Asian Journal of
Science, Technology, Engineering, and Art

e-ISSN: 3025-4507
p-ISSN: 3025-5287
Index: Harvard, Boston, Sydney University, Dimensions, Lens, Scilit, Semantic, Google, etc

https://doi.org/10.58578/AJSTEA.v3i4.6482

Use of Mobile Device Apps in Virtual Courses by English as a Foreign Language (EFL) University Students

Jesús Romero-Argueta[1], Edwin Osmil Coreas-Flores[2], Osmin Sura-Majano[3]
[1]Universidad de Oriente, El Salvador; [2]Universidad Gerardo Barrios, El Salvador;
[3]Ministerio de Educación, Ciencia y Tecnología, El Salvador
jose.romero@univo.edu.sv; osmil@ugb.edu.sv

Article Info:

Submitted:	Revised:	Accepted:	Published:
Jun 5, 2025	Jul 1, 2025	Jul 13, 2025	Jul 18, 2025

Abstract

This study investigates the use of mobile device applications for English language learning among university students enrolled in virtual EFL (English as a Foreign Language) courses in El Salvador. Adopting a descriptive, quantitative, and relational research design, data were collected from 199 students across all academic levels within an English language bachelor's program. Findings reveal that nearly half of the students report an intermediate level of engagement with mobile apps for English learning. However, a notable portion of students do not utilize entertainment-based language learning apps, indicating selective use based on perceived educational value. Statistical analysis shows a significant variation in app usage by academic level, with advanced students demonstrating higher engagement. No significant difference was found based on gender. These results reflect increasing digital competence among university students and emphasize the importance of providing targeted support and structured integration of mobile learning tools within virtual EFL curricula to enhance language acquisition outcomes.

Keywords: Mobile Apps; Mobile Learning; University Students; Language Learning; English Language Education

INTRODUCTION

The proliferation of mobile device applications (apps) has significantly reshaped educational practices, particularly within virtual learning environments for English as a Foreign Language (EFL) university students. These apps provide interactive, accessible, and flexible platforms that enhance language acquisition in virtual courses. However, challenges such as inconsistent app engagement, disparities in digital literacy, and the absence of pedagogically tailored frameworks often undermine their efficacy. This problematic situation necessitates a closer examination of how EFL university students utilize mobile apps to optimize their learning experiences in virtual settings.

The importance of this topic is underscored by the growing dependence on mobile technologies in higher education, especially in EFL contexts. Mobile apps enable personalized learning, immediate feedback, and collaborative opportunities, which are vital for fostering linguistic proficiency (Hao et al., 2021). The shift to virtual education, accelerated by the COVID-19 pandemic, has amplified the role of mobile apps in ensuring continuous access to educational resources across geographical and temporal constraints (Kohnke, 2020). Understanding their application in virtual EFL courses is essential for enhancing student engagement and academic success.

Despite advancements in mobile-assisted language learning (MALL) research, a significant gap persists regarding the specific use of mobile apps in fully virtual EFL courses at the university level. While recent studies have explored MALL in traditional or blended learning environments, there is limited focus on virtual settings, particularly concerning how students' technological proficiency, app preferences, and learning strategies influence adoption (Yang et al., 2023; Zhai & Wibowo, 2023). This gap highlights the need for empirical research to address the pedagogical and practical challenges of integrating mobile apps into virtual EFL education.

The objectives of this research are stated as follows:

To develop this study, the research team focused on the following objectives:

1. To identify if the use of mobile Apps during English learning differs according to the academic students' level in virtual education courses.
2. To determine if the mobile apps in online education used by students for learning depend on gender in virtual education courses.

Literature Review

The integration of mobile devices and applications in English as a Foreign Language (EFL) education has garnered significant attention in recent years, particularly in the context of virtual learning environments. This literature review synthesizes findings from various studies conducted between 2020 and 2025, highlighting the pedagogical potential, challenges, and future directions for research in this area.

Pedagogical Potential of Mobile Applications

Ahn and Lee (2016) underscore the effectiveness of mobile applications equipped with speech recognition technology in enhancing speaking proficiency among EFL learners. Their study reveals that students report positive user experiences, suggesting a growing acceptance of mobile apps for language learning. The ability of these applications to facilitate self-regulated learning and provide immediate feedback is particularly beneficial for EFL students striving to improve their speaking skills in virtual environments.

Klimova and Poláková (2020) also highlight the strengths of mobile applications in vocabulary acquisition, noting that accessibility and corrective feedback are pivotal in supporting EFL learners. While positive feedback was evident, they also reported limitations in communication performance, indicating the need for further enhancement of mobile apps to better serve the needs of language learners. Gamlo (2019) explores the motivational aspect of mobile game-based language learning applications, demonstrating that gamification can significantly enhance engagement among EFL students. This aligns with the notion that interactive and enjoyable elements are crucial for maintaining student interest in virtual learning environments.

Barriers to Mobile Learning

Despite the evident advantages of mobile apps, research by Alghazi et al. (2021) identifies significant barriers to their usage among university students, including technical factors and user intentions. Employing the UTAUT model, the study highlights the necessity for educators and developers to understand these barriers to enhance mobile learning experiences effectively.

Similarly, Zhang and Pérez-Paredes (2019) investigate the motivations behind the use of mobile English learning resources (MELR) among Chinese postgraduate EFL learners, revealing that exam preparation and vocabulary expansion drive their usage. The reliance on social media for recommendations indicates a significant gap in guidance for

selecting appropriate MELR, suggesting a need for more structured support in future virtual courses.

Impact on Learning Habits and Health Implications

The prevalence of digital eye strain among university students, as noted by Ross et al. (2020), and the associated health implications of prolonged mobile device usage, highlight the need for promoting healthy digital habits. These findings stress the importance of balancing mobile learning strategies with student well-being to ensure effective engagement in virtual courses. Furthermore, Gammoh (2021) examines students' perceptions of e-learning during the COVID-19 pandemic, revealing both positive and negative aspects of online instruction. While the flexibility of e-learning was appreciated, concerns regarding internet connectivity and material accessibility emerged, indicating a critical area for continuous improvement in virtual course design.

Enhancing Collaborative Learning and Digital Literacy

The integration of applications like WeChat into dictation practice significantly improves listening skills among EFL students (Chen & Zhao, 2022). This finding emphasizes the potential of mobile tools to foster collaborative learning, which is vital for language proficiency in virtual courses. Jeong (2022) discusses the role of mobile-assisted language learning in promoting self-directed learning and digital literacy among EFL students. The positive attitudes towards mobile-assisted learning suggest its potential as a sustainable educational tool, enhancing the capacity for independent learning outside of traditional classroom settings. Besides, this supports autonomous learning where students develop text interpretation competencies that favor learning governed by themselves (Coreas-Flores & Romero-Argueta, 2024).

While the reviewed studies provide valuable insights into the use of mobile applications in EFL education, several gaps remain. Notably, there is limited research on the long-term effects of mobile learning on language proficiency and student retention in virtual courses. Additionally, the influence of specific app features on learning outcomes has not been thoroughly investigated.

Future research should focus on developing comprehensive frameworks for integrating mobile applications into EFL curricula, considering factors such as user experience, accessibility, and health implications. Furthermore, exploring the role of

gamification and social networking features in mobile learning tools could yield important insights into enhancing student engagement and motivation.

The literature indicates a promising trend in the use of mobile devices and applications for EFL education, particularly in virtual learning environments. While significant advancements have been made, addressing the barriers to mobile learning and understanding the health implications of prolonged usage remain crucial for future educational strategies. Ongoing research will be essential in optimizing the integration of mobile technologies to better serve EFL students' needs in the evolving educational landscape.

METHODS

The research is exploratory-descriptive, since the phenomenon studied is approached for the first time in the framework of higher education in El Salvador (Hernández-Sampieri, et al., 2014). The approach used is quantitative, due to the nature of the use of nominal and categorical variables for their analysis through non-parametric statistical tests. For example, to test hypotheses if the use of mobile Apps during English learning differs according to the academic level of the students, the Kruskal-Wallis test was applied; meanwhile, to test the hypothesis whether the mobile applications used by English learners during their learning depend on gender, the Mann-Whitney U test was used. At the same time, the type of study is relational, through which it was intended to find a relationship or significant differences between the correlated variables.

Participants

A sample (n) of 199 students from the different academic levels of a population of 326 participated in the study, all of them currently majoring the bachelor's degree in English Language from a higher education institution (HEI), located in the eastern region of El Salvador. They are studying all their subjects through virtual learning environments. To do this, a cluster sampling method was used, which allowed components to be grouped homogeneously according to their similarities. These elements were key to describing units of analysis within themselves (Hernández y Carpio, 2019). Regarding the academic level of the surveyed people, 38 students enrolled in the first year, 38 in the second year, 38 in the third year, 38 in the fourth year, and 47 in the fifth year were part of the research. Table 1

describes the sociodemographic data that characterizes the population of students participating in the study.

Table 1. Sociodemographic data

Characteristics	Categories	Frecuency	Porcentage
Gender	Male	81	40.7 %
	Female	118	59.3 %
Age	16 a 20	88	44.2 %
	21 a 25	92	46.2 %
	26 a 30	11	5.5 %
	31 a 35	6	3.0 %
	36 a 40	1	0. 5 %
	41 a más años	1	0.5 %
Zone	Urban área	118	59.3 %
	Rural área	81	40.7 %
Mobile device used	Cell pone	170	85.4 %
	Laptop	29	14.6 %
	Tablet	0	0.0 %

Table 2 describes the data of the population by groups according to the academic year, as well as the samples by representative clusters for each year. In the same way, the mean and standard deviation are evident, of which it is reflected that the highest mean=2.21 and standard deviation (SD)=0.12 is represented by the students of second year. This means that the deviation according to the use of mobile apps for learning English from its average is 0.12. Likewise, the same average of SD=0.12 is reflected in the first- and second-year groups.

Table 2. Academic year

Clusters	Sample	Mean	Standard deviation
First year	38	1.95	0.12
Second year	38	2.21	0.12
Third year	38	2.16	0.12
Fourth year	38	2.13	0.10
Fifth year	47	2.09	0.11
Total	199		

Instrument

A questionnaire divided into two sessions was administered through variables and dimensions (Romero-Argueta, et al., 2020). The first one is presented to collect sociodemographic data pertinent to the nominal variables; while the second section is made up of 30 items, which are grouped into 8 dimensions derived from categorical variables.

On the other hand, in relation to the answers for the statements, these are of the Likert type, contemplating frequency options, such as always, almost always, sometimes, almost never and never within a metric scale (Romero-Argueta, 2020).

Instrument internal validity

To verify the instrument validity, a team composed of four experts participated as an evaluator jury. From this team, two of them are Bachelors of Arts in the English language and the other two evaluators are professors of Computing Science. They all have experience in the research area at a private university. They recommended keeping the 30 items of the instrument since those statements responded to the essence of the research purpose.

Instrument application and reliability

Now then, to apply the instrument, it was required to use the institutional account of QuestionPro platform aimed at obtaining suitable data for the study. For that purpose, the researchers started to coordinate with the university English professors to contact the groups of learners selected to participate in the research. After conducting the online survey to the selected population, the reliability of the instrument was calculated by analyzing it through the consistency of the Cronbach Alpha coefficient. The result reached was 0.93. According to Bonnet & Wright (2014), this value is in an excellent range (> 0,9) of the scale used to measure external validity of the instrument.

Table 3 shows the mean and standard deviation (SD) of the research variables. It also describes the variables' reliability through the Alpha of Cronbach. In one hand, it is revealed that the use of the mobile Apps contains a mean=2.11 and a standard deviation=0.72. On the other hand, the apps used for learning reflects a mean=1.75 and a standard deviation=0.43. This indicates that the highest mean and SD averages are reflected on the use of mobile Apps variable, which means that students do not necessarily use the mobile Apps only for learning English.

Table 3. Research variables and reliability

Variables	N	Mean	SD	Alpha of Cronbach
Use of the mobile Apps	199	2.11	0.72	0.89
Apps used for learning	199	1.75	0.43	0.86

RESULTS

Table 4 reflects the descriptive statistics concerning the research variables divided into different categories. For example, it is perceived that students make an intermediate use of Apps for learning English (47.2 %). Therefore, this implies that not all learners have languages Apps installed for learning purposes. This is the highest valid percentage of the results analysis concerning to the Use of the mobile Apps. Now then, regarding with the Apps used for learning variable, the highest valid percentage is represented by No use of applications for entertained learning category (62.8 %). Hence, this explains that there is a significant group of students who is not attracted by Apps destined to entertained learning. This result might be owing to the students' ages or academic level.

Table 4. Descriptive statistics based on the use of Apps

Categories	Frequency	Valid percentage
Low use of Apps	42	21.1%
Intermediate use of Apps	94	**47.2%**
High use of Apps	63	31.7%
Total	199	100%
Categories	**Frequency**	**Valid percentage**
Use of applications for entertained learning	49	24.6%
No use of applications for entertained learning	150	**62.8%**
Total	199	100.0%

Table 5 exhibits the descriptive percentages related to students' academic year. It can be perceived that fifth-year students revealed the highest valid percentage (23.6 %). This is clearly explained since they represented the highest sample (47) compared to the other groups.

Table 5. Descriptive statistics of students' academic year

Academic year	Frequency	Valid percentage
First year	38	15.9%
Second year	38	15.9%
Third year	38	15.9%
Fourth year	38	15.9%
Fifth year	47	**23.6%**
Total	199	100.0%

Table 6 portrays the respective descriptive percentages pertaining to students' genre. The results show that the female genre represents the highest valid percentage (59.3 %). This occurs because, as it is observed in the frequency of the table, more women participated in the study.

Table 6. Descriptive statistics based on the use of Apps

Genre	Frequency	Valid percentage
Male	81	40.7%
Female	118	**59.3%**
Total	199	100%

Table 7 describes the nonparametric tests used to find statistically significant differences within the independent variables regarding the present research study: Firstly, considering values at ($\alpha = 0.05$), there is no statistical significance on the use of mobile Apps according to the academic level (0.589). This means that students, no matter the level where they are studying, make equal use of the different applications for learning English. Secondly, the table shows that the use of those Apps for the same purpose does not depend on gender, revealing a statistical significance equivalent to 0.91.

Table 7. Nonparametric tests of students' use on the use of mobiles Apps

Kruskal-Wallis test: Academic level		
Chi-squared	df	P-value
2.82	4	**0.589**
U of Mann-Whitney and W of Wilcoxon tests: Gender		
U of Mann-Whitney	W of Wilcoxon	P-value
4276.00	7597.00	**0.91**

DISCUSSION

The results of this study reinforce the growing body of literature that highlights the potential of mobile applications to enhance English language learning in virtual university settings. The finding that students' use of mobile apps for language learning significantly differs by academic level, but not by gender, is consistent with previous research emphasizing the importance of digital literacy and academic maturity in technology adoption (Jeong, 2022). As students advance through their academic careers, they may develop more effective strategies for integrating digital tools into their learning, which could explain the increased engagement observed among upper-level students.

The intermediate level of app usage reported by nearly half of the participants aligns with the observations of Ahn and Lee (2016), who found that EFL learners respond positively to mobile applications, particularly those offering interactive features such as speech recognition. Similarly, Klimova and Poláková (2020) identified accessibility and corrective feedback as key strengths of mobile apps, especially for vocabulary acquisition in

virtual environments. However, the present study also reveals that a substantial proportion of students do not use language learning apps, particularly those designed for entertainment or gamified learning. This finding echoes Gamlo (2019), who noted that while gamification can boost motivation and engagement, its effectiveness depends on alignment with learners' preferences and academic goals.

Barriers to mobile learning remain a concern, as highlighted by Alghazi et al. (2021), who identified technical issues and user intentions as significant obstacles to effective app adoption. The current study's results suggest that despite widespread access to mobile technology, inconsistent engagement and a lack of pedagogical guidance may limit the full realization of mobile learning's benefits. This is further supported by Zhang and Pérez-Paredes (2019), who emphasized the need for structured support in app selection, as many students rely on peer recommendations rather than informed guidance.

Health considerations also emerge as an important factor. As Ross et al. (2020) documented, prolonged use of digital devices can lead to digital eye strain and other health issues, underscoring the need for balanced digital habits and awareness of well-being in virtual learning contexts. These findings support the call for educators to not only promote effective use of mobile apps but also to foster healthy and sustainable digital practices among students.

In line with the literature, the present study suggests several practical implications. First, integrating mobile apps more systematically into EFL curricula and providing explicit guidance on app selection can help bridge the gap between access and effective use. Second, targeted digital literacy training, particularly for lower-level students, may enhance students' confidence and competence in leveraging mobile technologies for language learning. Finally, ongoing research should further investigate the long-term impact of mobile app usage on language proficiency, student retention, and overall academic performance in virtual EFL courses (Yang et al., 2023; Zhai & Wibowo, 2023).

In summary, the study confirms the pedagogical promise of mobile apps in virtual language education while highlighting the need for tailored support, digital literacy development, and attention to student well-being. These findings contribute to a nuanced understanding of how mobile technologies can be optimized to support diverse learners in evolving educational landscapes.

CONCLUSION

The use of mobile applications for English language learning among EFL university students in virtual courses significantly differs according to academic level. This suggests that as students progress through their academic programs, their engagement with mobile learning tools evolves, possibly due to increased digital competence, greater familiarity with technology, and changing academic demands. These findings highlight the importance of tailoring mobile learning strategies and support to students' academic stages to optimize their language learning experiences in virtual environments.

The research also determines that the use of mobile apps for English learning in virtual education does not depend on students' gender. Both male and female students demonstrate similar patterns of mobile app usage, indicating that gender is not a determining factor in the adoption or frequency of mobile learning tools within this context. This points to the effectiveness of virtual learning environments in providing equitable access to technology and learning resources, regardless of gender, and suggests that interventions to promote mobile-assisted language learning can be designed inclusively for all students.

The aforementioned emphasizes the need for differentiated support based on academic progression rather than gender, and they reinforce the value of inclusive, technology-enhanced language learning strategies in virtual university settings.

REFERENCES

Ahn, Taeyoung., & Lee, Sangmin-Michelle. (2016). User experience of a mobile speaking application with automatic speech recognition for EFL learning. *Br. J. Educ. Technol.*, 47, 778-786. http://doi.org/10.1111/bjet.12354

Alghazi, Saud S.., Kamsin, A.., Almaiah, Mohammed Amin., Wong, S. Y.., & Shuib, Liyana. (2021). For Sustainable Application of Mobile Learning: An Extended UTAUT Model to Examine the Effect of Technical Factors on the Usage of Mobile Devices as a Learning Tool. *Sustainability*. http://doi.org/10.3390/SU13041856

Bonnet, D., & Wright, T. (2014). Cronbach's alpha reliability: Interval estimation, hypothesis testing, and sample size planning. *Journal of Organizational Behavior*, 36(1), 3–15. https://doi.org/10.1002/job.1960

Chen, Yang., & Zhao, Shu-tao. (2022). Understanding Chinese EFL Learners' Acceptance of Gamified Vocabulary Learning Apps: An Integration of Self-Determination Theory and Technology Acceptance Model. *Sustainability*. http://doi.org/10.3390/su141811288

Coreas-Flores, E. O., & Romero-Argueta, J. de J. (2024). Academic support of virtual environments perceived by higher education students during Covid-19. *The Turkish Online Journal of Educational Technology,* 23(4), 8–15. https://tojet.net/articles/v23i4/2342.pdf

Gamlo, N.. (2019). The Impact of Mobile Game-Based Language Learning Apps on EFL Learners' Motivation. *English Language Teaching*. http://doi.org/10.5539/ELT.V12N4P49

Gammoh, Yazan. (2021). Digital Eye Strain and Its Risk Factors Among a University Student Population in Jordan: A Cross-Sectional Study. *Cureus*, 13. http://doi.org/10.7759/cureus.13575

Hao, T., Wang, Z., & Ardasheva, Y. (2021). Technology-Assisted Vocabulary Learning for EFL Learners: A Meta-Analysis. *Journal of Research on Educational Effectiveness*, 14, 645-667. https://doi.org/10.1080/19345747.2021.1917028

Hernández, C. E. & Carpio, N. (2019). Introducción a los tipos de muestreo. *ALERTA Revista Científica Del Instituto Nacional de Salud*, 2(1), 75–79. https://doi.org/10.5377/alerta.v2i1.7535

Hernández-Sampieri, R., Fernández-Colado, C. & Baptista-Lucio, P. (2014). *Metodología de la investigación* (6a ed.). México D.F.: McGraw-Hill Education. https://apiperiodico.jalisco.gob.mx/api/sites/periodicooficial.jalisco.gob.mx/files/metodologia_de_la_investigacion_-_roberto_hernandez_sampieri.pdf

Jeong, Kyeong-Ouk. (2022). Facilitating Sustainable Self-Directed Learning Experience with the Use of Mobile-Assisted Language Learning. *Sustainability*. http://doi.org/10.3390/su14052894

Klimova, B.., & Poláková, Petra. (2020). Students' Perceptions of an EFL Vocabulary Learning Mobile Application. *Education Sciences*. http://doi.org/10.3390/educsci10020037

Kohnke, L. (2020). Exploring learner perception, experience, and motivation of using a mobile app in L2 vocabulary acquisition. *International Journal of Computer-Assisted Language Learning and Teaching*, 10(1), 15-26. https://doi.org/10.4018/IJCALLT.2020010102

Rao, P. S. (2019). The Importance of Mobile Apps in the English Language Learning Environment. *ELT Vibes: International E-Journal For Research in ELT*, 5(1), 98–116. https://www.researchgate.net/publication/332030994_The_Importance_of_Mobile_Apps_in_the_English_Language_Learning_Environment

Romero-Argueta, J. de J. (2020). *Objetivo de Desarrollo Sostenible 4: Cumplimiento de la Educación de Calidad Docente.* Editorial Universidad Gerardo Barrios. https://www.ugb.edu.sv/investigacion/investigacion/investigaciones-usulutan/investigaciones-2020-usulutan.html

Romero-Argueta, J. de J., Coreas-Flores, E. O., & Severino-González, P. (2020). Responsabilidad social del estudiante universitario en El Salvador: Género y territorio/ Social responsibility of the university student in El Salvador: Gender and territory. *Revista de Ciencias Sociales*, 26, 426–439. https://doi.org/10.31876/rcs.v26i0.34137

Ross, C.., Pescitelli, M.., Smith, Heather F.., & Williams, James M. (2020). Teaching anatomy with dissection in the time of COVID-19 is essential and possible. *Clinical*

Anatomy (New York, N.y.), 34, 1135 - 1136 . http://doi.org/10.1002/ca.23640

Yang, X., & Hu, J. (2023). Chinese college students' preferences for mobile-assisted language learning classes and their effects on student engagement in English language classrooms. *Innovation in Language Learning and Teaching*, 17(5), 953–966. https://doi.org/10.1080/17501229.2023.2207564

Zhai, Chunpeng; Wibowo, Santoso (2023). A Systematic Review on Artificial Intelligence Dialogue Systems for Enhancing English as Foreign Language Students' Interactional Competence in the University. CQUniversity. *Journal contribution*. https://hdl.handle.net/10779/cqu.26026900.v1

Zhang, Danyang., & Pérez-Paredes, P.. (2019). Chinese postgraduate EFL learners' self-directed use of mobile English learning resources. *Computer Assisted Language Learning*, 34, 1128 - 1153. http://doi.org/10.1080/09588221.2019.1662455