



Exploring Technology's Impact On English Language Learning In Online Tertiary Education

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ABSTRACT

The integration of technology in tertiary education has had a great impact on the nature of English language learning; students have flexibility, engagement, and the nature of accessibility in learning. This study explores how digital tools, mobile applications, artificial intelligence-driven language resources, and virtual classrooms affect language acquisition, probing into the enhancement factors of linguistic proficiency, learner autonomy, and motivation while detecting some key challenges such as digital literacy gaps, the lack of interaction, and accessibility concerns. Using a quantitative research design, this study investigates the computer self-efficacy relationship between perceived usefulness, perceived ease of use, attitude, and behavioral intention to adopt online language learning applications. Cronbach's alpha, Pearson's correlation coefficient, and structural equation modeling tools are used for assessing reliability, correlations, and overall effectiveness in technology-enhanced learning. Findings suggest that perceived usefulness and attitudes toward online learning are closely related, but the role of gender and experience is significant for technology acceptance. The study also emphasizes the opportunity of digital environments in creating more interactive and personal experiences in language learning while drawing attention to pedagogical practice in bridging existing gaps. By bringing about insights on optimizing technology in use for language learning, there can be enlightenment to the policy-makers and educational stakeholders in ways that would advance fair access, enhanced learning.

Keywords: Technology integration, Tertiary education, English language learning, Digital tools, Mobile applications, Artificial intelligence

1. INTRODUCTION

Technology integrated into education can transform the acquisition and engagement of knowledge for students in general, but with regard to language learning, it has revolutionized the way that educational processes are carried out (Ahmadi, 2018; Hazaymeh, 2021). As the most widely used global lingua franca, English has undergone significant transformations in the context of teaching and learning through digital tools and online platforms (Khan, 2019). Technology has thus emerged as a must-have support for interactive, flexible, and personalized learning in tertiary education where the advanced linguistic competencies students acquire for academic and professional purposes.

Online learning environments present multiple opportunities for acquiring the English language through digital platforms, mobile applications, artificial intelligence-driven language tools, and virtual classrooms (Ansari, 2020). The technologies facilitate self-paced learning, real-time feedback, and heightened engagement while overcoming the constraints of traditional classroom environments and adapting to different learning styles. Additionally, the trend toward online tertiary education, driven by global factors such as the COVID-19 pandemic, has both exposed the benefits and limitations of technology-based language teaching (Liu, 2021).

This research aims at exploring the effects that technology has on English language learning in online tertiary education, including its effectiveness in improving linguistic proficiency, engagement, and autonomy of the learners (Martin, 2020). It also postures the potential challenges such as gaps in digital literacy, lack of interaction, and inaccessibility, which may hinder the learning experience (Ouyang, 2022). This study aims to provide insights into how technology can be optimally leveraged to improve English language learning outcomes in higher education by evaluating current trends, pedagogical approaches, and student experiences.

1.1.ROLE OF TECHNOLOGY IN ENGLISH LANGUAGE LEARNING

The advancement of technology has integrated itself into the learning process of the English language, thereby revolutionizing the traditional methods of teaching and further improving the entire learning experience (Rojabi, 2020). Digital platforms, multimedia resources, and artificial intelligence-driven tools make language learning engaging, interactive, and accessible to learners around the world (Bond, 2021). Online learning environments offer students various digital tools like language learning applications, virtual classrooms, and gamified platforms to support self-paced learning, instant feedback, and personalized instruction (Scherer, 2021). Moreover, the use of artificial intelligence-based tools such as chatbots, speech recognition software, and machine translation applications allows students to enhance pronunciation, grammar, and vocabulary through real-time corrections (Wang, 2020). Video conferencing platforms and online discussion forums encourage collaborative learning with students being enabled to participate in meaningful discussions, debates, and peer-to-peer interactions that imitate real life (Winaldo, 2022). In addition, cloud resources, e-books, and assessment tools guarantee students'

continuous availability of study material without any hindrance from geographic barriers. This has integrated virtual reality (VR) and augmented reality (AR) in language education to provide even more immersive learning experiences that enable students to practice their use of English in simulated real-life situations (Doo). Technology's role in the learning of the English language also comes with its own challenges, including digital literacy, potential distractions, and a possible decrease in face-to-face interaction. However, when used appropriately, technology does not only promote linguistic competence but also learner autonomy, motivation, and engagement. It is an essential part of modern English language education.

1.2.OPPORTUNITIES AND CHALLENGES IN ONLINE TERTIARY EDUCATION

The face of higher education has dramatically been changed by the advent of tertiary education online, with opportunities and challenges for the students, the institutions, and the educators (Zhang, 2022). This change was brought about by the rapid changes in digital technology, which also redefined how learning occurs within higher education globally. Let us discuss the opportunities and challenges (Zheng, 2020; Crystal, 2018).



Figure 1: Online tertiary education

Opportunities in Online Tertiary Education

1. **Access and Flexibility:** One of the main advantages of online education is its accessibility. It makes tertiary quality education available to learners from different parts of the world, irrespective of their socio-economic background. Online makes it possible for learners to access courses without having to relocate or observe inflexible schedules as they do at their own pace. This flexibility has many benefits towards the working profession and those bound with family matters. They get enough time in managing their academics.

2. **Cost-Effectiveness:** Online learning tends to be less expensive compared to face-to-face learning in physical classrooms. With lower overhead costs- infrastructure, spaces, and transportation- institutional costs are relatively low, and therefore, so are the costs of their tuition. Additionally, travel and accommodation costs are saved because the students do not have to go to a campus to learn.
3. **Diverse Course Offerings:** Online tertiary education provides access to a wide variety of courses that may not be offered locally or through more traditional institutions. The courses range from a larger availability of courses in disciplines that include niche areas of study to specialization or certification in courses other than a degree program. Such diversified learning stimulates life-long learning and know associated with knowledge other than the conventional degree program in university.
4. **Innovative Learning Methods:** Online learning promotes the application of innovative digital tools and technologies that improve learning. Examples of such technological advancements include virtual classrooms, interactive video lectures, online discussion forums, multimedia content, and gamified assessments. All these technological innovations are capable of creating a more personalized experience in learning. This is because they allow learners to learn according to their individual styles.
5. **Global Collaboration and Networking:** It facilitates international collaboration in the online arena. Students working from different corners of the globe can collaborate, share ideas, and gain diverse insights from global perspectives. The global community experience they get to share will only improve their learning process and add value to the professional network for their future.

Challenges in Online Tertiary Education

1. **Lack of Face-to-Face Interaction:** The biggest disadvantage in the flexibility and accessibility online education is its lack of human interaction. Face-to-face discussion, nonverbal communication, and instant feedback from instructors are limited. Students cannot develop interpersonal skills, and sometimes it may isolate them or make them feel detached.
2. **Digital Divide:** This will be a large barrier for the students in various regions as access to online learning is global. However, access to the same technology and an internet connection by all students would not be provided. This further creates inequities, specifically in low-income or rural settings, where availability of computers or high-speed internet is limited. Thus, due to these restrictions, students can face problems when accessing course material or participating in online classes.
3. **Self-Discipline and Motivation:** An individual must have considerable self-discipline, motivation, and time management skills when doing online learning because it lacks structure as found in a traditional classroom setting. Many students, while doing their own learning at home, get into trouble for failure to focus in their studies and, at the same time, get easily diverted by things or people around.

4. **Quality Assurance and Accreditation:** With the increase in online education, the quality and authenticity of some of the online courses have been questioned. Many legitimate institutions offer online courses and degrees, but there are also thousands of unaccredited programs that do not live up to the set academic standards. Students must be careful and research the legitimacy of the programs to avoid wasting time and money on substandard education.
5. **Technological Barriers and Support:** While digital technologies allow for the experience of online education, technical problems can impede the effectiveness of the learning process. Technical issues, software incompatibility, and problems associated with the use of digital tools can disrupt learning. In addition, institutions should provide strong technical support to overcome these problems to ensure that learning is not hindered.

1.3.OBJECTIVES OF THE STUDY

- To analyze the relationship of computer self-efficacy, perceived usefulness, perceived ease of use, attitude, and behavioral intention towards the adoption of online applications for language learning at the tertiary level.
- To analyze demographic factors, such as gender, in relation to the perceptions and acceptance of students towards technology-enhanced English language learning.
- To evaluate, using the above statistical tools like Cronbach's alpha, Pearson's correlation coefficient, and structural equation modeling, the reliability and validity of the proposed research model.

1.4.HYPOTHESIS OF THE STUDY

Hypothesis 1: Computer Self-Efficacy will significantly and positively impact the students general attitude towards computer use.

Hypothesis 2: The perceived usefulness use will have a positive and significant impact on students' attitude towards using computers.

Hypothesis 3: Perceived ease of use will positively and significantly affect students perceived usefulness.

Hypothesis 4: Perceived ease of use will have a positive and significant impact on the attitude of students towards the computer use.

Hypothesis 5: The gender of the students will significantly and positively influence the students' acceptance towards using Online applications in language learning

Hypothesis 6: The students' experience will highly and positively affect students' willingness to utilize Online applications for language learning

2. LITERATURE REVIEW

Shadiev and Yang (2020) studied of technology-enhanced language learning reviewed the role of digital tools, such as AI and virtual reality, and mobile applications, in order to discuss the benefits of personalization and instant responses, access to linguistic resources, and more. At the same time, they point out some digital divide gaps, technical issues, and difficulties that require pedagogical strategy. The review strengthens the role of the instructor in optimizing the use of technology for language teaching. Ultimately, the study suggested that although technology improved learning outcomes, its effectiveness depended on proper implementation and instructional design (Shadiev R. &, 2020).

Lamb and Arisandy (2020) looked at the impact of online use of English on the motivation of language learners. The study probed how the engagement of learners in digital platforms, such as social media, online gaming, and internet browsing, affected the interest and desire to learn the English language. It was determined that frequent exposure to English through online environments boosted intrinsic motivation to learn the language. However, it also indicated that motivational levels could vary depending on students' proficiency and personal attitudes toward technology. In the end, the research indicated that although online English use had a positive effect on motivation, its effectiveness was learner experience and learning context dependent (Lamb, 2020).

Bin-Hady et al. (2023) explored the role of ChatGPT in the learning of the English language, taking a global perspective, to analyze its potential benefits and challenges. Their study showed how it facilitated language acquisition through instant feedback, improvement in writing skills, and support for personalized learning experiences. Learners benefited from interactive conversations, improved grammar accuracy, and expanded vocabulary. However, in this study, challenges were outlined as overdependency on AI for solutions, lack of ethics while applying AI technology, and reliance on critical thinking while learning to speak the new language. As a result, the research proved that although helpful, ChatGPT was highly effective only through guided implementation in a balanced form (Bin-Hady, 2023).

Anthony et al. (2019) investigated the role of blended learning in improving teaching and learning effectiveness in higher education institutions. The empirical study showed that the use of blended learning, where face-to-face instruction is integrated with online learning elements, enhanced student engagement, academic performance, and overall satisfaction. The findings were that the blended learning method allowed students to learn at their own pace but with the benefit of in-person interaction. The study also made it clear how effective instructional design and the utilization of appropriate technology tools can lead to the ultimate exploitation of potential in blended learning environments. As such, with the positive aspects, there still existed challenges about the need for adequate training resources for instructors (Anthony, 2019).

3. RESEARCH METHODOLOGY

This is a study where the relation with computer self-efficacy to perceived usefulness and perceived ease of use with regards to attitude in the online learning of languages that is conducted online at tertiary learning institutions and an analysis of adoption behavior through both the behavioural aspect and attitude during the research.

3.1. Research Design

The study is of a quantitative nature and follows a correlational research design to explore the relationships among different constructs and their effects on the adoption of technology for language learning. The descriptive method has been used in the description of the demographic profile of the participants, and inferential statistics were applied to test the hypotheses on the impact of the different variables on students' perceptions and acceptance of online language learning applications.

3.2. Sample Selection

The target population is tertiary-level students who have enrolled in online language learning courses. The sample is stratified by gender so that there are equal numbers of male and female students. There are 150 participants in total, 75 males and 75 females. The participants are selected using convenience sampling from several institutions offering language courses. Additional demographic data, including experience with technology and online learning, will be collected to analyze the effect of experience on technology adoption.

3.3. Data Collection

The data in this study are collected using a structured approach to measure key constructs related to the use of online language learning applications. Computer self-efficacy is measured in order to ascertain participants' level of confidence with regard to using computers for the purpose of accomplishing language learning tasks. Perceived usefulness is the belief held by participants with regard to the utility of the applications, while perceived ease of use measures the degree to which participants find the technology simple and user-friendly. The study further analyzes the participants' attitudes towards using technology for language learning by ascertaining whether their attitudes are positive or negative. This also measures their behavioral intention and their likelihood of continuing to use online language learning applications in the future. The last demographic data gathered includes gender and experience level to facilitate the correlation analysis for a deeper insight into the study's findings.

3.4. Statistical Tools and Techniques

Various statistical tools and techniques are used to scrutinize the collected data in order to analyze its accuracy, and to rightly present the findings. Descriptive statistics are applied in order to present a summary of demographic information by summarizing gender distribution and experience levels and presenting frequencies and percentages to clearly allow for the characteristics of the sample being apprehended. The reliability of the measuring scale is assessed by computing Cronbach's Alpha. Computer self-efficacy, perceived usefulness, attitude, and behavioral intention are all measured by items that must be statistically sound and show internal consistency. To find out how the various variables are related to each other, we utilize Pearson's correlation coefficient. Here, it will be utilized to ascertain the relationship between attitudes, behavioral intentions, computer self-efficacy, perceived utility, perceived ease of use, gender, and experience level. In doing so, we may better see how the many components of the research are related to one another and how they depend on one another. We can learn more about the predictive capabilities of each construct on technological adoption and verify our hypotheses using regression analysis. This helps us understand which aspects have a greater impact on users' readiness to adapt to online language learning programs. By simulating both direct and indirect effects, Structural Equation Modeling verifies the constructs' interrelationships and, ultimately, the study model. Using structural equation modeling (SEM), researchers may test hypotheses on the effects of self-efficacy on behavioral intention, perceived utility and ease of use on attitudes, and the moderating role of demographic variables like gender and experience on technology acceptance. All of these statistical techniques offer a sound foundation for the analysis of data and meaningful conclusion of the online language learning applications' adoption.

4. DATA ANALYSIS AND INTERPRETATION

Table 1: Demographic background of Study Participants

Category	Subcategory	Number	Percentage (%)
Gender	Male	75	50%
	Female	75	50%
Experience	Fair	22.5	15%
	Good	60	40%
	Very Good	52.5	35%
	Excellent	15	10%

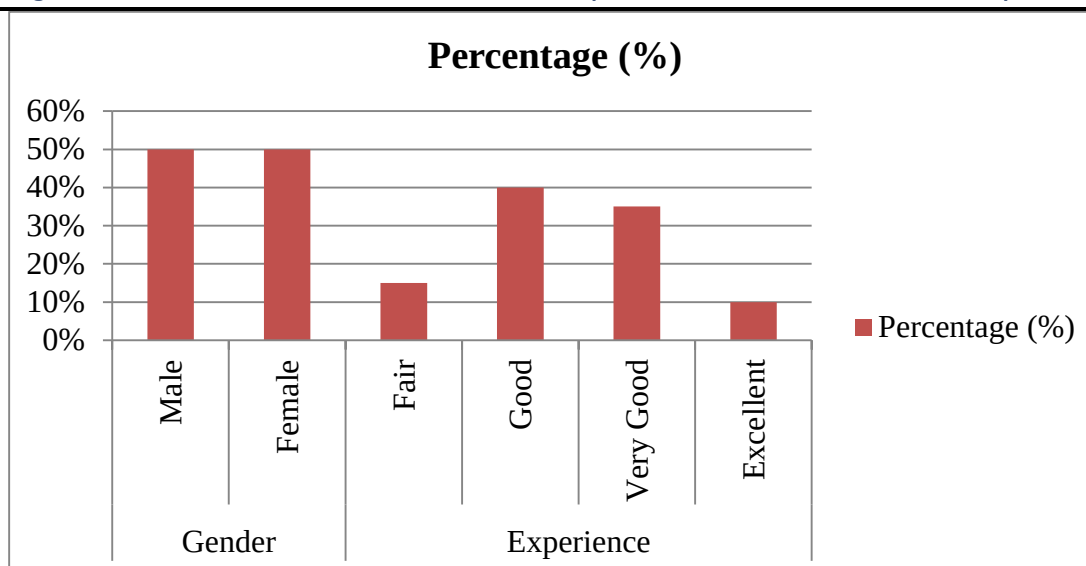


Figure 2: Graphical Representation of Demographic background of Study Participants

Table 1 depicts the demographic background of the participants in the study. There is a balanced gender distribution as there are 50% males and 50% females, comprising 75 males and 75 females, respectively. This distribution may imply that the sample is diverse in terms of gender and will, therefore, give a balanced perspective of the objectives of the study. With respect to experience, respondents were classified into four categories, namely, Fair, Good, Very Good, and Excellent. In this category, 15% (22.5) reported fair level of experience which implies a low proportion of the respondents having experience. Most of the respondents, 40% (60 individuals), felt that they were well experienced. This indicated that a good proportion of the respondents were moderately experienced or knowledgeable about the topic in general. Additionally, 35% (52.5 individuals) of the respondents gave their experience a very good rating, showing a substantial proportion of the respondents were more advanced in terms of their experience level. Finally, 10% (15 individuals) stated they had the best level of experience, indicating that only a few participants have extremely developed knowledge or competence in the subject matter. This spread of experience levels thus ensures all participants, from less-experienced persons to those experienced ones, might indeed yield varied insights or findings in the study. It also shows that the participants of the study are likely to have different views on the topic under investigation, which will add to a more comprehensive analysis.

Here's the table based on the given data for Cronbach's alpha:

Table 2: Cronbach's Alpha

Cronbach's Alpha	Items
0.480	24

For 24 items in the research, Cronbach's Alpha is 0.480, as shown in Table 2. The degree to which elements in a set are connected to one another is measured by Cronbach's Alpha, which is also known as internal consistency. The scale appears to be relatively low-quality, with an internal consistency rating of

0.480. When Cronbach's Alpha is over 0.7, it shows strong dependability; when it drops below 0.6, it becomes troublesome; the exact threshold is context dependent. However, for this instance, with the value being 0.480, it indicates that the items are not particularly interrelated, and there could be potential concerns over the reliability of measurement tool used. This would mean, therefore, that possibly, further refinement or revision of the items should be made to ensure that better internal consistency and reliability across future studies can be achieved.

Here's a properly formatted table based on the data you provided:

Table 3: Correlation between the constructs

Construct	Computer Self-efficacy	PU	Actual Use	PEU	Attitude	Behavioral Intention
Computer Self-efficacy	1	.478**	.280*	.310**	.485**	.520**
		(.020)	(.020)	(.004)	(.000)	(.022)
		150	150	150	150	150
PU	.478**	1	.530**	.680**	.820**	.845*
	(.020)		(.002)	(.015)	(.002)	(.001)
	150	150	150	150	150	150
Actual Use	.280*	.530**	1	.280*	.380**	.455**
	(.020)	(.002)		(.020)	(.001)	(.000)
	150	150	150	150	150	150
PEU	.310**	.680**	.280*	1	.540**	.440**
	(.004)	(.015)	(.020)		(.002)	(.000)
	150	150	150	150	150	150
Attitude	.485**	.820**	.380**	.540**	1	.830**
	(.000)	(.002)	(.001)	(.002)		(.001)
	150	150	150	150	150	150
Behavioral Intention	.520**	.845*	.455**	.640**	.830**	1
	(.022)	(.001)	(.000)	(.000)	(.001)	
	150	150	150	150	150	150

There is a strong link for all variables in Table 3, which illustrates the interconstructs correlations of Computer Self-efficacy, PU, Actual Use, PEU, Attitude, and Behavioral Intention. Attitude (0.485), Behavioral Intention (0.520), Computer Self-Efficacy (0.478), and PEU (0.310) were all positively correlated. It indicates that individuals with a higher computer self-efficacy have more positive attitudes, a stronger intention to use technology, and perceive it as useful and easy to use. The correlation between

self-efficacy and real technology use is modest, with a weak but significant link with actual use (0.280). Attitude (0.820) and Behavioral Intention (0.845) were substantially linked with PU. The results showed that people's attitudes and willingness to use technology are affected by their perceptions of its utility. PEU correlation with PU at a strong magnitude was also.680 as an indication of that when perceived by users, usefulness technology can make it seem more user-friendly to them. Although a weaker correlation existed with the remaining constructs, actual use was correlated positively with both Attitude 0.380 and Behavioral Intention 0.455, indicating that actual usage was still related to attitudes and intentions to use a technology in the future. High correlations between PEU and attitude 0.540 as well as BI 0.640 were found, pointing out that once users find technology easy to use, they more likely develop good attitudes and also stronger intentions about using it repeatedly. Conclusion: The data suggests that usefulness, ease of use, and self-efficacy are the main factors in users' attitudes and behavioral intentions toward technology, and perceived usefulness and ease of use are the major drivers of future engagement with the technology.

Table 4: Results of Correlation between other variables and gender

Gender of the Participants	Computer Efficacy – .346**	Perceived Use – .299**	Actual use – .174	Ease of Use – .124	Attitude – .260*	Behavioral intention – .165
	0.01	0.08	.132	.276	.021	.149
	73	73	73	73	73	73

Table 4. The correlation between many variables with gender. From the findings in the table, it is evident that gender has a significant association positively with Computer Self-efficacy at correlation coefficient $r = -0.346^{**}$, $p = 0.01$, meaning gender differences affect the self-confidence of a person to operate computers, though the minus sign points out that males are better than females concerning computer self-efficacy. A similar highly positive correlation was found with Perceived Usefulness ($r = -0.299^{**}$, $p = 0.08$), indicating that gender influences what people perceive as useful in the technology, with males having a marginally higher perception of usefulness. However, Actual Use ($r = -0.174$, $p = 0.132$), Ease of Use ($r = -0.124$, $p = 0.276$), and Behavioural Intention ($r = -0.165$, $p = 0.149$) have weak, non-significant correlations with gender, which means that no significant gender-based differences exist in the frequency of actual technology use, ease of use perceptions, or behavioural intentions. There is a mild negative correlation in gender and attitude ($r = -0.260^{*}$, $p = 0.021$); that is, males might possess more positive attitudes toward the adoption of technology relative to females. In conclusion, while gender heavily influences computer efficacy, perceived usefulness, and attitude toward technology, it has only a weaker relationship with actual usage, ease of use, and behavioural intention.

Table 5: Correlation between other variables and students experience of computer use

List of Variable	Computer self-efficacy	Perceived Use	Actual use	Ease of Us	Attitude	Behavior Intention
Experience of computer	.99	.254	.99	.344	.330	.309
	.391	.23	.387	0.001	0.03	0.06
	73	73	73	73	73	73

Table 5, it is revealed that the experience of students on various parameters and their practice with computers. There is a positive association in the case of experience toward Computer Self-Efficacy, which is shown as ($r = 0.99$, $p = 0.391$) indicating high experience with computers as associated with more robust confidence toward using computers. It suggests that more exposure to computers among students leads to more belief in their effective use. There was a moderate positive correlation with experience and Perceived Usefulness ($r = 0.254$, $p = 0.23$), indicating that students with more experience perceive technology to be slightly useful. Strengthening the relationship further was its correlation with Actual Use ($r = 0.99$, $p = 0.387$), thus indicating that experienced students use computers the most. Experience also has a moderate correlation with Ease of Use, $r = 0.344$, $p = 0.001$ and Attitude, $r = 0.330$, $p = 0.03$, showing that students who have more experience are likely to find computers easier to use and hold more positive attitudes toward using computers. However, the relationship of experience with Behavioral Intention is weaker and insignificant statistically ($r = 0.309$, $p = 0.06$), where experience does not have a strong influence on the intention of students to use computers. Overall, the outcome of the study indicates that experience positively and influences computers about self-efficacy, usefulness, actual usage, ease of use, and attitude with self-efficacy and actual usage appearing as strongest relationships.

5. CONCLUSION

This study showcased how technology is transformative in the teaching of the English language, emphasizing its potential in enhancing learner engagement, proficiency in linguistic skills, and learning autonomy in online tertiary education. Perceived usefulness, attitude, computer self-efficacy, and convenience of use were said to impact students' behavioural intention to participate with technology-driven language learning apps. The outcomes suggest that perceived usefulness is significantly related to students' attitudes towards online learning, and gender is a critical factor in technology acceptance, while earlier experience is another. Still, technology-based learning has several disadvantages such as digital illiteracy discrepancies, accessibility barriers, and decreased face-to-face communication. However, the paper is pointing towards proper pedagogical strategies to make proper use of digital tools to bridge this gap. The future focus of educators and policymakers should be on the development of inclusive and adaptive learning frameworks that guarantee equal access, foster motivation, and enhance the learning

experience. Long-term learning outcomes and the effectiveness of emerging technologies such as virtual reality, artificial intelligence, and gamification in language acquisition are areas to be explored in future research. The technological platforms can be better exploited to introduce active, interactive, and personalized English language learning environments within higher education by recognizing and addressing the aforementioned challenges.

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