Perception and Attitudes towards Augmented Reality (AR) Enhanced Academic Writing: Satisfaction Levels

Marine Milad[1], Fatema Fayez[2]

[1] Associate Professor, Arab Open University, Kuwait

[2] Lecturer, Arab Open University, Kuwait

Correspondence: Marine Milad, Associate Professor, Arab Open University, Kuwait.

Received: December 27, 2024 Accepted: April 24, 2025 Online Published: June 5, 2025

doi:10.5430/wjel.v15n6p268 URL: https://doi.org/10.5430/wjel.v15n6p268

Abstract

The concepts of Virtual Reality (VR) and Augmented Reality (AR) have emerged since the middle of the twentieth century. Recently, many forms of Artificial Intelligence (AI), such as virtual reality and augmented reality have become imminent in nearly all walks of life. AI has become a modern helpful tool for educators and learners of English language education. This research paper aims to investigate Arab Open University (AOU) students' satisfaction level of using the Augmented Reality Platform (EON-XR) in learning and developing their academic writing skills as a self-learning tool. The study explores the impact of using Augmented Reality (AR) on students' perception and attitude towards enhancing some academic writing skills. The researchers have raised some fundamental questions addressing key aspects, such as the definition of AR, the difference between AR and VR, the specific characteristics of EON XR AR platform, and the extent to which this AR platform enhances academic writing skills among AOU students. The data have been collected from a literature review spotting the need for using VR and AR applications in English Language learning especially in developing academic writing. The instrumental tools used for this study are a satisfaction questionnaire which has been adapted and developed by the researchers via reviewing relevant studies in addition to seven realistic simulations with interactive 3D models as virtual environments designed by the main researcher. The data collected from these instrumental tools have been statistically analyzed and discussed. The finding revealed that AOU students generally responded positively towards the integration of the AR platform into their learning experience to develop their academic writing skills provided that the nature of the platform is user friendly.

Keywords: Virtual Reality (VR), Augmented Reality (AR), Artificial Intelligence (AI), Academic Writing Skills

1. Introduction

Virtual Reality (VR) technology has been in use since the 1960s, it has been evolving to gradually mimic the real world. Freina and Ott (2015) have identified two main types of VR, namely non-immersive and immersive. Non-immersive VR involves computer-based environments that simulate real or imagined locations, while immersive VR goes further by creating the sensation of being physically present in a virtual environment. Non-immersive VR can be experienced using a standard computer, but immersive VR requires specialized devices, which are becoming more user-friendly and affordable. In the past, bulky equipment like helmets with goggles was considered a significant challenge for usability, but recent advancements have improved the design and accessibility of these devices (Billinghurst, Clark, & Lee, 2015). Consequently, VR rests on three core principles: immersion, interaction, and engagement with the environment and the narrative (Freina & Ott, 2015). Such principles can improve educational settings by making learning experiences more motivating and engaging. Recently, the use of immersive VR in educational games has been limited due to high costs and usability issues. However, new tools like the commercially available Oculus Rift and Oculus Quest 2 are making immersive VR more accessible for various educational applications.

The integration of immersive technologies such as Virtual Reality (VR) and Augmented Reality (AR) has significantly transformed educational practices, offering innovative approaches to engage learners and enhance skill acquisition. While both VR and AR are immersive technologies that share the goal of enhancing user experience through interactive digital content, they differ fundamentally in their approaches. VR creates a fully simulated environment, immersing users in a virtual world that is detached from reality. In contrast, AR overlays digital elements onto the real world, blending virtual content with the physical environment to augment the user's perception (Gabbard, Mehra, & Swan, 2018). The distinction lies in the degree of immersion and the way each technology integrates digital content into the user's experience. The elements that characterize VR typically involve headsets, motion tracking, and hand-held controllers to navigate and interact with the simulated environment (Freina & Ott, 2015). These tools enable a sense of presence in virtual spaces, which is beneficial for tasks that require immersive simulations, such as virtual labs or fieldwork. On the other hand, AR is facilitated through devices such as smartphones, tablets, and smart glasses, which use cameras to capture the physical surroundings and project digital information onto them (Billinghurst, Clark, & Lee, 2015). This setup allows for more seamless interaction with both the real and digital worlds, enhancing learning opportunities by providing contextual information without disconnecting from the physical environment.

In the domain of education, AR and VR offer substantial benefits, particularly in terms of enhancing learning experiences and outcomes. Research has shown that immersive technologies can increase student engagement, motivation, and comprehension by presenting content in a more interactive and visually stimulating format (Radianti, Majchrzak, Fromm, & Wohlgenannt, 2020). For example, it has been proven that AR has significant potential specifically in STEM education through its spatial ability, practical skills, conceptual understanding, and scientific inquiry learning (Ibanez & Delgado-Kloos, 2018). Similarly, VR can have great potential in developing academic writing skills. It provides students with the ability to interact with writing prompts, grammatical rules, and structural guidelines in a dynamic manner, which fosters a deeper understanding and more active learning process (Zhai, 2023). AR-based educational applications can deliver real-time feedback, offer supplementary resources, and help visualize abstract writing concepts, which can improve students' proficiency in writing and their overall learning experience.

Understanding the effectiveness of AR tools in enhancing academic writing skills requires measuring student satisfaction with these technologies. Satisfaction levels can serve as an indicator of the perceived value of AR in educational settings and its potential of long-term adoption. This study aims to explore Arab Open University (AOU) students' satisfaction level with using AR tools (EON XR) to write academically, assessing its impact on their learning experiences, motivation, and skill development. By examining these aspects, the study seeks to contribute to the broader discourse on the role of AR in education especially English Language Learning (ELL) and its potential to support the development of essential academic skills.

2. Review of Literature

2.1 Definitions of VR and AR

Artificial intelligence (AI) refers to the capacity of digital computers or computer-operated robots to execute actions typically associated with intelligent beings. The term is widely used to create AI systems that exhibit human-like cognitive abilities, such as reasoning, meaning-making, generalization, and learning from experience (Anantrasirichai & Bull, 2022). Since the development of the digital computer in the 1940s, it has been demonstrated that computers can be programmed to perform highly complex tasks, such as proving mathematical hypotheses or playing chess, with remarkable proficiency (Khabib, 2022).

According to Yang (2007) the term “Artificial Intelligence” was first introduced by John McCarthy during a Dartmouth College workshop in 1956. AI research began after World War II, with engineers from all fields, not only computer sciences but also anthropology, biology, philosophy, psychology and linguistics, striving to create machines that could think like humans. Samakul, Abdul Hameid and Sukyadi (2022) claim that intelligence refers to human intelligence; therefore, they are models of human thinking and action. They state that AI are machines that can think and act humanly and rationally. Nowadays, AI has developed to the extent that it can be the driver of your car, the physician that performs an operation on you, the navigator that shows you directions, and the advisor that gives you legal advice. Thus, AI can also be a teacher in language learning classes and could promote personalized learning.

2.2 Difference between VR & AR

Virtual reality (VR) has indeed come a long way since its early days. It is “human immersion in a synthetic world” (Elmqaddem, 2019). Raja and Priya (2021) define VR as the simulation of 3D world that provides interaction with human beings with a sense of special presence. This technology has significantly evolved from the 90s, with modern VR headsets offering immersive experiences through advanced visual, auditory, and even tactile feedback (Elmqaddem, 2019). Since 2014, VR has become more accessible to the public due to the invention of more efficient and affordable headsets. The Oculus Rift, which had its developed version released in 2013 and hit the mainstream market in 2016, played a significant role in this shift. Google also contributed with its Google Cardboard, a low-cost VR solution using smartphones. Other notable VR headsets include Samsung’s Gear VR, HTC Vive, and Sony’s PlayStation VR. These high-end headsets provide more immersive experiences but require powerful computers or game consoles. Interestingly, there are still ongoing projects to develop less expensive VR headsets that work with less powerful computers (Elmqaddem, 2019; Fereina & Ott, 2015).

Likewise, Augmented Reality (AR) is a technology that overlays computer-generated virtual imagery onto a live real-world environment in real-time by bridging the gap between the real and virtual. AR differs from Virtual Reality (VR) in the sense that the entire environment is computer-generated. AR systems can be either marker-based, using physical markers to overlay digital content, or marker-less, using technologies like GPS and image recognition to integrate virtual elements without special labeling. While early AR systems were limited by computing power, the technology has since been widely adopted by major companies for visualization, training, and other applications (Lee, 2012).

2.3 Benefits of AI

Many researchers have pointed out several benefits of Artificial Intelligence (AI), including efficiency and automation. AI excels at automating repetitive tasks, significantly reducing human error and freeing up time for more complex activities. This leads to increased productivity and cost savings for varied domains as well as enhanced decision-making (Garzon 2011; Kasim and Ozarslan, 2012). By analyzing vast amounts of data quickly, AI provides valuable insights and predictions, aiding in more informed and timely decision-making processes. Moreover, AI fosters innovation by enabling the development of new technologies and improving safety in critical areas like healthcare, where it can assist in diagnostics and personalized treatment plans. AI technologies enhance accessibility for individuals with disabilities, offering tools like speech recognition and automated transcription services that make digital content more inclusive. AI has also played a significant role ethically in the field of medicine and neurosurgery. It helps in solving the problem of performing surgeries by

non-experts (Fereina & Ott , 2015).

2.4 Challenges/ Drawbacks of AI

Garzon (2011) has also pointed out some of the drawbacks of Artificial Intelligence (AI). Job displacement can be a direct impact of adopting AI in the workplace. The automation of tasks by AI can lead to job losses, particularly in industries reliant on routine manual labor. This displacement can have significant economic and social impacts. Another drawback can be the high costs of implementing AI systems, which require substantial investment in technology and skilled personnel. This can be a barrier for smaller organizations. In addition, ethical concerns have been raised, including data privacy, algorithmic bias, and potential misuse in surveillance and decision-making (Cook, et al., 2019). Most importantly, AI cannot think creatively or understand emotions, which are essential in fields requiring human empathy and innovative problem-solving (Milad & Fayez, 2024). Research conducted by AI is not appreciated by the research community, and any work produced via it is considered unproven work; therefore, there are some major concerns about integrating it into classrooms.

Jamrus and Razali (2019) have found that even though AR provides a very interactive, immersive teaching tool, it can distract students' attention away from the intended educational purpose presented in such a tool. They have noticed as well that it could lead to frustration when students find it hard to deal with AR applications. They have also mentioned that augmented reality devices can be considered as intrusive technology. The devices used in technology can disturb the natural interaction between students and their teachers.

2.5 AR in Education

Sumakul, Abdul Hamied, and Sukyadi (2021) state that AI was introduced to the classrooms in the 1980s, and ever since it has been able to provide students with a more meaningful interactive environment where students are provided with interactive and effective feedback on grammar, which increases student motivation and reading comprehension. For instance, VR provides a complete Immersion by creating a fully immersive digital environment that replaces the real world (Elmqaddem, 2019). Users wear VR headsets that block out their physical surroundings, transporting them to a completely virtual space. Therefore, it is widely used in gaming, training simulations, and virtual meetings or events. It provides a completely immersive experience, isolating users from the real world and placing them in a virtual environment.

According to Tian, Zulkifli, and Ayoub (2023), VR technology is increasingly being applied in art education, highlighting the need to weigh the advantages and disadvantages of VR concerning traditional educational methods. Continuous enhancement and innovation are essential, considering the subject matter, professional demands, learning environments, and unique features of the curriculum. This alignment ensures that VR technology effectively complements the curriculum and truly enriches students' learning experiences. Additionally, they have found that the integration of technology in the classroom has been met with favorable responses from students, enhancing their interest and motivation to engage with the material. Nevertheless, it is vital to acknowledge the significance of tailoring VR technology to suit the specific needs of the curriculum and the learners. Avoiding a rigid approach is crucial; instead, the immersive, interactive, and contextual elements of VR should be skillfully integrated into particular courses to maximize their effectiveness.

Similarly, AR has positively influenced various fields such as industry, entertainment, medicine, and tourism. In education, AR has been used for over 25 years, starting with applications like teaching three-dimensional anatomy (Garzon, 2021). AR tools have evolved to provide interactive learning experiences across different educational levels and fields. The development of AR applications has progressed through different phases, with early applications relying on head-mounted displays and heads-up displays. The emergence of game engines, Software Development Kits (SDKs), and libraries has made it easier to develop AR content, leading to more accessible and affordable applications.

The integration of AR in education and training has seen significant advancements in recent years, with researchers and professionals developing practical theories and applications for its adoption in academic and corporate settings. It focuses on vocational training for adult workers where certain locations are not accessible because of the dangers, like the US army soldiers when training (Fereina and Ott, 2015). While some innovative AR solutions have been implemented to enhance the learning and training efficiency of students and employees, there are still ongoing studies to improve the compatibility and applicability of AR in real-world scenarios. However, questions remain about the cost-effectiveness and efficiency of AR instructional systems compared to conventional methods (Lee, 2012).

Consistent with Nor Mahadzir and Phung (2013), the use of AR in formal education could be a key component in future learning environments rich with a blend of hardware and software applications. Similarly, the development of AR pop-up books for English language learning allows digital content to be overlaid and mixed into the students' perception of the real world. Moreover, AR technologies can be used for educational purposes in several ways: they help learners engage in authentic exploration of the real world with virtual objects as supplementary elements, extend the integration of real-world and digital learning resources, and enable learners to manipulate virtual materials from various perspectives to understand scientific phenomena and spatial relationships (Wu, Lee, Chang, & Liang, 2012).

2.6 AR in Language Classrooms

Recently, some studies have been conducted to investigate the effect of using AI applications in language classrooms. In the study conducted by Marzuki, Wadiati, Rudsin, and Indrawati (2023), they found that using AI tools, such as Quillbot, Jenni, Chat-GPT, WordTune, Copy.ai, Paperpal, and Essay Writer, in the EFL classroom has enriched the learning environment and has enhanced students' academic writing skills in sentence structure, paraphrasing, proofreading, and clarity. They have also found that these AI tools have a positive role in enhancing the students' logical progression and overall performance. They reported that the teachers in their study were supportive of using AI tools

(QuillBot and Wordtune) in the classroom since they help in paraphrasing and proofreading, enhancing critical thinking (Marzuki, Wadiati, Rudsin, & Indrawati, 2023).

AR, as explained by Kipper and Rampolla (2012), differs from VR by overlaying digital information onto the real world, enhancing rather than replacing reality. Various hardware technologies, such as head-mounted displays and mobile handheld devices, support AR applications. Given the widespread use of smartphones, these devices are particularly suitable for AR applications. Studies have shown that AR can facilitate English language learning, especially in vocabulary acquisition. For instance, Jamrus and Razali (2019) have found that AR materials designed for beginner-level students improved their motivation and academic achievement in vocabulary learning. They have stated that using AR can facilitate teaching reading, AR materials were designed to make vocabulary learning more effective and appealing by incorporating animation and sounds for students at the primary level. The results showed that the students were more interested and motivated to learn the target vocabulary, which has positively reflected their academic achievement.

However, they have identified several limitations of integrating AR into English language learning. First, students may face difficulties maintaining superimposed information, leading to frustration when AR applications malfunction or are cumbersome to use. Second, AR can be distracting, with students focusing more on virtual elements than actual educational content, especially since AR is novel to them. Third, AR can be intrusive, disrupting natural interactions between students and teachers, particularly when using head-mounted displays. Above all, effective AR implementation requires well-equipped classrooms and stable internet connections (Jamrus and Razali, 2019).

Therefore, many educators and researchers have tried to develop accessible and flexible educational models. For example, Lui (2009) has developed the Handheld English Language Learning Organization (HELLO) using Augmented Reality (AR) to facilitate listening and speaking among 7th graders. This outdoor activity allowed students to interact with a Virtual Learning Tutor (VLT) in various school zones, reducing their anxiety and improving their learning experience. Later, Tobar-Munoz, Baldiris, and Fabregat (2017) have used AR game-based learning to enhance reading comprehension among 3rd to 6th graders. Students enjoyed the activity more and provided more detailed answers to opinion-based questions compared to traditional reading.

Moreover, Carrion-Robles, Espinoza-Celi, and Vargas-Saritama (2023) have reported that 'Assemblr Edu', AR-based teaching materials, have significantly improved distance learners' writing skills by creating a realistic and engaging learning environment. This technology enhances motivation, multisensory learning, and self-learning. They state that interactive 3D AR elements help students learn new vocabulary, grammar, and punctuation, leading to better paragraph writing. This can be attributed to the platform's flexibility, which allows students to study at their own pace, access materials anytime, and revisit content as needed. Overall, distance learners have found 'Assemblr Edu' effective in supporting their learning and improving their writing performance.

In addition to some technical drawbacks and limitations of using AR in the writing classroom, Dolgunsöz, Yıldırım, and Yıldırım (2018) stated that the students found using AR in the class amusing, motivating, and creative. It was able to provide a real-life environment that allowed the students to be more engaged and involved in the learning process. This could be a result of the first-time effect of using technology in learning. They suggested that AR should be embedded in the curriculum and should be tested in a long-term language instrument to measure its effectiveness.

In another study conducted by Acar and CAVAS (2020), using Samsung Gear VR in teaching writing had been proven to have a positive impact on the students' performance, cognitive skills, and self- learning. The aim of their study was to investigate the effect of virtual reality enhanced learning environment on the7th-grade students' academic achievements on reading and writing in English within the scope of the experimental application. The use of VR in the classroom has proved to be a very helpful tool in increasing students' engagement; therefore, enhancing their reading and writing skills (Acar & CAVAS, 2020).

The online interactive platforms provide real-time communication enhancing feedback and engagement in English writing classrooms (Zhai, 2023). Students on these platforms reported higher interactivity levels in their writing methods compared to traditional approaches. In addition, the VR scenarios enriched students' experiences and increased their motivation to get engaged in writing. Zhai (2023) asserts that the students' enthusiasm significantly improved after using online and VR methods. The use of VR not only made the classroom interesting and fun, but also the results indicated the effectiveness of online interactive platforms and VR in enhancing writing skills. Despite these promising results, there are still relatively few studies on VR and AR integration into the English language teaching and learning process. For the current study, the adopted theoretical framework integrates the constructivist learning theory, where students are expected to construct knowledge through interaction with the Augmented Reality (AR) platform (EON-XR) representing enhanced technology learning and the cognitive load theory where students' cognitive load is expected to be reduced by enhancing academic writing skills development. It employs an AR platform as a pedagogical intervention mediated tool through which the students' perception and attitude towards learning can lead to satisfaction and academic writing improvement.

3. Statement of the Problem

Based on the previous review of literature, the collected data from the survey, and the collected data from the participants, the researchers felt the need to shed light on the students' satisfaction level in using Augmented reality (AR) in learning English writing for academic purposes considering educational technology philosophy: constructivism and connectivism. Constructivist learning occurs through active engagement and virtual interaction through adaptive learning platforms (EON-XR platform). Moreover, knowledge is distributed across networks, and learning occurs through connections. This aligns with AI-powered personalized learning and online communities (connectivism). Therefore, this current study aims to examine students' perceptions and attitudes towards using the Augmented Reality

platform (EON-XR) to enhance their academic writing skills.

4. Methodology

The conceptual framework of this study, illustrated below in Figure 1, includes its description, aims, significance, questions, duration, participants, design, procedures, instruments, and assessment.

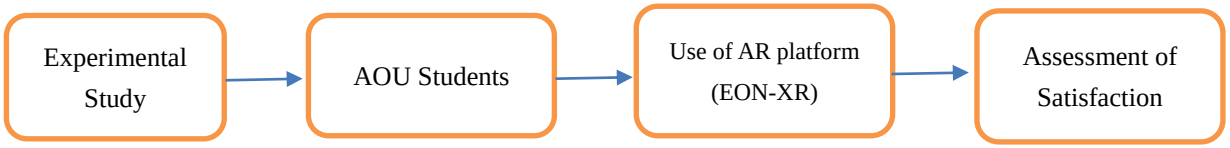

Figure 1. Schematic Diagram of the Experimental Study

4.1 Description

The web-enabled AR (EON-XR) integrates virtual reality (VR) technology into web platforms to create immersive and interactive augmented reality (AR) learning experiences. EON-XR is a platform developed by EON Reality, designed to enable users to create, share, and experience AR content directly through web browsers without the need for extensive hardware requirements. It facilitates the use of both AR and VR, allowing educators and trainers to design realistic simulations, interactive 3D models, and virtual environments that can be accessed by learners via various devices, including desktops, tablets, and smartphones (EON Reality, 2023).

One key advantage of EON-XR is its accessibility, as it does not require high-end VR headsets; users can experience the content through standard devices with internet connectivity. This makes it ideal for educational settings where resources may be limited. The platform supports a wide range of applications, including medical training, industrial skills development, and classroom education, by providing hands-on, experiential learning that helps enhance understanding and retention of complex concepts. Additionally, EON-XR includes features for creating and customizing learning modules, integrating multimedia content, and tracking user progress, which can facilitate more personalized and effective learning experiences (EON Reality, 2023).

The use of EON-XR in education aligns with constructivist learning theories, which emphasize the importance of active participation and contextual learning in knowledge acquisition. By engaging learners in interactive simulations, EON-XR enables them to apply theoretical knowledge in practical scenarios, fostering deeper understanding and skill development. Moreover, its web-enabled nature supports collaborative learning, allowing multiple users to participate in the same virtual environment simultaneously as can be seen in Figure 2 below.

Figure 2. EON-XR Visualization Captured from EON Reality (2023)

4.2 Aims and Objectives

This study aims to investigate AOU students' satisfaction with using an AR platform to develop their academic writing skills. The findings are expected to benefit educators and tutors by advancing and enhancing educational settings through AI tools, reshaping teaching practices with intelligent tutoring systems and personalized learning experiences, and addressing challenges related to technical issues and equitable access to AR as a teaching and learning tool. Additionally, the study will highlight the importance of assessing students' readiness in terms of both technological and pedagogical knowledge when integrating AR applications into education.

4.3 Research Significance

This study is supposed to be of great help to educators and students in investigating the level of satisfaction while using AR applications

to improve and develop some of their skills, especially academic writing skills, as additional learning resources, which could be beneficial in the adoption of intelligent tutoring systems. AR can bridge the gap between real and virtual learning experiences; AR systems can be either marker-based, using physical markers (QR codes or specially designed images) to transfer digital content, or marker-less, using technologies like image recognition to integrate virtual elements without special reference objects. Moreover, AR integrates with the Real World and enhances the real world by overlaying computer-generated perceptual information onto real-world objects, creating an interactive experience for students to maximize their engagement. Finally, AR technology has greatly evolved, and early forms have been gradually replaced or complemented by more advanced, user-friendly methods, such as mobile devices and smart glasses, which have made AR accessible to a wider range of users and applications.

4.4 Research Questions

This study aims to investigate AOU students' satisfaction level in using an AR platform to develop their Academic writing skills by answering the main question and its sub-questions.

Main Question

To what extent do AOU students find using the Augmented Reality (AR) program beneficial in developing their academic writing?

Sub-Questions

- What is the nature of the AR platform used in this study?
- Is there a gender-based difference in interest or availability for using the AR platform?
- To what extent do AOU students find the AR platform satisfactory?
- To what extent do AOU students find the AR platform helpful in developing their academic writing skills?

4.5 Duration

The implementation started in the first semester of the academic year 2023/2024 when the researchers started receiving training on how to design experiences on the EON-XR platform and continued through the second semester of the academic year 2023/2024 when AOU students registered in the EL117 Academic Writing course started using the platform.

4.6 Participants

The participants in this study are 235 students (167 females and 68 males) registered in the first major compulsory course (EL117), Academic Writing Level 1, at the Arab Open University (AOU), Kuwait Campus, during the second semester in the academic year 2023/2024. All these participants are students in the Faculty of Language Studies (FLS). They have completed the foundation prerequisite level. The collected data for this study consisted of a questionnaire (reviewed and validated by a specialist in the field) distributed to the students by the end of the semester after the students were trained in using EON-XR as a self-learning tool to develop their academic writing skills. Of the total number of samples distributed, only 120 samples were accepted for the analysis, and the rest were disqualified and removed for not fulfilling the requirements and the needs of this study, such as confirming using the AR platform (EON-XR) at least once and completing all sections in the questionnaire.

4.7 Design, Procedures, and Instruments

Mixed methods research design with quantitative and qualitative data analysis is adopted to systematically detect the satisfaction of AOU students in using the EON-XR platform to develop their Academic Writing Skills. The research design focuses on measuring AOU students' perceptions of using the EON-XR platform for academic writing development using one group of participants, all of whom engage with the EON-XR platform as part of their academic writing practice. The focus is on understanding students' satisfaction, engagement, and perceived effectiveness of the AR-based tool. Quantitative analysis is represented in using a questionnaire to measure students' satisfaction levels and perceived benefits of the platform, while qualitative analysis is represented in open-ended responses, student reflections, and focus group discussions to have deeper insights into students' experiences, challenges, and overall impressions of using AR for writing skills development.

Seven realistic simulation experiences have been designed by the main researcher through the EON-XR platform and posted on the Central Learning Management System (CLMS) for AOU students to access via various devices, including desktops, tablets, and smartphones. The realistic simulation experiences have been designed to assist AOU students in developing and improving their sub-writing skills and some mechanics of writing, such as building accurate sentence structure, avoiding run-on and fragmentation, and identifying comma splices and the power of punctuation marks. In addition, some realistic simulation experiences discussed how to build introductory, body, and concluding paragraphs to develop AOU students' writing of some rhetorical patterns, namely narrative, cause and effect, comparison, and argumentative essays, as can be seen from the captured screen shots, figures 3,4,5, and 6.

Moreover, an instrumental tool (questionnaire) has been designed to collect data and identify the students' satisfaction level in using the EON-XR platform as a learning writing tool inside and outside the classroom. It was developed by researchers to evaluate AOU students' attitudes towards using the seven simulation experiences while performing some written tasks. This tool consists of twenty-four items divided into six sections, rated by the researchers and another tutor for achieving inter-rater reliability to calculate the satisfaction of students in using AR. The Cronbach's Alpha for this tool's responses is 0.51, indicating moderate internal consistency.

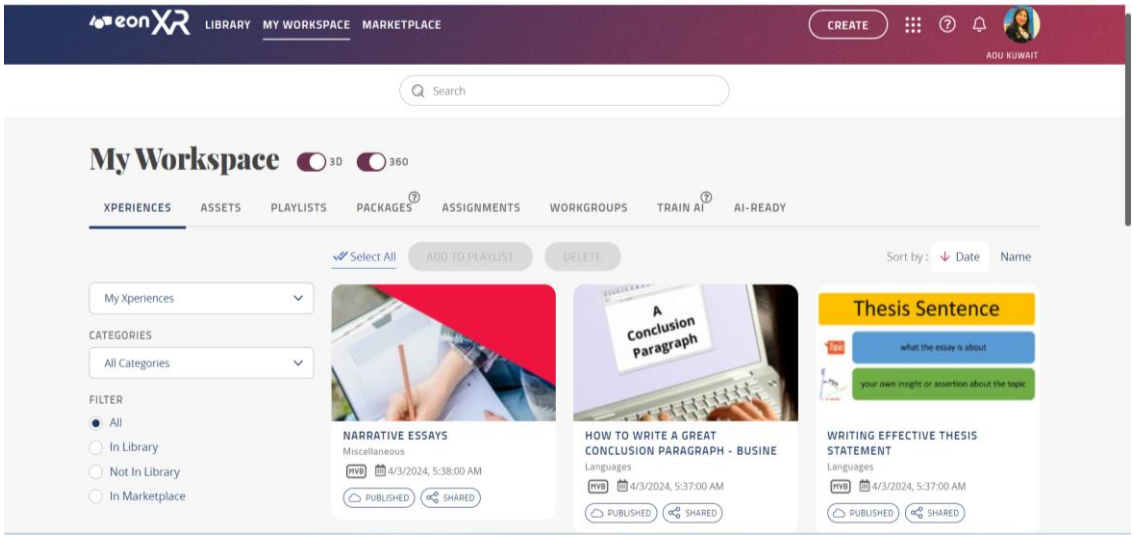

Figure 3. EON-XR 3 Experiences Captured from EON Reality (2023)

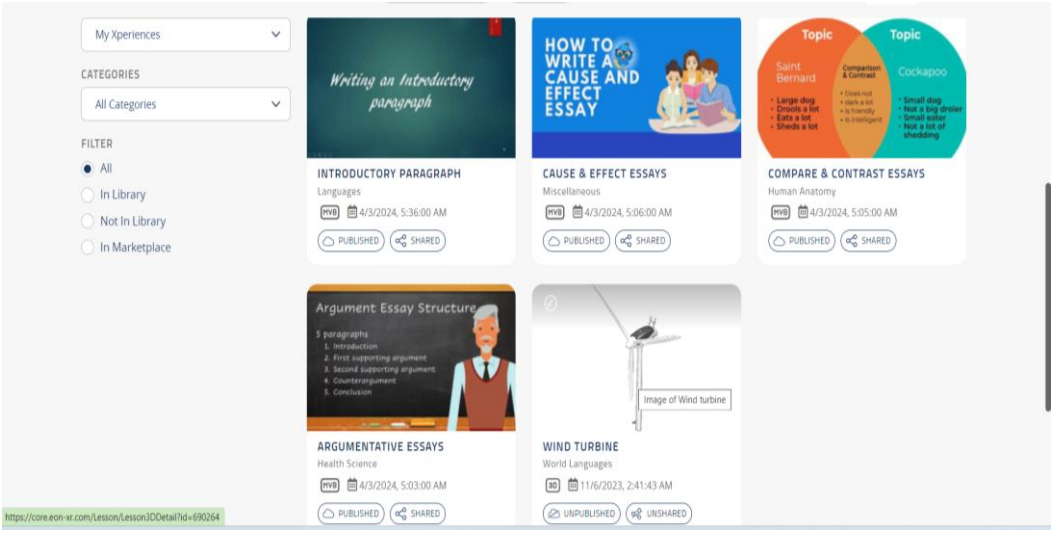

Figure 4. EON-XR 4 Experiences Captured from EON Reality (2023)

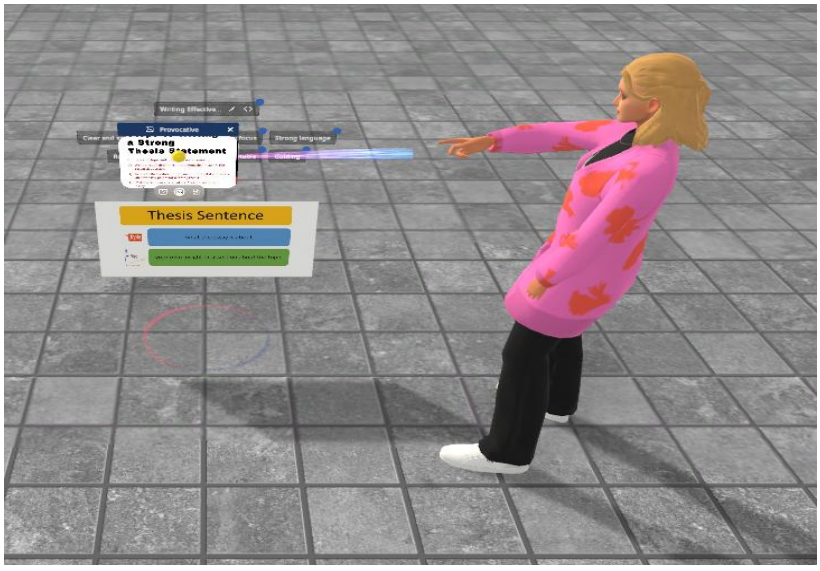

Figure 5. EON-XR AR Avatar Explanation Captured from EON Reality (2023)

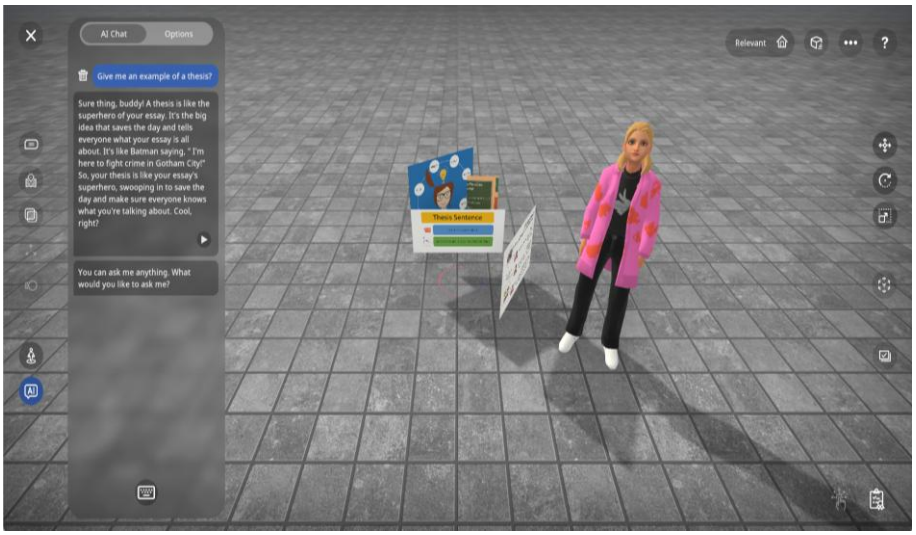

Figure 6. EON-XR AR Avatar Chat Box Captured from EON Reality (2023)

5. Findings and Discussion

Quantitative and qualitative data analysis is adopted to systematically detect the satisfaction levels of AOU students in using the EON-XR platform to develop their Academic Writing Skills. The quantitative data have been collected from eighteen items in the questionnaire. The following charts provide a clear breakdown of the demographics as raised in the research questions. Gender distribution indicates that there is a higher proportion of females (71%) compared to males (29%), which could suggest gender-based differences in interest or availability for the context being analyzed (Figure 7). This percentage is considered in analyzing the following data.

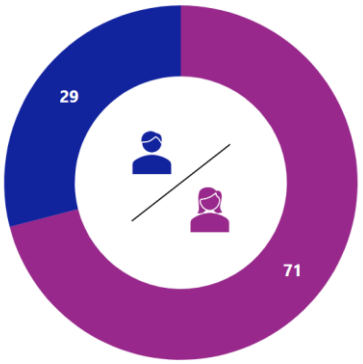

Figure 7. Participants' Gender Percentages

The age distribution represented in Figure 8 below reflects a wide range of varied age groups. The majority (65%) are in the 18-24 age group, indicating a young population, while the older age groups are less represented, with only 2.5% aged 45 and above. The participants' age group range was 65% (from 18 to 24 years old), 22.5% (from 25 to 34 years old), 8.3% (from 35 to 44 years old), and 2.5% (from 45 years old and above).

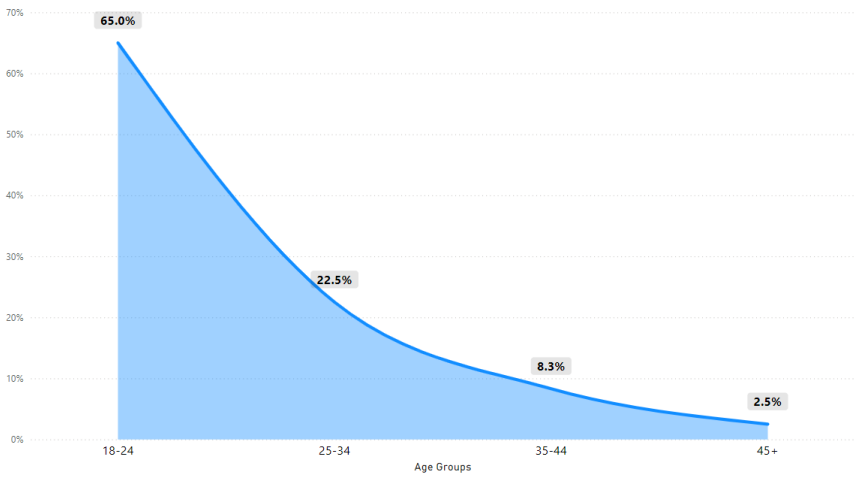

Figure 8. Participants' Age Group

Educational level distribution can be seen in Figure 9 below. Most participants are at Level 1 (70%), followed by Level 2 (26.6%), with a minimal representation at Level 3 (3.3%), indicating concentration at the entry-level stage. The majority of the participants fall into the first education level (70%) since EL117 (Academic Writing) is a level one course. However, some participants fall into the second level (26.6%) because they are repeaters who failed the course. Other participants belong to the third level (3.3%) who joined the course based on their request to increase their GPA. The data suggests a young, predominantly female demographic with a focus on early educational stages.

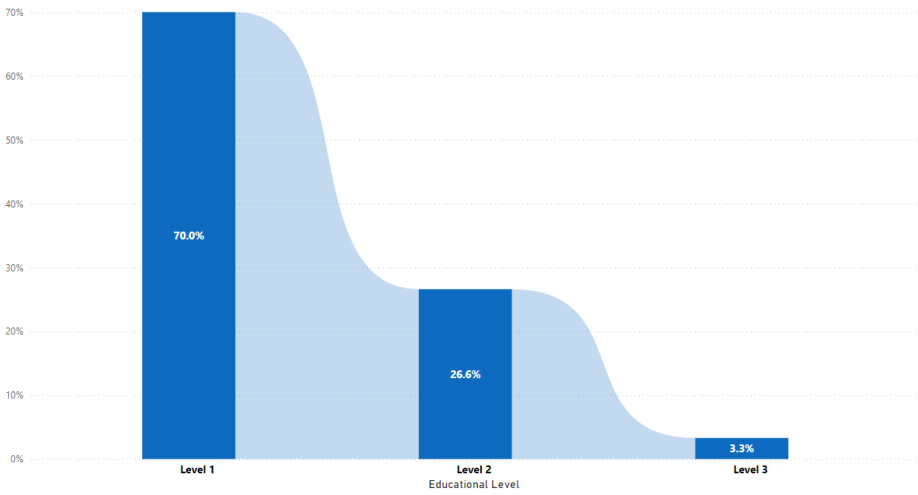

Figure 9. Participants' Educational Level

Table 1 and Figure 10 below represent the participants' frequency of using the EON-XR platform. The participants responded that 7.5% of them were always using it daily, 27.5% were using it weekly, and 15.8% were using it monthly. Only 17.5% reported that they have never used it, and 30% reported rarely using it.

Table 1. Participants' Frequency of Using EON-XR

Frequency	Daily	Weekly	Monthly	Rarely	Never
	7.5%	27.5%	15.8%	30%	17.5%

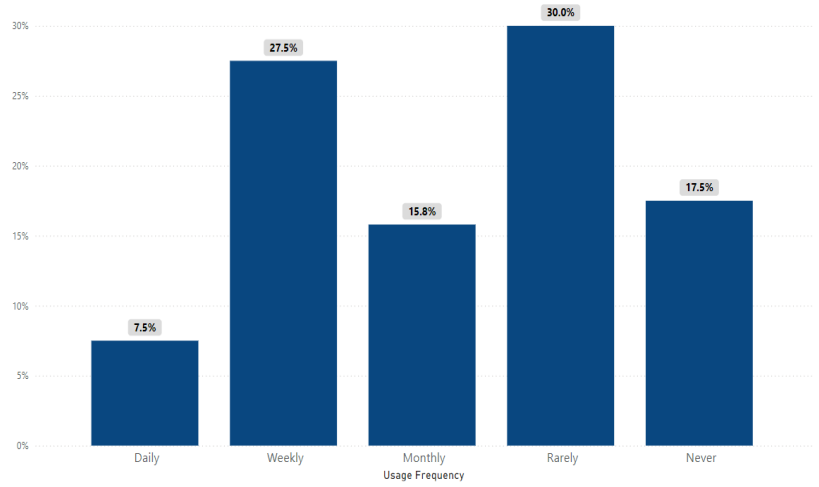

Figure 10. Participants' Frequency of Using EON-XR

As per investigating the participants' purpose for using the EON-XR platform, 39% of them responded that they used it for class assignments, 37.5% used it for independent study, 18% used it for group projects and only 11% used it for extracurricular activities as represented in table 2 and Figure 11 below. The majority of the participants used the platform for class assignments, which correlates with the weekly usage as seen in Figure 9 above.

Table 2. Participants' Purpose of Using EON-XR

Purpose	class Assignments	Independent study	Group project	Extracurricular Activities
	39%	37.5%	18%	11%

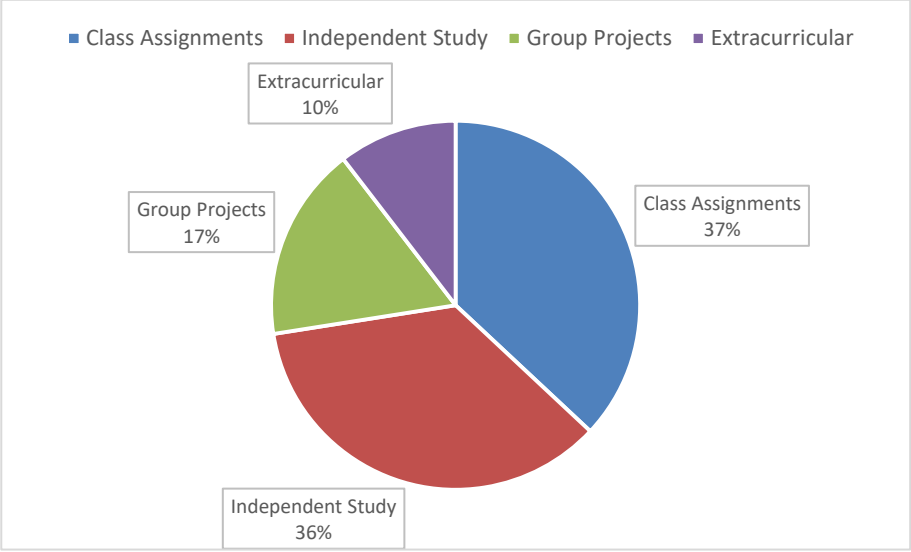

Figure 11. Participants' Purpose of Using EON XR

Table 3 and Figure 12 below represent the duration spent by the participants using the EON-XR platform. When they were asked about how long they had been using the platform, they responded that 25% of them used it for less than 1 week, and 19% of them used it for more than 1 month.

Table 3. Participants' Duration of Using EON-XR

Duration of Usage	Less than 1 week	1 Week	2 Weeks	3 Weeks	More than 1 month
	25%	17%	22%	25%	19%

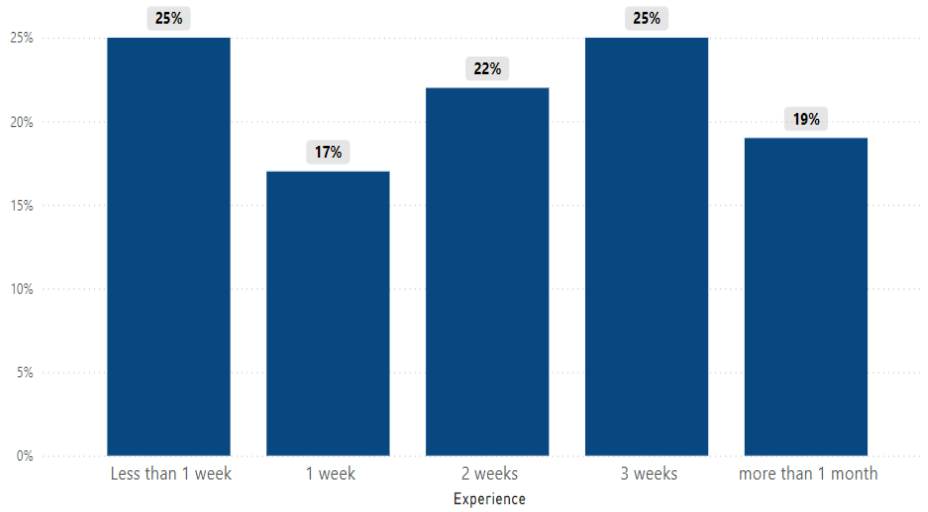

Figure 12. Participants' Duration of Using EON XR

As seen in Table 4 and Figure 13, when the participants were asked about their satisfaction level while using the EON-XR platform, the majority (57.5%) reported their neutral satisfaction towards the platform, while only 11.6% of them expressed their dissatisfaction. 9.16% of them were very satisfied, and 17% were satisfied. The neutral responses indicate uncertainty or unfamiliarity, suggesting that users' training could improve their perceived ease of use. Since a considerable portion of students do not find the platform difficult, it suggests a moderate level of acceptance but also highlights areas where usability can be enhanced to improve adoption. The neutral responses indicate that many students are still in the early or late majority stage of technology adoption.

Table 4. Participants' Usage Satisfaction of Using EON-XR

Usage Satisfaction	Very Satisfied	satisfied	Neutral	Dissatisfied	Very Dissatisfied
	9.16%	17%	57.5%	6.6%	5%

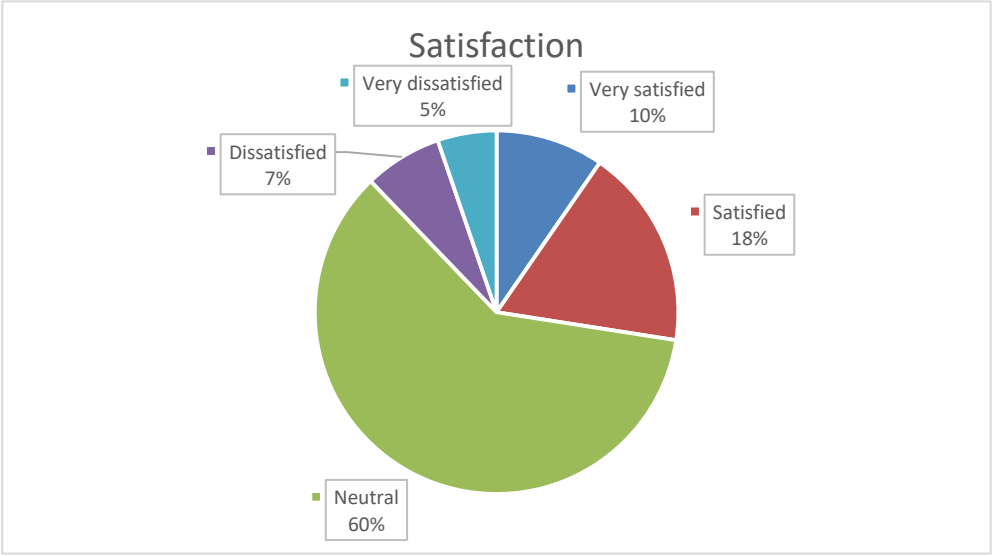

Figure 13. Participants' Usage Satisfaction with Using EON XR

When participants were asked about the level of difficulty they faced while using the EON-XR platform, 34.1% of them reported that it was user-friendly and easy to use, while 46.6% found the level of difficulty neutral. Only 20% of the students found the platform difficult to use, as can be seen in Table 5 and Figure 14 below. These mixed perceptions suggest a need to align AR integration with established educational theories to enhance writing instruction, such as educational technology (EdTech), user experience (UX) design, and cognitive load theory.

Table 5. Participants' Difficulty Level while Using EON-XR

User friendly	Very Easy	Easy	Neutral	Difficult	Very Difficult
	8.3%	25.8%	46.6%	14.1%	5.8%

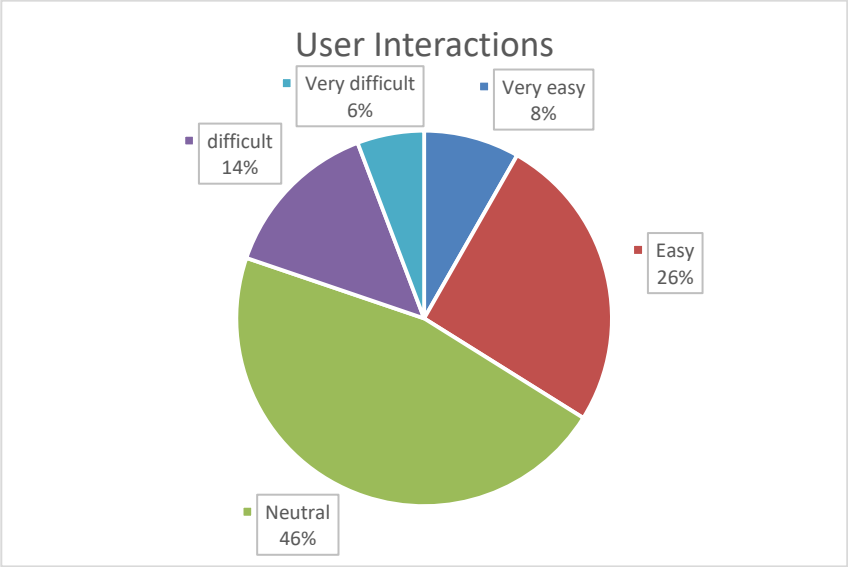

Figure 14. Participants' Difficulty Level while Using EON-XR

When investigating the participants' satisfaction level towards the quality of the EON-XR augmented reality features, 43.3% answered good, only 11.6% believed that it is excellent, and 3.33% chose very poor, as represented in Table 6 and Figure 15 below. AR tools, such as EON-XR, reduce extraneous cognitive load by providing visual and interactive learning environments (3D models of essay structures or interactive grammar explanations). However, if the platform itself is difficult to navigate, it may increase cognitive load, distracting from the writing process rather than supporting it.

Table 6. EON-XR Quality of AR

Quality of AR	Excellent	Good	Average	Poor	Very Poor
	11.6%	43.3%	34.1%	5%	3.33%

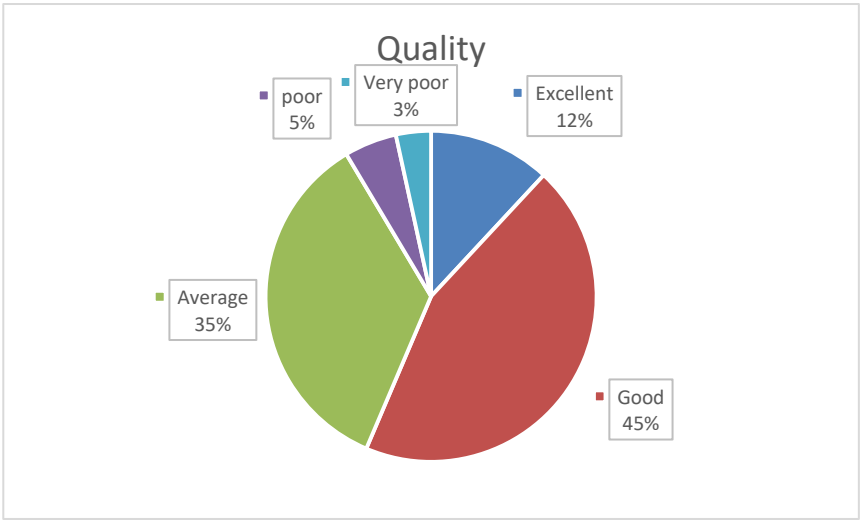

Figure 15. EON-XR Quality of AR

Regarding the participants' views of the EON-XR platform as a tool for enhancing their academic writing skills, the majority (46%) chose neutral, 10% reported it was effective, and only 3% found it was very inefficient, as evident in Table 7 and Figure 16. AR platforms like EON-XR enhance writing development by offering interactive writing tutorials (guides on structuring essays) and AI-driven grammar and style suggestions embedded in an AR environment. Nonetheless, if the AR platform is not perceptive, students may struggle to focus on writing tasks.

Table 7. EON-XR Enhancement Level of Academic Writing

Level of Enhancement	Very effective	Effective	Neutral	Ineffective	Very ineffective
	10%	31%	46%	10%	3%

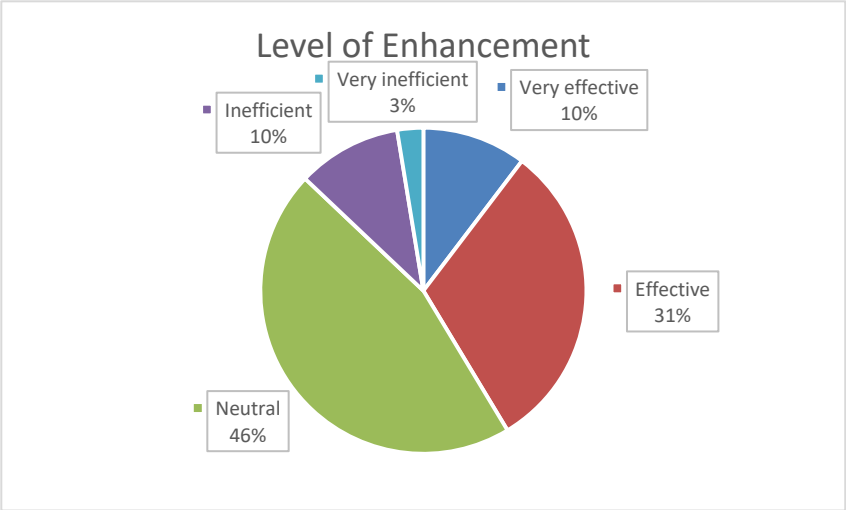

Figure 16. EON-XR Enhancement Level of Academic Writing

By asking the participants if they had encountered any technical issues while using EON XR, 29% of them responded rarely, and 24.1% never, while only 9.1% reported always (Table 8). If students struggle with usability, it may hinder their ability to engage in active learning using the platform, which is not the case in this study. When a significant proportion of users find the platform easy to use, it implies that the intrinsic and extraneous cognitive load is manageable.

Table 8. EON-XR Technical Issues

Technical issues	Never	Rarely	Occasionally	Frequently	Always
	24.1%	29%	23.3%	14.1%	9.1%

Asking participants to rate the quality of the content (writing experiences) available on the EON-XR platform and its provided resources, their answers varied. In response to the quality of the provided content, 39% of them reported it was good, 20% responded it was excellent, and 4% stated it was very poor, as shown in Table 9 and Figure 17 below. A well-designed AR writing environment should simplify navigation and focus on scaffolding writing skills rather than overwhelming students with complex content and instructions. Academic writing relies on linguistic processing, but multimodal learning theory suggests that visual and interactive elements can enhance comprehension and retention.

Table 9. EON-XR Quality of Content

Quality of Content	Excellent	Good	Neutral	Poor	Very Poor
	20%	39%	25%	12%	4%

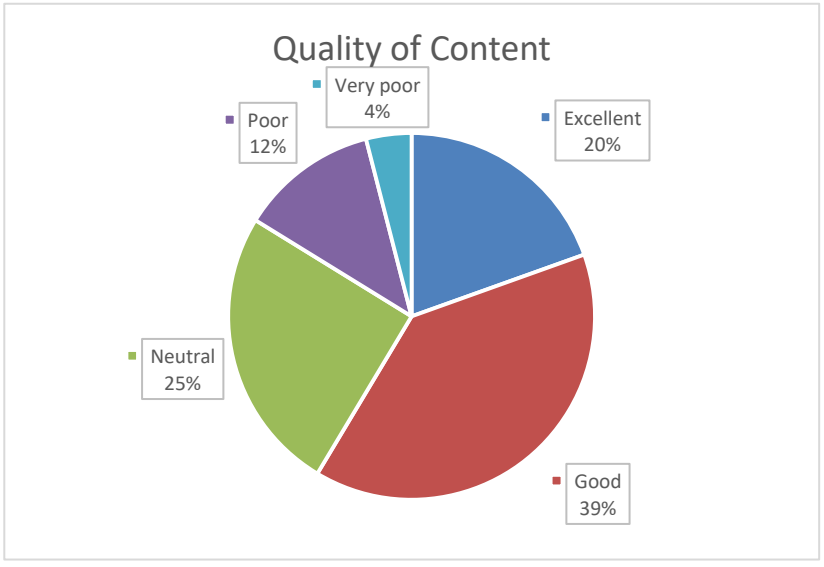

Figure 17. EON-XR Quality of Content

When participants were asked about whether the EON-XR platform provides content relevant to their academic writing courses, 21% of them reported it always has relevance to the course content (EL117), 27% often and 36% sometimes while only 16% reported that it has rare or no relevancy to the academic writing course materials as shown in the following Table 10 and Figure 18. The EON-XR platform presents writing concepts in 3D models (interactive paragraph/essay structures). It uses voice and animation to explain writing techniques, providing real-time feedback through virtual tutors.

Table 10. EON-XR Relevancy to Course Material

Relevancy	Always	Often	Sometimes	Rarely	Never
	21%	27%	36%	9%	7%

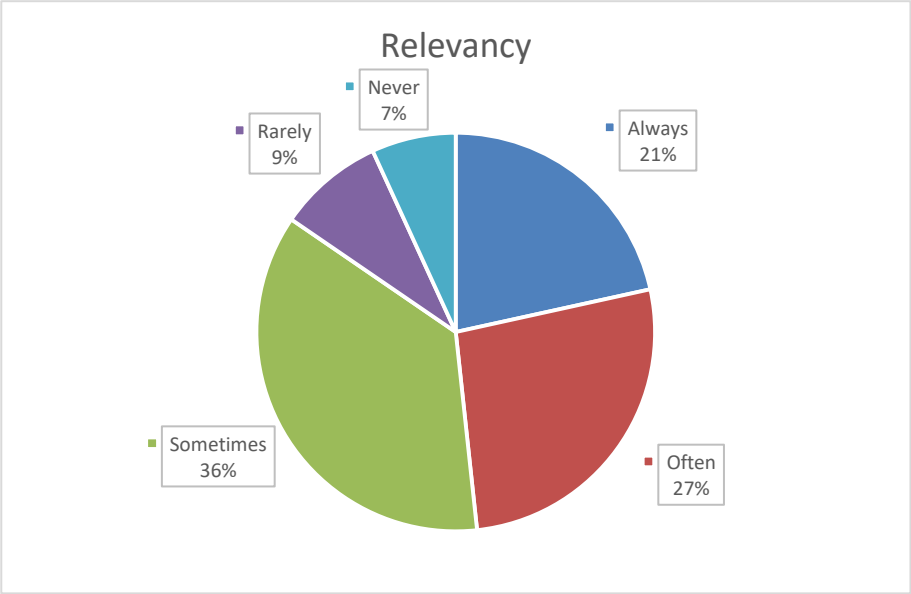

Figure 18. EON-XR Relevancy to Course Material

As for the sufficiency of the content provided by the EON-XR platform, 49% of the participants answered that they were not sure if the content was sufficient, and 40% reported it was sufficient (Figure 19). AR tools like the EON-XR should balance visual interactivity with cognitive content clarity, ensuring that the technology supports rather than distracts from writing improvement. If AR platforms are not innate, students may struggle to focus on writing tasks.

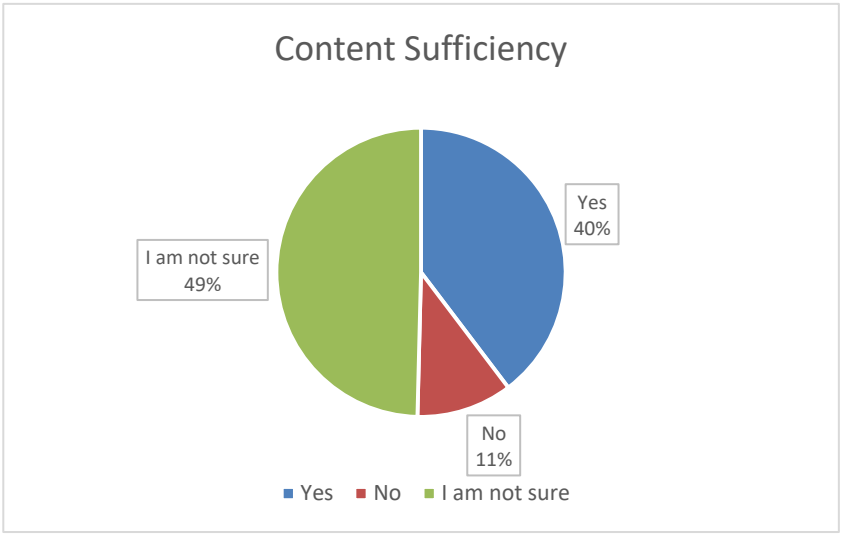

Figure 19. EON-XR Content Sufficiency

When asked what content to be added to the EON-XR platform, 37.5% answered adding tutorials, 10% interactive simulation, 20.8% virtual tutor, 12.5% 3D models, and 15.8% adding case studies, as can be seen in Table 11 and Figure 20 below.

Table 11. Added Items to EON-XR Content

Add to Content	Tutorials	Interactive simulations	Virtual Tutor	3D models	Case studies
	37.5%	10%	20.8%	12.5%	15.8%

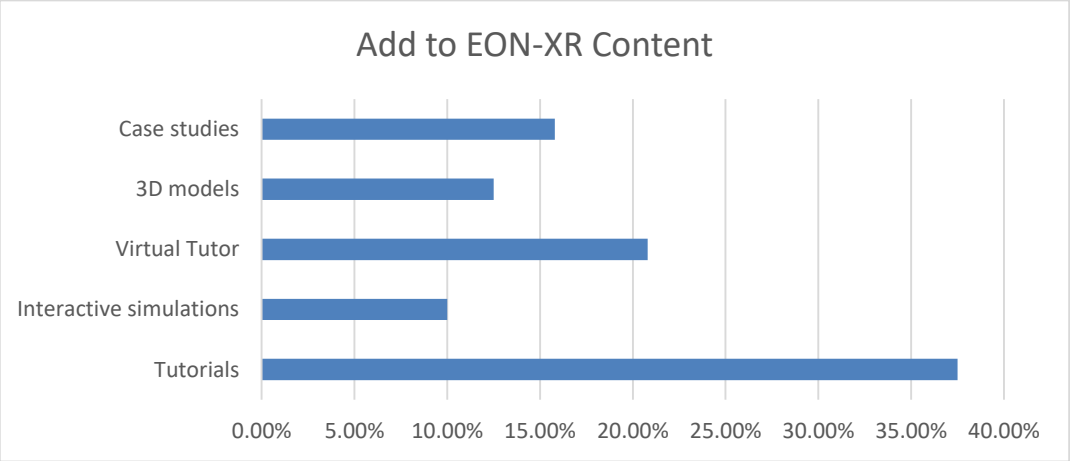

Figure 20. Added Items to EON-XR Content

Concerning the impact of the EON-XR on the participants' level of engagement, the answers are varied. When the students were asked whether using the platform makes them more engaged with their studies, 13% strongly agreed, 33% agreed, 42% were neutral, while 10% disagreed and only 2% strongly disagreed (Figure 21).

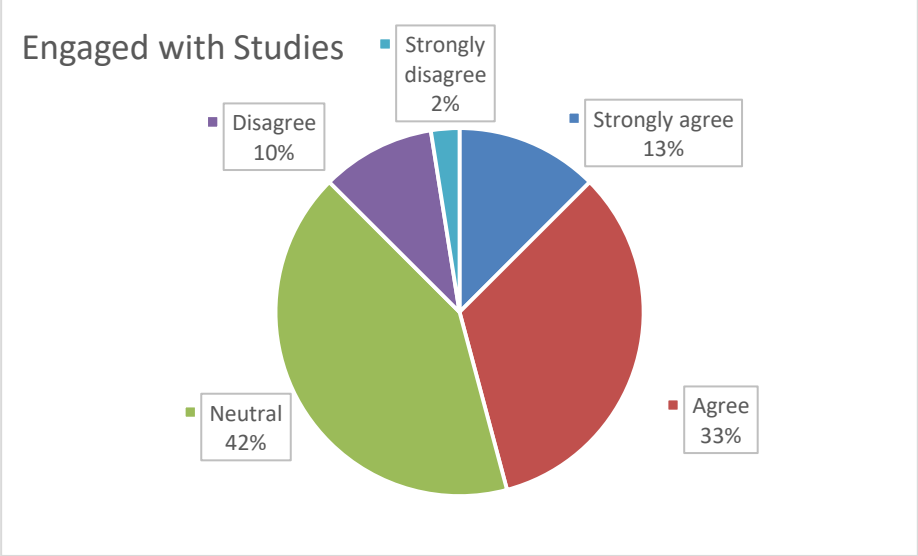

Figure 21. Participants' Level of Engagement

For understanding complex concepts, 41% showed a neutral attitude, while 38% of the participants agreed that EON-XR helped in understanding complex problems, and only 4% strongly disagreed, as presented in the following Figure (22).

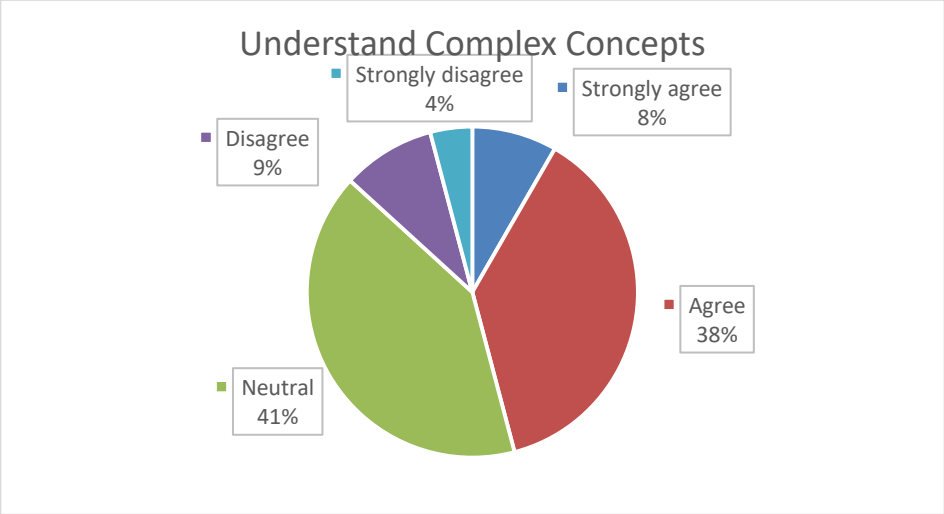

Figure 22. Participants' Level of Understanding Complex Concepts

When asked if they recommend the EON-XR to others, 28% of the participants reported that they probably recommend it, while 24% replied they definitely recommend, and only 6% answered definitely not (Figure 23).

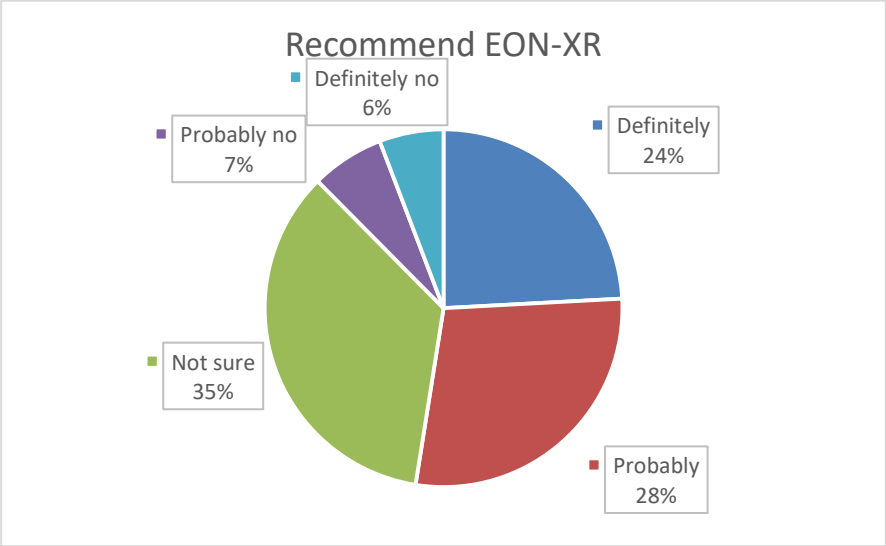

Figure 23. Participants' Recommendation

As for the qualitative results, the students have responded to five questions, stating their views on what they liked or did not like about the EON-XR platform, suggesting ways of improving it. A good number of students provided positive comments on the effectiveness of the EON-XR platform, highlighting how it helped them in practicing mechanics of writing some rhetorical patterns, such as narrative, cause and effect, comparison, argumentative essays via the avatar chatbot, and MCQ quizzes. Other students stated that they encountered some technical issues related to accessibility and layout. They reported difficulty accessing via the Android or iOS system. Some students suggested adding a detailed training tutorial to the platform itself, not only on the website, to facilitate using it, making it more user-friendly.

To sum up, the analysis of EON-XR platform data reveals valuable insights into the demographic profile, usage patterns, user experience, content quality, and the impact on learning of this platform. It is mainly utilized for class assignments and independent study, although a significant portion of users rarely engage with it daily. As findings have proven, there was some resistance towards using the new technology since the majority of the students have expressed having a neutral attitude rather than a supportive or an opposing one, as shown in the quantitative data. This could be attributed to the fear of change from traditional to modern technology-based means of learning, as indicated in the qualitative responses. The small number of students who supported using EON-XR proved that EON-XR is an educational tool that was used successfully in improving and developing their academic writing skills. Therefore, it is concluded that there is a need to reduce unnecessary cognitive load by improving the platform usability to maximize AR platforms like EON-XR's potential in improving academic writing skills. It is also advisable to enhance scaffolding features to support different writing levels, highlighting the value of using AR in writing enhancement and ensuring multimodal learning benefits without overwhelming users.

5. Conclusion and Recommendation

Adopting Augmented Reality (AR) for enhancing AOU students' academic writing skills remains a debatable issue. The use of the EON-XR platform has proven to be rather effective in providing varied, relevant, complex content related to the target academic course materials at different levels of difficulty. It has also been proven that the platform is effective in increasing students' level of engagement since it provides an authentic learning environment that enhances interactive learning at varied levels. AR is offering a more interactive and engaging method of delivering information to accommodate, assimilate, and authentically transfer knowledge, reinforcing language learning, especially academic writing skills. As a result, integrating AR into educational practices increases students' motivation, engagement, and self-learning via employing multisensory learning experiences. Use of 3D interactive visual elements arouses students' curiosity, encouraging them to get more exposure to the target language, improving their comprehension level of complex writing concepts, such as structure, cohesion, and mechanics of academic writing. This could improve their production of different types of paragraphs in different rhetorical contexts. The adaptable features of AR and its type of material enable learners to access the materials at any time and on any device with an internet connection.

The results support the application of the constructivist learning experience, which enhances active, experiential, and learner-centered interactions. The students perceived the AR platform as a useful educational tool to facilitate academic writing skills. The statistical analysis of the students' responses indicates that the users' satisfaction level appears to be indifferent, with a majority rating their experience with EON-XR as neutral. While some users acknowledge the quality of the AR features, technical issues and a lack of differentiated content further contribute to the mixed feedback. The demand for additional resources stresses the need for EON-XR to enhance its elements, particularly in providing tutorials and interactive simulations in its created experiences. Ultimately, the varying perceptions of EON-XR's impact on learning highlight the necessity for ongoing improvements and adaptations to better meet the needs of its users.

Since educational technology continues to evolve, it is recommended to keep gathering and acting upon users' feedback. This will be essential for maximizing the platform's effectiveness in enhancing student engagement and learning outcomes. It is also recommended to incorporate other AR platforms as complementary tools for teaching academic writing via stimulating a 3D model illustrating the argumentative features of counterarguments. Educators should design authentic goal-oriented writing tasks that meet the intended learning outcomes and assessments. In addition, AR platforms can easily be embedded into blended learning environments which facilitate accessibility to the AR platform at any time promoting autonomous learning and reducing classroom dependency. It is advisable to provide instructional tutorials and interactive simulation of AR platforms. Overall, according to AOU students' view, EON XR was considered as a rather effective tool to involve them in an active multimodal writing process which includes interpreting data, visuals and digital content to stimulate real-world writing contexts.

Acknowledgments

We greatly appreciate the valuable support of the research committee members at the Arab Open University (AOU), Kuwait. We would also like to thank the AOU research committee for providing insight and expertise that greatly assisted the current research. We would also like to thank every team member who took the time to participate in this study.

Authors' contributions

Dr. Marine Milad and Ms. Fatema Fayez were responsible for the study, design, and revision. Dr. Marine Milad drafted the manuscript and wrote the abstract, introduction, methods, results, discussion, and conclusion. She also developed the questionnaire used in the study and seven augmented reality experiences on the EON-XR platform. Ms. Fatema Fayez wrote the review of literature, and she was responsible for collecting data and calculating percentages of the findings. Both authors read and approved the final manuscript. The first/ main author, Dr. Marine Milad, has written 70% of the work, starting with developing a thesis statement to wording the study findings. The second author, Ms. Fatema Fayez, has written 30% of the work. Her contribution was writing the literature review, collecting the data, entering it, and analyzing the data, in addition to proofreading the paper.

Funding

This work was supported by the Arab Open University (AOU), Kuwait.

Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Sciedu Press.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

Not commissioned; externally double-blind peer reviewed.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

References

Abadia, R., Fritsch, J., Abdelaal, S., & Jayawickrama, T. (2024). Opportunities overcome challenges in adopting immersive virtual reality in online learning. *Computers and Education Open, 7*, 100208. https://doi.org/10.1016/j.caeo.2024.100208

Acar, A., & Cavas, B. (2020). The Effect of Virtual Reality Enhanced Learning Environment on the 7th-Grade Students' Reading and Writing Skills in English. *Malaysian Online Journal of Educational Sciences, 8*(4), 22-33. Retrieved from https://mjir.um.edu.my/index.php/MOJES/article/view/26395

Anantrasirichai, N., & Bull, D. (2022). Artificial intelligence in the creative industries: A review. *Artificial Intelligence Review, 55*, 589-656. https://doi.org/10.1007/s10462-021-10039-7

Billinghurst, M., Clark, A., & Lee, G. (2015). A Survey of Augmented Reality, Foundations and Trends in Human–Computer Interaction, 8 (2-3). Retrieved from https://www.nowpublishers.com/article/Details/HCI-049

Carrion-Robles, F., Espinoza-Celi, V., & Vargas-Saritama, A. (2023). The use of augmented reality through Assemblr Edu to inspire writing in an Ecuadorian EFL distance program. *International Journal for Engineering Pedagogy, 13*(2), 121-141. https://doi.org/10.3991/ijep.v13i5.38049

Chang, Y. J., Chen, C. H., Huang, W. T., & Huang, W. S. (2011). Investigating students' perception, satisfaction, behavioral intentions, and effectiveness of English learning using augmented reality. *ResearchGate*. Proceedings of the 2011 IEEE International Conference on Multimedia and Expo, ICME 2011, 11-15 July, 2011, Barcelona, Catalonia, Spain. Retrieved from https://www.researchgate.net/publication/221263948_Investigating_students'_perceived_satisfaction_behavioral_intention_and_effectiveness_of_English_learning_using_augmented_reality

Cook, M., Lischer-Katz, Z., Hall, N., Hardesty, H., McDonald, R., & Carlisle, T. (2019). Challenges and strategies for educational virtual reality: Results of an expert-led forum on 3D/VR technologies across academic institutions. *Information Technologies and Libraries, 38*(4), 25-48. https://doi.org/10.6017/ital.v38i4.11075

Dolgunsöz, E., Yıldırım, G., & Yıldırım, S. (2018). The effect of virtual reality on EFL writing performance. *Journal of Language and Linguistic Studies, 14*(1), 278-292. Retrieved from https://dergipark.org.tr/en/pub/jlls/issue/43213/527893

Elmqaddem, N. (2019). Augmented reality and virtual reality in education: Myth or reality? *International Journal of Emerging Technologies in Learning, 14*(3), 234-242. https://doi.org/10.3991/ijet.v14i03.9289

Fereina, L., & Ott, M. (2015). Literature review on immersive virtual reality in education: State of the art and perspective. *ResearchGate*. Conference: eLearning and Software for Education (eLSE)At: Bucharest (Romania). https://doi.org/10.12753/2066-026X-15-020

Gabbard, J. Mehra, D. & Swan, E. (2018). Effects of AR Display Context Switching and Focal Distance Switching on Human Performance. *IEEE Transactions on Visualization and Computer Graphics*, 99. https://doi.org/10.1109/TVCG.2018.2832633

Garzón, J., & Acevedo, J. (2019). An overview of twenty-five years of augmented reality in education. *Multimodal Technologies and Interaction, 3*(2), 1-14. https://doi.org/10.3390/mti3020011

Ibáñez, M., & Kloos, C., (2018), Augmented reality for STEM learning: A systematic review. *Computers and Education, 123*, 109-123. https://doi.org/10.1016/j.compedu.2018.05.002

Jamrus, M. H. M., & Razali, A. B. (2019). Augmented reality in teaching and learning English reading: Realities, possibilities, and limitations. *International Journal of Academic Research in Progressive Education and Development, 8*(4), 724-737. https://doi.org/10.6007/IJARPED/v8-i4/6696

Khabib, S. (2022). Introducing artificial intelligence (AI)-based digital writing assistants for teachers in writing scientific articles. *Teaching English as a Foreign Language Electronic Journal, 16*(1), 114-124. https://doi.org/10.12928/tefl.v1i2.249

Kipper, G., & Rampolla, J. (2012). *Augmented Reality: An Emerging Technologies Guide to AR. Syngress, USA.* Retrieved from https://www.researchgate.net/publication/290912126_Augmented_Reality_An_Emerging_Technologies_Guide_to_AR

Lee, K. (2012). Augmented reality in education and training. *TechTrends, 56*(2), 13-21. https://doi.org/10.1007/s11528-012-0559-3

Lege, R., & Bonner, E. (2020). Virtual reality in education: The promise, progress, and challenges. *JALT CALL Journal, 16*(3), 167-180. https://doi.org/10.29140/jaltcall.v16n3.388

Lui, T., (2009) A context-aware ubiquitous learning environment for language listening and speaking. *Journal of Computer Assisted Learning, 25*(6). https://doi.org/10.1111/j.1365-2729.2009.00329.x

Mahadzir, N., & Phung, L. F. (2013). The use of augmented reality pop-up to increase motivation in English language learning for national primary schools. *IOSR Journal of Research & Method in Education, 1*(1), 26-38. https://doi.org/10.9790/7388-0112638

Marzuki, W., Wadiati, U., Rusdin, D., & Indrawati, D. (2023). The impact of AI writing tools on the content and organization of students' writing: EFL teachers' perspective. *Cogent Education, 10*(1), 2151234. https://doi.org/10.1080/2331186X.2023.2236469

Milad, M., & Fayez, F. (2024). Your way AI way: Let's meet halfway—Paradigm shift in TEFL. *World Journal of English Language, 14*(5), 468-481. https://doi.org/10.5430/wjel.v14n5p468

Radianti, P., Majchrzak, T., Fromm, J., & Wohlgenannt, I. (2020). A systematic review of immersive virtual reality applications for higher education: Design elements, lessons learned, and research agenda. *Computers and Education, 147*, 1-29. https://doi.org/10.1016/j.compedu.2019.103778

Raja, M., & Priya, G. (2021). Conceptual Origins, Technological Advancements, and Impacts of Using Virtual Reality Technology in Education. *Webology, 18*(2), 116-134. https://doi.org/10.14704/WEB/V18I2/WEB18311

Sumakul, D. Y., Abdul Hameid, F., & Sukyadi, D. (2021). Students' Perceptions of the Use of AI in Writing Class. *Advances in Social Science, Education and Humanities Research, 624*, 52-57. Conference: 67th TEFLIN International Virtual Conference & the 9th ICOELT 2021. Retrieved from https://www.researchgate.net/publication/358844594_Students'_Perceptions_of_the_Use_of_AI_in_a_Writing_Class

Taskiran, A. (2018). The effect of augmented reality on English as a foreign language motivation. *E-Learning and Digital Media, 15*(5), 122-135. https://doi.org/10.1177/2042753018817541

Tian, H., Zulkifli, N., & Ayub, A. (2023), A Literature Review on Virtual Reality in Teaching Education, *International Journal in Academic Research in Business and Social Sciences, 13*(15), 299-306. https://doi.org/10.6007/IJARBSS/v13-i15/18787

Wu, H. K., Lee, S. W. Y., Chang, H. Y., & Liang, J. C. (2013). Current status, opportunities, and challenges of augmented reality in education. *Computers & Education, 62*, 41-49. https://doi.org/10.1016/j.compedu.2012.10.024

Yang, S. H. (2007). Artificial intelligence for integrated English oral practice and writing skills. *Sino-US Teaching English*, 1-6. Retrieved from https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=890d6e9570d7fd58a2404f8de1915c7e68973c41

Zhai, Q. (2023). Improvement of English writing skills through online interactive platforms and virtual reality technology. *Academic Journal of Humanities & Social Sciences, 6*(14), 74-80. https://doi.org/10.25236/AJHSS.2023.061413

Appendix (A)

EON XR Student Satisfaction and Experience Questionnaire

Please fill in each item below by choosing the option that best describes your experience with EON XR platform.

Part 1: Demographic Information

Age:	18-24	25-34	35-44	45+
Gender:	Male	Female		
Education Level at AOU:	Level 1	Level 2	Level 3	

Part 2: Usage of EON XR

1. **How frequently do you use EON XR?**

Daily	Weekly	Monthly	Rarely	Never

2. **For what purposes do you use EON XR? (Select all that apply)**

Class assignments	Independent study	Group projects.	Extracurricular activities

3. **How long have you been using EON XR?**

Less than 1 week	1week	2 weeks	3 weeks	More than 1 month

Part 3: User Experience

1. **Rate your overall satisfaction with EON XR:**

Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied

2. **How user-friendly do you find EON XR?**

Very Easy to Use	Easy to Use	Neutral	Difficult to Use	Very Difficult to Use

3. **Rate the quality of the augmented reality features:**

Excellent	Good	Average	Poor	Very Poor

4. **How effective is EON XR in enhancing your academic writing experience?**

Very Effective	Effective	Neutral	Ineffective	Very Ineffective

5. **Have you encountered any technical issues while using EON XR?**

Never	Rarely	Occasionally	Frequently	Always

Part 4: Content and Resources

1. **How would you rate the quality of the content (writing experiences) available on EON XR?**

Excellent	Good	Average	Poor	Very Poor

2. **Is the content on EON XR relevant to your studies (academic writing)?**

Always	Often	Sometimes	Rarely	Never

3. **Do you find the variety of content on EON XR sufficient?**

Yes	No	I am not sure

4. **What type of content would you like to see more of on EON XR? (Select all that apply)**

Tutorials	Interactive Simulations	Virtual Tours	3D Models	Case Studies

- Other (please specify): _____

Part 5: Impact on Learning

1. Do you feel more engaged with your studies when using EON XR?

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

2. Has EON XR helped you understand complex concepts better?

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

3. Would you recommend EON XR to other students?

Definitely	Probably	Not Sure	Probably Not	Definitely Not

Part 6: Additional Feedback

1. What do you like most about EON XR?

_____

_____

_____

2. What do you like least about EON XR?

_____

_____

_____

3. Have you encountered any technical issues? Please specify.

_____

_____

_____

_____

4. Do you have any suggestions for improving EON XR?

_____

_____

_____

5. Any other comments or feedback?

_____

_____

_____

Thank you for taking the time to complete this questionnaire. Your feedback is valuable in helping us improve the EON XR platform.