, utilization of learning strategies, and achievement of learning goals also showed negative tendencies, with a majority of the students responding with disagree or somewhat disagree. The responses for class participation and communication skills were also negative, with a majority of the students disagree or somewhat disagree.

This finding is not consistent with previous studies (Aydin 2022, Bae et al. 2022) that the virtual world of Metaverse can be beneficial for EFL learners, as it allows them to use avatars to reduce anxiety and embarrassment leading to increased interests and self-confidence. Unexpectedly, the participants did not show positive perspectives towards using Metaverse. The results proved that virtual learning environments could have potential negative effects on students' development of communication, socialization, social awareness, and relationship building skills (Poth 2022).

Table 5. Survey Results: Language Skills

Items	1	2	3	4	5	6
Vocabulary	1 (5%)	7 (35%)	10 (50%)	2 (10%)	0 (0%)	0 (0%)
Grammar	10 (50%)	6 (30%)	4 (20%)	0 (0%)	0 (0%)	0 (0%)
Listening	2 (10%)	10 (50%)	7 (35%)	1 (5%)	0 (0%)	0 (0%)
Reading	1 (5%)	7 (35%)	7 (35%)	5 (25%)	0 (0%)	0 (0%)
Speaking	3 (15%)	1 (5%)	12 (60%)	4 (20%)	0 (0%)	0 (0%)
Writing	2 (10%)	6 (30%)	7 (35%)	5 (25%)	0 (0%)	0 (0%)
Future use	2 (10%)	5 (25%)	6 (30%)	7 (35%)	0 (0%)	0 (0%)

1 strong disagree 2 disagree 3 somewhat disagree 4 somewhat agree 5 agree 6 strong agree

Regarding language areas, as shown in Table 5, students had a similar tendency toward disfavoring Metaverse. Most students showed a negative perspectives on grammar and they showed similar tendencies in vocabulary and listening. In contrast to other language areas, Reading (25%) and writing (25%) showed the most positive response, with students giving favorable answers. It can be assumed that the remaining students received some assistance despite 80% of students responding that they were unhelpful to improve their speaking skill.

There were various responses regarding whether students would use Metaverse in the future. 35 % of students stated that they might use it, while 65% said they would not. In other words, one-third of students showed interest in using the Metaverse in the future, but majority of the students had a negative response to using Metaverse for language learning in future.

In summary, the survey responses show that the majority of the students did not have a positive perspective on using the Metaverse for their English learning. Concerning the first survey item, '*improvement of English skills*,' 90% of the students had negative opinions while only 10% somewhat agreed on the enhancement of English learning. This indicates that a significant portion of the students did not see any improvement in their English skills after using the Metaverse.

The results of the survey were not supportive of the idea that learning can be made more successful as a language learning tool in a virtual world with Metaverse. (Aydin 2022, Bae et al. 2022). As Aydin (2022) argued that the use of Metaverse technologies can cause technical and accessibility issues, and learners may feel uncomfortable when using the platform. These issues can cause low motivation, lack of interest, and anxiety for learners. Careful consideration must be given to the cost of deploying Metaverse technologies, as they may only be available to certain groups. As reported by Imaoka et al. (2012), accessibility and other issues should be taken into consideration.

To gain a better understanding of the participants' views on Metaverse, two open-ended questions were posed at the end of the survey to explore the pros and cons of using it. The results are presented in Tables 6 and 7, with a total of twenty responses for both the benefits and drawbacks, respectively.

Table 6. Survey Results: Advantages of Using the Metaverse Platform

No	Responses	#	
1	English usage - To practice English in a real-life setting - To experience the role of a flight attendant - To practice writing English in a practical setting, as there were limited opportunities to use English elsewhere - To speak English while assuming different roles	6	30%
2	No responses	4	20%
3	Benefits of online communication - Useful for online classes - Anonymity in communication	3	15%
4	Playing games - Interesting because speaking English felt like a game	3	15%
5	Miscellaneous - A unique experience - Fun creating my own Avatar - Allowed me to forget about the class time	3	15%
6	Nothing	1	5%
	Total	20	100%

Regarding the advantages of using the Metaverse platform, six students (30%) commented about learning English based on a Metaverse platform. They stated that *"It was a great opportunity to practice English in a real-life setting, such as role playing as a flight attendant. Additionally, it was an interesting way to use English since I don't get many chances to do so in real life."* Four students (20%) did not mention any advantages while three students (15%) noted the benefits of online communication, stating that *"the Metaverse platform was accommodating for online classes and convenient as they didn't have to know anyone in person; that is anonymity was helpful in a way."* Another three students (15%) mentioned that speaking English on the platform was like playing games and very interesting. In addition, there were different opinions such as that *"it was a unique experience and creating my own Avatar was fun, almost forgetting that I was in an English class."*

Based on the findings, it is evident that using English in the Metaverse platform had a positive impact on students' learning, as demonstrated in Table 6. It provides learners with a great opportunity to play different roles in a real-life setting, offering immersive and engaging language learning experiences. Also, anonymity may help reduce feelings of self-consciousness, creating a more relaxed atmosphere for learners to practice English. Additionally, students found the Metaverse platform to be more enjoyable and motivating for learning English. These benefits are supported by Imaoka et al. (2012) that students may feel less anxious when interacting with other students in a virtual atmosphere and even enhance their confidence in language learning. Hwang (2022) also confirmed that using the Metaverse platform can be both motivating and entertaining. However, it is worth noting that some students did not benefit from this method of learning, indicating that not all students will like it. As such, it is important to consider students' preferences for learning English when incorporating the latest technology.

The disadvantages of using the Metaverse are presented in Table 7. Six students (30%) reported that learning English on this platform was not as convenient as they had anticipated. Their opinions were, *"I had a difficult time following others' speech bubbles when multiple students were chatting at the same time. I don't think using English in the Metaverse is helping me improve my English. Some students spend too much time decorating their Avatars instead of focusing on class activities. Speaking English in the Metaverse environment is too inconvenient."* Five students (25%) commented that using English in the Metaverse environment was not interesting at all. They claimed that *"they were annoyed because their Avatars were mixed up, making it difficult to identify their own. Also, the limited variety of Avatars was also frustrating. Using English through mobile phones was challenging because of the automatic typing function, resulting in accidental sending of unintended messages."* Three students (15%) mentioned system issues such as *"I had to be connected to Wifi, or I would get disconnected from the system. Sometimes the speech bubbles were overlapping and hard to see clearly."* Two students (10%) stated difficulty in understanding the purpose of learning through Metaverse. Another two students (10%) did not respond. The final two students (10%) commented that *"it felt too much like playing a game instead of learning English, making it difficult to concentrate on learning the language."*

Table 7. Survey Results: Disadvantages of Using the Metaverse Platform

No	Responses	#	
1	Learning English - Difficult to follow others' chatting if several students were chatting at the same time - I don't see how using the Metaverse would help me improve my English, and I spent too much time decorating Avatars. - I'd prefer to listen to a professor's lecture as typing in English too much time (chatting), and also I'd rather memorize English expressions on my own during that time. - Not suitable for offline classes - Speaking practice is not possible. - Speaking English in the virtual environment is inconvenient.	6	30%
2	Not interesting - Annoyed because Avatars were mixed up - Using English through mobile phones was annoying due to the 'automatic typing function,' which could lead to sending unintended messages. - Avatars were too similar with limited variation.	5	25%
3	System Issues (such as access problems) - Complicated - Needed to connect to Wifi, otherwise I would be disconnected from the system - Not see the speech bubbles clearly because they overlapped with others' speech bubbles	3	15%
4	No ideas - Had no idea if I was learning anything since I was typing (chatting) instead of speaking - Concept was new, but I don't see how it could help me improve my English	2	10%
5	No responses	2	10%
6	Miscellaneous - Too much like a game, not enough focus on learning English - Difficulty in maintaining concentration while speaking English	2	10%
	Total	20	100%

The survey's findings confirmed those of the other studies (Aydin 2023, Hwang 2022, Lee 2022) that the Metaverse can be an effective educational tool due to its benefits of gamification and edutainment, and students can also gain a deeper understanding of digital culture and arts. Learning English through the Metaverse platform offers a unique experience and have potential benefits for foreign language learning. However, it presents challenges that need to be addressed, and accessibility issues must also be taken into consideration due to the cost of deployment.

5. Conclusion

This study aimed to investigate the effects of using Metaverse on EFL students' academic achievement and to gain insights into students' perspectives on the use of Metaverse in EFL classes. It examined students' opinions of utilizing the Metaverse learning platform and compared the academic results of students who learned English in a traditional environment and those who used English in the Metaverse platform. The traditional group practiced dialogs they had learned in class, while the Metaverse group used their avatars to practice the same dialogs with one another in the virtual environment, changing their partners. The findings of the study are summarized based on the two research questions.

Regarding the first research question, the results revealed that the means of the two groups-one practicing speaking in the classroom and the other practicing speaking in a virtual environment-were computed to determine the students' language proficiency. A paired samples *t*-test showed that there was a significant difference in the

mean scores before and after the semester for both the traditional and Metaverse groups. Before the experiment, the result of an independent *t*-test was confirmed that the participants in the traditional and Metaverse groups were homogeneous. The results of the post-tests after the lessons revealed no statistically significant difference between the traditional and Metaverse group. It is unclear whether the Metaverse plays a role in improving students' language proficiency. In other words, despite the fact that the students interacted with others via the Metaverse platform, it did not appear to be helpful. It can be assumed that the learning outcome has no impact on the Metaverse platform or conventional methods.

Concerning the second research question, the findings revealed that most students had a negative attitude towards the Metaverse learning platform, which was contrary to the assumption that they would generally have positive attitudes towards it. Students responded negatively to questions about their confidence, learning motivation, self-directed learning, and utilization of learning strategies after using the Metaverse. The survey's findings also showed that students' opinions on communication skills and class involvement were slightly unfavorable. Moreover, the findings indicated that grammar, listening and vocabulary had an unfavorable response to the Metaverse, while reading, writing and speaking had a more neutral attitude from the majority of students. Additionally, about one third of the students stated they might use the Metaverse in the future, while two-thirds of them indicated that they would not. The survey results suggest that the Metaverse may not have effectively addressed the needs and expectations of the students in terms of English language learning. Further investigation may be needed to determine the reasons for these negative perceptions and to identify ways to improve the use of the Metaverse for language learning.

Regarding the benefits and drawbacks of utilizing Metaverse, various opinions and ideas were presented. Participants mentioned the benefits of using English in a real-life setting, such as practicing English in the role of a flight attendant, and how it can be used to practice writing English in a practical setting. They also mentioned the benefits of online communication, such as being useful for online classes and being anonymous. Playing games was also discussed, as it made speaking English more enjoyable. Finally, it was a unique experience and fun creating an avatar, and allowed them to focus on class activities. On the other hand, the students had a negative experience with learning English using Metaverse. They found it difficult to chat in English, and felt that it was not suitable for offline classes. They also found the avatars too similar and limited in variation, and had difficulty connecting to the platform. They were unsure if they were learning anything, and felt it was too much like a game and not enough focus on learning English. Therefore, it is important to consider how teachers can support students when using an online learning platform like Metaverse.

This study has several limitations. First, this study confirmed that the Metaverse platform can be an alternative learning tool to improve language proficiency. However, the scope of this research was limited to one educational level. That is, the outcomes may not be generalizable to all Korean university students since it was conducted on a small sample size. Since the MacMillan Placement Test is administered in a written format, the outcomes may differ when compared to the results of a speaking test. Additionally, the study was limited to speaking; consequently, further exploration is needed to comprehend the impact of the platform on other language skills, such as reading, writing, grammar and vocabulary.

Nevertheless, this study holds important educational implications. First of all, in a time when there were few studies on the use of Metaverse, comparing the effectiveness of English learning through Metaverse and traditional methods provides insights into learning English in a virtual atmosphere. In addition, it is also feasible to give ideas for the field of education by examining students' perspectives towards this new approach. While the benefits of using Metaverse should be implemented for the better use in the future studies, the drawbacks commented by students should be reconsidered when incorporating the Metaverse in the language classroom. In addition, this

study currently focused on university students, but applying it to a wider range of ages, could have greater educational implications. Finally, examining the learning effect in relation to the learner's digital preference or level of digital literacy could make the study more engaging.

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Examples in: English

Applicable Languages: English

Applicable Level: Tertiary