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Transforming English Language Learning: The Role of Mobile Applications in Enhancing Skills Among Undergraduates at Thamar University, Yemen

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***Abstract*—English language acquisition is vital for academic and professional advancement in non-English-speaking countries. Traditional classroom-based English instruction in Yemeni universities is often constrained by limited resources, prompting the investigation of alternative pedagogical approaches. The literature on Mobile-Assisted Language Learning (MALL) indicates its effectiveness as a communicative tool for enhancing English language learning through mobile applications. This study examines the perceived impact of mobile applications on English language learning outcomes among undergraduate students of English at Thamar University in Yemen. The study employed a quantitative research design, using a structured questionnaire administered to 103 students from the colleges of Arts and Education, which demonstrated strong internal consistency (Cronbach's alpha = 0.908). Statistical analysis (descriptive statistics, t-tests, ANOVA) revealed a clear consensus: 78.6% of participants either 'agreed' or 'strongly agreed' that their knowledge of English language proficiency improved due to mobile learning applications. A significant gender effect was observed, with female participants reporting higher perceived benefits. Likewise, the results showed that participants from the College of Education perceived a significantly greater impact than their peers from the College of Arts. However, variables such as age, academic level, or app usage frequency did not show significant differences. The study suggests that integrating MALL into the curriculum could be highly beneficial for overcoming resource constraints and improving learning outcomes. Future research should explore the comparative effects of specific applications and their long-term impact in resource-constrained contexts.**

***Index Terms*—mobile-assisted language learning, EFL, mobile applications, Thamar University, language learning**

I. Introduction

Learning English as a foreign language (EFL) has become essential for undergraduates in educational environments

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where English is not the primary language. In Yemen, the increasing number of students enrolling in English-language departments underscores the language's strong presence and growing importance. The English departments of the Faculty of Arts and the Faculty of Education at Thamar University offer a diverse range of courses, including linguistics, literature, and translation. The students join these departments with the realization that mastering the English language can greatly determine their future success. Students are typically interested in a rewarding experience, and gamification elements, such as points, badges, or a progress bar, can serve as incentives to engage learners (Gamlo, 2019). These features can be achieved through various technological tools that supplement traditional approaches, thereby providing a motivated learning environment. Mobile-assisted language learning (henceforth, MALL) has become one of the promising alternative methods for advancing and supplementing traditional learning (Crompton & Burke, 2018; Klimova, 2019). Additionally, these applications promote personalized learning by prioritizing areas of weakness and learner interests, and by focusing on each learner's preferred learning style. This prevailing trend of incorporating mobile applications into language acquisition reflects the popularity of smartphones and tablets among college students, which has made MALL a favored teaching method (Ally et al., 2014; Al-Emran & Shaalan, 2015).

This change in the way students' access, process, and share information has been adopted due to the rapid development of mobile technology. Mobile learning (aka m-learning) is the process by which academic institutions are implementing digital tools, such as smartphones, into the learning process (Demir & Akpinar, 2018; Prieto-Blazquez, 2014). The gadgets enable students to learn on demand, communicate with teachers, and participate in affordable learning activities at times that suit them. The findings by Corlett et al. (2005) and Vavoula and Sharples (2007) demonstrate that mobile devices facilitate just-in-time learning, enhance communication between students and their teachers, and create a more personalized learning environment. As Alison (2014) stressed, mobile applications are beneficial to undergraduate learners due to their user-friendliness and intuitive interfaces. Therefore, these tools are beneficial for improving pronunciation and listening skills, as well as for reinforcing vocabulary and grammar through interactive, multimodal input. Alkhezzi and Al-Dousari (2016) postulate that such variety in content format is crucial for catering to learners with diverse preferences and learning styles. Such increased entrenchment of m-learning in education has great potential to enhance English language learning, particularly in our case at Thamar University.

Although mobile language-learning applications have become increasingly popular worldwide, there is a limited body of research specifically addressing the needs of English language learners at Thamar University. Understanding the types of mobile applications students use, their usage patterns, and how demographic factors influence learning outcomes is essential for developing research-based applications that effectively support the curriculum. This study investigates the potential of mobile applications to enhance English learning at Thamar University. It examines how various mobile applications are believed to affect English language learning outcomes among undergraduate students, focusing on app usage, effectiveness in improving language skills, demographic influences, and the relationship between usage frequency and learning outcomes.

Research Questions

The primary research questions that guided this study are:

RQ1: What is the overall perceived impact of mobile applications on English language learning outcomes among undergraduate students at Thamar University?

RQ2: What types of M-learning apps are used by the undergraduate students?

RQ3: What are students' perceptions of the effectiveness of mobile applications in improving specific English language skills (e.g., vocabulary, grammar, pronunciation, listening, and speaking)?

RQ4: Do students' gender, age group, academic level, or college affiliation significantly influence their perceptions of how mobile applications affect English learning?

RQ5: Is there a significant difference in perceived learning outcomes based on the frequency of mobile application usage?

II. Literature Review

Many studies have garnered attention by examining the influence of mobile-assisted learning, the related challenges, learning structures, and the efficacy of integrating mobile applications into language education programs (Corbeil & Mikel, 2007; Sharples et al., 2006; Vavoula & Sharples, 2008).

Over the past 20 years, the concept of m-learning has undergone significant changes. According to Sharples et al. (2006), there is a need to define mobile learning. Corbeil and Mikel (2007) define education as a system implemented through various tools that support and guide learners' goals, teaching them in accordance with their historical and cultural backgrounds. Vavoula and Sharples (2008) identified six key challenges in examining mobile learning: documenting learning in various settings, evaluating mobile learning activities and outcomes, protecting participants' privacy, assessing the usefulness of technology, considering broader social and cultural contexts, and exploring casual learning. They present a three-level structure that provides a framework for evaluating the efficacy of mobile language-learning applications. The structure is based on macro (organizational integration), meso (learning experience) and micro (usefulness).

Numerous empirical studies have examined the application of technology in language learning (Corlett et al., 2005; Costabile et al., 2008; Tayebinik & Puteh, 2012). A 10-month-long experiment was conducted by Corlett et al. (2005).

He designed an organizer for college students using a Pocket PC with wireless capabilities. The results of their study highlighted the importance of institutional support related to the course and scheduling insights, and, more importantly, the need for a wireless connection to implement m-learning. Building on the exploration of mobile learning, Costabile et al. (2008) conducted a study of Explore! to examine its academic potential. It was a program specifically designed for middle school students to enhance their archaeological field visits. Using this program, the researchers have identified the benefits and drawbacks of m-learning by comparing the experience of playing games with and without technological support. In this real-world setting, the results provide valuable insights into mobile applications, bridging the gap between traditional classroom learning and experiential learning. Tayebinik and Puteh (2012) have evaluated the benefits of technology in distance learning programs and knowledge sharing between students and tutors. Their study suggests that mobile devices play a crucial role in facilitating the acquisition of English as a second language and in making instructional materials more engaging.

There has been a recent surge in research on mobile applications for learning English (Al-Emran & Shaalan, 2015; Alkhezzi & Al-Dousari, 2016; Criollo et al., 2021; Crompton & Burke, 2018; Demir & Akpinar, 2018; Gamlo, 2019; Klimova, 2019; Zhao et al., 2025). Alkhezzi and Al-Dousari (2016) conducted a study, like many researchers on mobile applications and their impact on language learning, especially regarding Telegram in the context of ESP (English for Specific Purpose). The results showed that students' grammar and vocabulary are positively influenced, and they also identified how mobile technology aids language acquisition. In a related study, Al-Emran and Shaalan (2015) focus on teachers' and students' behaviors towards mobile learning in universities in the UAE and Oman. They surveyed 383 students and 54 teachers to identify differences in students' conduct based on age, sociocultural background, country, and mobile phone ownership. Similarly, Demir and Akpinar's (2018) quasi-experimental study reveals several factors, including the impact of mobile learning on undergraduate students' educational success, their attitudes towards mobile learning, and their ability to develop animations. Students at Dokuz Eylul University in Turkey have participated in a study that has shown a significant impact of mobile learning on their educational achievements compared to traditional learning methods. Furthermore, Crompton and Burke (2018) gathered data from students at the Bucharest University of Economic Studies. They demonstrated a positive attitude and a willingness to embrace mobile learning, mainly because of their familiarity with and use of mobile devices. The research conducted by Gamlo (2019) focused on Saudi female EFL students and showed the effect of MGBLLAs (mobile game-based language learning applications). Thirty beginner-level students have started using three free mobile applications for English learning: Gamebooks: Great Readers, Learn English Vocabulary Game Quiz, and Game to Learn English-English Tracker. The questionnaire revealed that students are motivated to use the applications for their learning, and it provided valuable insights into game-based learning in EFL. Similarly, Klimova (2019) found that mobile language-learning applications can boost university students' learning performance. The results of his statistical analysis and case study showed that mobile devices help improve academic performance in studying English vocabulary and phrases. Moreover, Criollo et al. (2021) encouraged the adoption of learning methods that help students engage more actively in their education, especially technological tools that facilitate learning through instruction. In line with the surge of mobile-assisted studies, Roy and Gandhimathi (2025) conducted a review of 16 empirical studies (2019–2023) that show that mobile applications can effectively support self-directed language learning, aligning with UNESCO's SDG4 by expanding equitable, lifelong learning opportunities. Using PRISMA 2020, the analysis highlights that MALL tools (e.g., LMS-integrated apps and mobile platforms) foster learner autonomy and sustain learning beyond classrooms, but the literature on self-directed use remains limited. Findings underscore those digital abilities are pivotal for realizing MALL's benefits, suggesting that future implementations should pair mobile tools with explicit digital literacy support to maximize sustainable, lifelong learning impacts. Zhao et al. (2025) conducted another comparative systematic review of 30 studies (2019–2023) on MALL for oral English, showing that speaking-focused research—though scarce—uses similar mixed methods and standard instruments (tests, questionnaires, interviews) in China and elsewhere, with only minor differences in sample sizes and speaking assessments. It also flags key gaps: weak theoretical grounding, few large-scale studies, and limited analysis of actual app use, thereby directing future work toward theory-informed, scalable, and usage-focused investigations of MALL's impact on speaking.

Although the majority of studies have been conducted in environments with more robust technology infrastructure and distinct educational realities, the existing body of research confirms that mobile-assisted language learning provides flexible, interactive, and skill-focused support that can enhance English acquisition. Yemen has received little attention, and Thamar University, which still uses conventional teaching methods and has few resources, has received almost none. To better integrate mobile tools into local-language learning curricula, it is necessary to conduct a context-specific study on how undergraduate EFL students use mobile applications, which skills benefit most, and how demographic factors affect outcomes.

III. Methodology

A. Study Context

The study was conducted in the English Language Departments of both the Faculty of Arts (on the University Campus) and the Faculty of Education (on Al-Da'iri Street) at Thamar University, a state university in Yemen. These departments offer comprehensive programs in English, covering literature, linguistics, and translation studies, creating a conducive

environment for investigating how undergraduate English majors learn the language. The key distinction between the two departments lies in their focus: graduates from the College of Arts are typically introduced to more specialized subjects such as English literature, linguistics, and translation, while graduates from the College of Education are prepared to teach English language at secondary schools and focus mainly on pedagogy. Both departments, however, teach courses in linguistics and English language skills.

B. Research Design and Hypotheses

To investigate the impact of mobile applications on university students' English language learning outcomes, this study employed a quantitative research design, incorporating descriptive and comparative research methods. To answer the open-ended questions, we, however, used a qualitative approach to code and classify the data.

The study's objectives were operationalized through the following null and alternative hypotheses, which were formulated based on the research questions presented in the Introduction and tested using the collected data:

H1: Mobile applications significantly improve English language learning outcomes among undergraduate students at Thamar University.

H01: Mobile applications do not significantly improve English language learning outcomes among undergraduate students at Thamar University.

H2: Students perceive mobile applications as effective in improving specific English language skills (vocabulary, grammar, pronunciation, listening, and speaking).

H02: Students do not perceive mobile applications as effective in improving specific English language skills.

H3: Students' demographic profiles (gender, age group, academic level, college affiliation) significantly influence their perceptions of how mobile applications affect English learning.

H03: Students' demographic profiles do not significantly influence their perceptions.

H4: There seems to be a strong connection between how often students use mobile applications and the learning outcomes they perceive.

H04: There does not seem to be a strong connection between how often students use mobile applications and the learning outcomes they perceive.

C. Participants

A total of 103 undergraduate university students, including both males and females, participated in this study. All of them were over 18 years of age and from the Departments of English Language in both the Faculty of Arts and the Faculty of Education at Thamar University. These participants are students from all levels, including freshmen, sophomores, juniors, and seniors, who represent the entire population. Due to the small population, we targeted the entire population to gather sufficient data and eliminate potential bias introduced by the sampling technique. Only participants who owned cell phones with installed applications used for their learning were included in the study.

D. Data Collection

This questionnaire consists of three main sections: a demographic survey focusing on general information about the participants; a second part with an open-ended question about the types of M-learning apps the students use; and a third part focusing on how the students' competence level is affected by mobile learning applications.

The demographic survey asked for information on various variables related to the respondents' background, such as age, gender, academic level (freshman, sophomore, junior, senior), college affiliation (Arts or Education), frequency of mobile application usage for language learning purposes, and duration of typical mobile application learning in each session.

We administered a structured questionnaire to gather quantitative data about "The students' perception of the effect of using mobile apps to enhance their English learning proficiency." This questionnaire was developed using a five-point Likert scale with 10 items. Participants marked their level of agreement or disagreement on the questionnaire, with 1 indicating "strongly disagree" and 5 indicating "strongly agree." We also embedded a qualitative question that asks: "Name the mobile applications you use for learning English." This qualitative inquiry aimed to understand the types of mobile apps students use for language learning.

E. Reliability and Validity

Several steps were taken to guarantee the reliability and validity of the research tools and resulting data. The questionnaire's reliability was assessed using Cronbach's alpha coefficient. The analysis revealed excellent internal consistency, with a reliability score of 0.908. To ensure the questionnaire's content validity in addressing the intended research questions, it was sent for review to a specialized jury of 7 professors, who approved its suitability and appropriateness for the study.

The Kaiser-Meyer-Olkin (KMO) test, which yielded a value of .866, and Bartlett's test of sphericity, which was significant ($\chi^2(45) = 563.88$, $p < .001$), indicate that factor analysis provided the best fit for the data. Communalities for all ten items ranged from 0.49 to 0.65, which means that each variable shared a moderate proportion of variance with the extracted factor solution, and none of them fell below the acceptable limit of 0.30. This indicates that all the items made meaningful contributions to the factor structure. The eigenvalues and scree plot indicate a strong single-factor solution,

with the first factor accounting for 55.03% of the total variance, while subsequent factors fall below the Kaiser criterion of 1. The sharp decline in the scree plot after the first component also holds a single-factor solution. These results support the questionnaire's construct validity, indicating that items 9 to 18 primarily measure a single underlying construct, suggesting that mobile applications have an impact on learning English.

F. Data Analysis

The data were collected using a structured questionnaire and analyzed in SPSS to address four research questions: RQ1, RQ3, RQ4, and RQ5. The questionnaire was structured to gather information on participants' demographics, habits, and perceptions of mobile app use for English language learning. Demographic data, app usage trends, and the impact of mobile apps on English learning were examined using descriptive statistics, including frequencies, percentages, and graphs. T-tests and one-way ANOVA were used to compare learning outcomes across gender, age group, education level, and frequency of mobile app use.

To address RQ2, we used MAXQDA (Version 24) for data coding and categorization.

IV. Results

A. Demographic Information

The participants' demographics indicate that 103 students participated in the study. The participants were from different age groups; most of them, 92 students (89.3%), were between 20 and 25 years old, followed by 8 students (7.8%) aged 25 to 30, and only 3 students (2.9%) were over 35 years old. In gender distribution, there were 28 males (27.2%) and 75 females (72.8%). Students were from all four academic levels: first-year (29 students, 28.2%), second-year (20 students, 19.4%), third-year (25 students, 24.3%), and fourth-year (29 students, 28.2%). Participants were enrolled in two colleges: the College of Arts (51 students, 49.5%) and the College of Education (52 students, 50.5%). Almost all participants (101 students, 98.1%) reported using their mobile phones to learn English, while only 2 students (1.9%) stated that they did not.

B. Mobile Apps Usage Patterns

The results show the frequency of mobile app use: over half of the students (57 students, 55.3%) reported using them daily. The other 29 students (28.2%) used them several times a week, 10 students (9.7%) used them once a week, and only 7 (6.8%) reported using them rarely.

C. Most Prevalent Mobile Applications

The findings reveal four broad categories: reference-based Mobile-Assisted Language Learning applications (Hereafter MALLAs), structured-based MALLAs, social-based MALLAs, and specialized skill-based MALLAs. Reference tools, such as “Dictionaries” and “Google Translate,” account for 54% of language-learning apps. On the other hand, despite their proven efficacy, structured learning applications (like “Doulingo,” “Z American English,” “Hallo,” “FunEasyLearn,” “English Discoveries,” “Alshamil for English,” and “Cake”) account for 26% of the MALLAs. This demonstrates students' interest in gamified, comprehensive language-learning experiences that address multiple skill domains through structured learning pathways. Furthermore, social learning and communication platforms, comprising 12 of the MALLAs, underscore the importance of directly engaging with language. These social media platforms include “Telegram” (8) and YouTube (4), and other social media platforms (2), among the most frequently used applications, highlighting the blurring boundaries between formal educational tools and general-purpose platforms that can be repurposed for language learning. Finally, mobile applications focusing on specialized language skill development account for only 8% of the usage. These MALLAs include “Speaking apps,” “Pronunciation apps,” and “Grammar apps.” This suggests learners have ongoing challenges in these particular areas.

D. Influence of Mobile Apps on Students’ English Skills

The results indicate that the majority of students, that is 48.54%, reported that mobile apps have improved their English learning. A significant portion —30.10% —strongly agreed with this statement. While only 4.85% strongly disagreed or disagreed with the statement, indicating that mobile apps have a positive influence on their English learning.

Regarding the impact of mobile apps on students' motivation to learn English, the findings indicate that a majority of participants (46.60%) agreed that these apps have increased their motivation, while 27.18% strongly agreed. A smaller portion, 18.45%, remained neutral, and 4.85% disagreed. Only 2.91% strongly disagreed, which shows that mobile apps tend to have a motivating effect on students.

The results also show the students’ opinions about whether mobile apps have helped improve their vocabulary acquisition. A large group (76.7%) reported that these apps really had enhanced their vocabulary acquisition. While 14.56% are neutral, only 8.73% either disagreed or strongly disagreed with this statement. This suggests that a majority of students believe mobile apps play a positive role in helping them learn new vocabulary.

The findings related to how mobile apps affect students’ grammar proficiency show that the largest group (62.14%) agreed that mobile apps have significantly improved their grammar, 22.33% were neutral, and 15.53% either disagreed

or strongly disagreed. This suggests that although most students appreciate that their grammar is improving, not all believe the apps are making a profound impact.

The results regarding the extent to which mobile apps have aided students in improving their pronunciation indicate that nearly two-thirds of the participants (73.79%) either strongly agreed or agreed that mobile apps have a positive effect on learning. Some students showed a neutral position (14.56%). However, a small portion of the students (11.65%) either disagreed or strongly disagreed. Therefore, this result suggests that most students consider mobile apps helpful in improving their pronunciation.

The students' listening skills improved through the use of mobile applications, as the results showed a positive impact on their ability to practice listening comprehension. A total of 67.96% of students either agreed or strongly agreed that the apps have made listening practice easier, while 21.36% of students were neutral. Only a small proportion (10.68%) did not benefit from using mobile apps to improve their listening skills.

The findings regarding students' views on whether mobile apps have provided opportunities to practice speaking English showed that nearly two-thirds of participants (72.82%) strongly agreed or agreed that mobile apps have provided such opportunities, while 14.56% were neutral. However, 12.62% did not find any benefit from using mobile apps on their speaking skills.

The statistics also indicate the impact of mobile apps on students' confidence in using English in real-world scenarios. A total of 66.01% of students either strongly agreed or agreed that mobile apps have boosted their confidence, while 21.36% were neutral. A small percentage —12.62% — disagreed. This indicates that most students believe these apps have a positive impact on their confidence in using English in real-life situations.

The findings on how mobile apps can enhance students' enjoyment of studying show that 72.82% either strongly agreed or agreed that mobile apps made learning English more enjoyable. In contrast, 18.45% were neutral, while 8.74% disagreed.

Regarding students' recommendations for using mobile apps for learning English, the statistics show that more than four-fifths of the participants (82.53%) recommended mobile apps for learning, while 9.71% were neutral; 7.76% disagreed with recommending mobile apps for learning. This means that most students feel positively about recommending mobile apps to others for learning English.

The reliability statistics for the scale measuring the effect of mobile applications on students' proficiency are shown in Table 1. The Cronbach's alpha (α) value is 0.908, which means that there was a very high internal consistency of the scale, as the value is above 0.7, which is considered reliable. The mean score for participants' responses is 38.94, with a standard deviation of 7.563, indicating the degree of variation in their perceptions of how these mobile applications affect students' proficiency levels. The high Cronbach's alpha indicates that the scale items are consistent and provide reliable data.

TABLE 1
RELIABILITY STATISTICS

	α	$N\ of\ Items$	$Mean$	SD
Impact of mobile apps on undergraduates' learning outcomes at Thamar University	0.908	10	38.94	7.563

The results in Table 2 compare the effects of using mobile applications on the participants' proficiency level across different age groups. Participants aged 20-25 years reported an average score of 3.91 (SD = 0.72), with a 95% confidence interval of 3.76-4.06. For participants aged 25-30 years, the average score was 3.56 (SD = 1.12), with a 95% confidence interval ranging from 2.63 to 4.50. Participants aged 35 years and above had an average score of 4.33 (SD = 0.59), with a 95% confidence interval of 2.88 to 5.79.

We conducted an ANOVA test to compare the impact of mobile applications across these age groups, resulting in F(2,100) = 1.30,p = 0.277. Since the p-value is greater than the 5% significance level, there is no statistically significant difference in the impact of mobile applications on participants' proficiency levels across age groups, suggesting that age does not significantly influence students' perceptions of the effectiveness of mobile apps in learning English.

TABLE 2
COMPARING MOBILE APPS' IMPACT ON ENGLISH LEARNING BY AGE GROUP

				95% Confidence Interval for Mean	
	N	Mean	SD	Lower Bound	Upper Bound
20-25 years	92	3.9087	0.72197	3.7592	4.0582
25 - 30 years	8	3.5625	1.11732	2.6284	4.4966
Above 35 years	3	4.3333	0.58595	2.8778	5.7889

$F(2,100) = 1.30, \quad p = .277$

To compare the impact of mobile applications on the underregulated acquisition of English between male and female participants, we used an independent-samples t-test. The results in Table 3 show that male participants (Mean = 3.60, SD = 0.78) report a lower impact than female participants (Mean = 4.01, SD = 0.72). The t-test uncovers a notable difference between the two groups, t(101) = -2.50, p = 0.014. So, we can conclude that female participants perceive a significantly greater impact of mobile applications on their English language learning outcomes than male participants do.

TABLE 3
INDEPENDENT T-TEST

	Male		Female			
	Mean	*SD*	*Mean*	*SD*	*t*	*p*
Impact of mobile apps on undergraduates' learning outcomes at Thamar University	3.5964	0.77864	4.0053	0.72184	−2.504	0.014

An independent samples t-test was conducted to compare the impact of mobile applications on English language learning outcomes between students from the College of Arts and the College of Education. The results in Table 4 show that students from the College of Arts (Mean 3.73, SD = 0.62) report a lower impact than students from the College of Education (Mean = 4.06, SD = 0.84). The t-test indicates a significant difference between the two groups, t(101) = -2.29, p = 0.024. This means that students from the College of Education believe that mobile applications have a greater positive effect on their English language learning outcomes than students from the College of Arts.

TABLE 4
INDEPENDENT T-TEST

	Arts College		Education College			
	Mean	*SD*	*Mean*	*SD*	*t*	*p*
Impact of mobile apps on undergraduates' learning outcomes at Thamar University	3.7255	0.6245	4.0596	0.8398	−2.288	0.024

The results in Table 5 compare the effects of using applications on students' learning outcomes across different educational levels. First-year students reported an average score of 3.81 (SD = 0.83), with a 95% confidence interval ranging from 3.50 to 4.13. Second-year students had an average score of 3.83 (SD = 0.74), with a 95% confidence interval of 3.48 to 4.17. Third-year students reported an average score of 4.16 (SD = 0.61), with a 95% confidence interval of 3.91 to 4.41. Fourth-year students had an average score of 3.80 (SD = 0.79), with a confidence limit of 3.50 to 4.10.

An ANOVA test was conducted to compare the impact of mobile applications across different education levels, which was statistically not significant, F(3, 99) = 1.38, p = 0.253. Since the p-value is greater than the 5% significance level, there is no statistically significant difference in the impact of mobile applications on English language learning outcomes between the different education levels. This means that education level does not significantly influence students' perceptions of the effectiveness of mobile apps in learning English.

TABLE 5
COMPARING MOBILE APPS' IMPACT ON ENGLISH LEARNING BY EDUCATION LEVEL

				95% Confidence Interval for Mean	
	N	Mean	SD	Lower Bound	Upper Bound
First-year student.	29	3.8103	0.82866	3.4951	4.1255
Second-year student.	20	3.825	0.73547	3.4808	4.1692
Third-year student.	25	4.16	0.61373	3.9067	4.4133
Fourth-year student.	29	3.7966	0.78943	3.4963	4.0968

$F(3, 99) = 1.381, \quad p = .253$

Table 6 analyzes the impact of mobile applications on English-language learning outcomes, based on user usage. The results show that individuals who use mobile apps daily reported an average score of 3.98 (SD = 0.83), with a 95% confidence interval ranging from 3.76 to 4.20. Individuals who use mobile applications several times a week had a mean score of 3.98 (SD = 0.47), with a confidence limit (3.80 - 4.16). Individuals who use these apps once a week reported an average score of 3.49 (SD = 0.77), with a confidence limit (2.94 - 4.04). Participants who used it rarely or never had an average score of 3.40 (SD = 0.81), with a 95% confidence interval of 2.65 to 4.15.

To compare the impact of these learning apps by usage frequency, an ANOVA was employed. The results show the following values: F(3, 99) = 2.43, p = 0.070. The p-value exceeded the 0.05 significance level, indicating that the frequency of mobile application use is not statistically significant. Therefore, this evidence suggests that students' proficiency levels are not affected by the frequency of use of mobile learning apps.

TABLE 6
COMPARING MOBILE APPS' IMPACT ON ENGLISH LEARNING OUTCOMES BASED ON USAGE

				95% Confidence Interval for Mean	
	N	Mean	SD	Lower Bound	Upper Bound
Daily	57	3.9807	0.8338	3.7595	4.2019
Several times a week	29	3.9828	0.4706	3.8037	4.1618
Once a week	10	3.490	0.7666	2.9416	4.0384
Rarely	7	3.400	0.8083	2.6525	4.1475

$F(3, 99) = 2.428, \quad p = .070$

V. Discussion

This study hypothesizes that mobile applications have a significant impact on English language learning outcomes among undergraduate students at Thamar University. Specifically, it proposes that students who use mobile applications experience improvements in key language skills —vocabulary acquisition, grammar, pronunciation, listening comprehension, and speaking fluency —as well as increased motivation, confidence, and enjoyment of learning. To explore differences across demographic variables and usage patterns, several sub-hypotheses were formulated. It is hypothesized that female students perceive greater benefits from mobile-assisted language learning than male students. Additionally, the study examines whether age group, academic level, college affiliation (College of Arts vs. College of Education), and frequency of mobile app usage significantly influence students' perceptions of effectiveness.

A. Demographic Information

The results showed strong support for the central hypothesis, with the majority of our participants reporting high perceived benefits from using mobile apps for learning English across vocabulary, grammar, pronunciation, listening comprehension, speaking fluency, and overall confidence. These self-reported gains align with broader literature, as meta-analyses consistently demonstrate that mobile-assisted language learning (MALL) yields moderate to strong positive effects on learning outcomes, particularly at the undergraduate level (Lei et al., 2022; Li, 2024). For example, a recent study by Nguyen (2024) found that Duolingo, ELSA Speak, and YouTube were the most popular tools for improving vocabulary and listening skills among 150 sophomores. Another meta-analysis by Garzón et al. (2023) found that mobile learning significantly improves English language performance among university students. Similarly, another study reported an effect size of approximately $g = 0.88$ in favor of mobile-assisted learning compared to control groups (Mihaylova et al., 2022).

Likewise, qualitative and mixed-method studies in related contexts reinforce this quantitative evidence. In a UAE-based study, female health-sciences undergraduates reported particularly positive attitudes toward mobile apps, although specific skills, such as speaking and listening, showed comparatively lower gains (Ibrahim Mohamed, 2021). Another experimental study in Vietnam revealed significantly higher post-test scores for students using a Mobile Aided Language Learning Portal (MALLP), with an impressive 97.8% pass rate compared to 36.6% in the control group (Phuc & Nghi, 2023). These consistent findings highlight that mobile apps offer flexibility, interactivity, multimedia access, and gamified features, all of which support learner engagement and sustained motivation—a benefit widely discussed in the literature (Phuc & Nghi, 2023). These affordances appear to align closely with the strong internal consistency (Cronbach's $\alpha = 0.908$) observed in the research survey, suggesting reliable measurement of students' positive perceptions.

Among the sub-hypotheses, we observed a significant difference between genders. The female students reported higher perceived benefits. It is worth noting that the study included 75 female students and 28 males. The unequal number of participants by gender may be the reason for the skew in the results. However, this does not mean that our result is incorrect. It is possible that women actually see more advantages for reasons we have not yet investigated. Rerunning the study with a more evenly distributed sample of participants would be the only way to determine whether this is a genuine gender difference or merely a statistical anomaly.

Similarly, we also noticed that students from the Education College felt a significantly more positive impact than those from the Arts College. This might have something to do with the students themselves. Generally, at our university, students accepted into the Bachelor of Education program have higher high school grades. In contrast, the BA program typically has lower entry requirements. This observation raises the question of whether the students who are already higher achievers are just more primed to see and appreciate the positive side of things.

However, the hypotheses regarding age group, academic level, and app usage frequency were not supported, as no significant differences were observed. These findings suggest that while mobile applications are broadly effective, their perceived impact may vary by gender and educational context rather than age or usage frequency.

B. Mobile Apps Usage Patterns

Our results regarding demographic variables and frequency of use were more nuanced: only gender showed a significant effect, with female students reporting greater perceived impact. Other variables, such as age group, academic level, and frequency of use, did not significantly moderate the outcomes. This pattern aligns with other studies; while some work finds that digital natives tend to show uniform levels of benefit regardless of age or experience, gender differences in perception have occasionally emerged (Ibrahim Mohamed, 2021). Meanwhile, the frequency of app use does not always translate into greater gains—likely because the quality of use matters more than just the quantity. Learner self-regulation, autonomy, and the strategic use of mobile resources appear to play a more significant role than just the time spent on the app (Lei et al., 2022). The broad effectiveness of mobile apps is supported by theories of M-learning that emphasize learner-centered, anytime-anywhere flexibility and bite-sized learning chunks. Our results align with these principles: students appreciated the portability, interactive exercises, and quick access to lexical/grammar tools. Collaborative features of certain apps (e.g., discussion boards, peer feedback) further encourage engagement and confidence, as demonstrated in computer-supported collaborative learning (CSCL) literature (Ibrahim Mohamed, 2021). Although our study focused on self-reported learning rather than social features per se, increased confidence and motivation suggest some spillover benefits of these collaborative affordances.

C. Types of Mobile-Assisted Language Learning Applications

The findings revealed four types of Mobile-Assisted Language Learning applications (MALLAs) used by the students: reference-based MALLAs, structured-based MALLAs, social-based MALLAs, and specialized skill-based MALLAs. The reference tools suggest that learners prioritize prompt comprehension support over structured learning sessions. This emphasis on lexical resources aligns with research by Alkhezzi and Al-Dousari (2016), which suggests that vocabulary acquisition is often perceived as important in EFL contexts and is considered an effective tool for enhancing this aspect of language learning. The dominance of reference tools is consistent with research on self-directed learning (Barham & Clarke, 2022). However, reliance on reference materials raises concerns about the deeper nature of linguistic development, as learners could miss out entirely on the comprehensive practice this entails. On the other hand, the use of structured learning applications - though less frequent - demonstrates student interest in gamified, comprehensive language learning experiences that address multiple skill domains through structured learning pathways which align with the findings of Vesselinov and Grego (2012), who indicate that students not only find Duolingo's game-based format compelling but also benefit from its structured approach, supporting the potential of gamified language learning for improving language acquisition. Furthermore, these findings are consistent with Gamlo's (2019) work on the motivational effects of gamified language-learning apps on EFL students in similar regional contexts. However, if we compare these gamified apps to the reference-based MLLAs, the cognitive demands these apps place on students may be the cause of this underutilization, as they may prefer the control and flexibility that reference tools provide. Although many studies have demonstrated the benefits of structured learning platforms like Duolingo for teaching (Duolingo, 2025; Jiang et al., 2020), students appear to use them less frequently than reference-based apps. Furthermore, social learning and communication platforms, making up 12 of the MALLAs, underscore the importance of directly engaging in language learning. These social media platforms highlight the blurring boundaries between formal educational tools and general-purpose platforms that can be repurposed for language learning. This finding suggests that students actively seek authentic language exposure and communication opportunities beyond dedicated language learning applications, consistent with communicative approaches to language acquisition that emphasize the use of authentic language (Crompton & Burke, 2018). Finally, mobile applications focusing on specialized language skill development account for only 8% of the usage. This suggests learners have ongoing challenges in these particular areas. The diverse range of uses for these apps, from general-purpose to skill-specific language tools, suggests that, after grasping the basics, learners engage specialized tools that address their specific weaknesses, reflecting the principle of learner autonomy. This aligns with a study by Benson (2011), who argues that technology and learning beyond the classroom give learners autonomy to take control of the learning process.

D. Methodological Limitations

Despite the positive and robust findings, this study has several methodological limitations:

Firstly, the study was limited to 103 students from Thamar University. The findings cannot be generalized to all Yemeni university students. Secondly, all data on mobile app effectiveness were collected via self-reported questionnaires. There is a risk of response bias, where students may overstate the benefits due to social desirability or limited awareness of their actual progress. Thirdly, the study captures only a snapshot in time and does not assess long-term learning outcomes or retention. A longitudinal design could have provided insights into whether improvements in vocabulary or pronunciation were sustained over time. Fourthly, while the study asked students to name the apps they use, it did not evaluate the specific pedagogical strengths or weaknesses of each app. Lastly, the research design was exclusively quantitative, which limited the ability to explore nuanced student experiences in depth.

E. Implications for Research and Practice

The results of this study carry several important implications:

Educators and curriculum designers at Thamar University should consider formally integrating mobile applications into classroom instruction. Teachers should be trained to evaluate and recommend pedagogically sound mobile apps aligned with students' skill levels. Teacher involvement can enhance the quality of learning by selecting apps that strike a balance between entertainment and real language instruction. There is a need for localized English learning apps that incorporate regional dialects, cultural examples, and curriculum-based content relevant to Yemeni students.

F. Future Research Directions

Further research should explore the long-term impact of mobile apps on English skills through pre- and post-test evaluations. Additionally, mixed-method approaches can offer deeper insights into learners' attitudes, challenges, and behavioral changes resulting from app use.

VI. Conclusion

This study concludes that mobile applications have a significant impact on English language acquisition among undergraduates at Thamar University. Students reported improvements in vocabulary, pronunciation, grammar, motivation, and overall language confidence. These findings suggest that while mobile applications are broadly effective, their perceived impact may vary by gender and educational context rather than age or usage frequency. The consistent benefits across different demographics highlight the universal effectiveness of mobile-assisted language learning. Despite

limitations, such as reliance on self-reported data and a single-institution focus, the findings support integrating mobile apps into formal English instruction. These tools provide accessible, engaging, and flexible learning opportunities, which are particularly valuable in resource-limited settings. Future research should explore app-specific impacts and long-term outcomes to further strengthen digital strategies in EFL education.

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