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Enhancing English Language Acquisition through Mobile-Assisted Language Learning (MALL): AI-Driven Strategies

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Abstract: This study explores the effectiveness of Mobile-Assisted Language Learning (MALL) in improving students' English language skills in EFL (English as a Foreign Language) classrooms. Using a quantitative approach, data were collected through questionnaires involving 20 students and analyzed using statistical tests, including one-sample t-tests, Pearson correlations, and multiple linear regression. The results show that mobile applications significantly impact students' English language skills ($r = 0.770$, $p < 0.01$) and serve as a primary predictor of learning motivation ($\beta = 0.744$, $p < 0.01$). However, the average English language proficiency (mean = 29.8) and learning motivation through mobile applications (mean = 23.3) remain below the reference value (40). Interestingly, the impact of socioeconomic status on English proficiency and students' motivation was found to be insignificant ($p > 0.05$), indicating that equal access to technology can reduce social disparities in technology-based learning. This study underscores the significant potential of MALL in enhancing English skills, emphasizing the need for optimizing applications with interactive features and personalization. Recommendations include increasing the intensity of application use, training teachers in technology integration, and implementing inclusive policies to support students from diverse socioeconomic background.

Keywords: *mobile-assisted language learning; english language skills; learning motivation; socioeconomic status; technology-based learning*

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Introduction

Mobile applications have fundamentally transformed the landscape of language acquisition (Singh et al., 2021). With the rapid advancement of technology, the process of learning languages has become increasingly accessible and convenient (Madarbakus-Ring & Ring, 2023). In contemporary society, mobile applications serve as a distinctive platform (Stead, 2012) for language learners to engage in practice and enhance their skills at any time and in any location. These applications encompass a diverse array of features, ranging from vocabulary development to interactive conversational practice, thereby catering to various learning styles and objectives. This research investigates the utilization of mobile applications in language learning, examining their effectiveness, advantages, and the array of options available to learners (Hwang et al., 2024).

One of the significant drawbacks of utilizing mobile applications for language acquisition is the propensity for distraction (Kukulska-Hulme & Viberg, 2018). The pervasive nature of smartphones presents a continuous temptation to engage with notifications, peruse social media, or participate in activities unrelated to language learning (Olasina & Kheswa, 2021). Furthermore, these mobile applications often lack the interactive engagement and feedback mechanisms characteristic of traditional classroom environments (Anshari et al., 2017). Consequently, mobile applications may not facilitate the same level of engagement and interactive learning experiences that arise from face-to-face interactions with educators and peers (Rodríguez-Triana et al., 2020). Additionally, mobile applications frequently fall short in delivering comprehensive and nuanced explanations of grammatical rules or intricate language concepts (Viberg & Grönlund, 2017).

Furthermore, mobile applications may inadequately address individual learning needs and fail to accommodate various learning styles (El-Sabagh, 2021). This limitation could hinder the app's effectiveness in catering to the diverse requirements of language learners. Additionally, there exists a reliance on technology and internet connectivity, which poses challenges in certain regions where access to reliable internet connections or smartphones is limited (Evans, 2018). Such constraints can impede individuals in these areas from utilizing mobile applications for language acquisition. Lastly, the potential absence of accountability and discipline in the use of mobile applications for language learning is noteworthy (Nguyen & Yukawa, 2019). In the absence of structured guidance from an educator or a classroom setting, learners may encounter difficulties in maintaining motivation and discipline throughout their language learning endeavors (Seven, 2020).

Mobile Assisted Language Learning (MALL), which employs mobile applications, represents a significant technological advancement within the domain of English language acquisition. The proliferation of mobile devices, including smartphones and tablets, has facilitated novel opportunities for educational engagement, particularly in the realm of foreign language instruction. MALL provides a level of flexibility and accessibility that enables learners to interact with educational materials at their convenience, irrespective of time or location (Kukulska-Hulme, 2012). Furthermore, research conducted by Viberg and Grönlund (2013) indicates that the implementation of MALL can enhance student motivation and engagement in language learning, particularly as mobile devices have become integral components of their daily routines.

Furthermore, Mobile-Assisted Language Learning (MALL) facilitates a more interactive and collaborative approach to language acquisition. Mobile-based learning applications and platforms are typically equipped with interactive features, including exercises in listening, speaking, reading, and writing, which can be customized to meet the individual needs of learners (Burston, 2014). Through these applications, students are afforded access to a diverse array of learning resources, such as videos, podcasts, and language games, specifically designed to enhance their linguistic competencies. Additionally, a study conducted by Kim et al. (2013) demonstrated that MALL can foster collaborative learning through discussion features and the provision of immediate feedback, thereby enabling students to communicate and share knowledge effectively with their peers and instructors.

From a pedagogical standpoint, Mobile-Assisted Language Learning (MALL) plays a crucial role in fostering innovative instructional methodologies. For instance, project-based learning can be augmented through the integration of mobile technology, thereby facilitating a more immersive and meaningful educational experience (Kearney et al., 2012). In this framework, mobile technology serves a variety of functions, including data collection, conversation recording, and the creation of digital

presentations that enhance language learning initiatives. Consequently, the implementation of MALL not only aids in the acquisition of linguistic competencies but also cultivates essential digital and collaborative skills that are increasingly vital in the context of globalization.

The implementation of Mobile-Assisted Language Learning (MALL) encounters several challenges that must be addressed. Stockwell (2010) identifies technical constraints, such as limited internet access and varying levels of technical proficiency among students, as significant barriers to the effective execution of MALL. Furthermore, the readiness of educators to incorporate mobile technology into the curriculum and students' attitudes toward the use of technology in learning are also critical factors influencing the success of MALL. Consequently, coordinated efforts are necessary to surmount these challenges, which include providing teacher training, ensuring adequate infrastructure, and developing learning materials that are contextually relevant and aligned with the needs of students.

Numerous studies have demonstrated that Mobile Assisted Language Learning (MALL) significantly enhances motivation and mastery of specific components within English language acquisition. Nonetheless, research evaluating the comprehensive impact of MALL on English as a Foreign Language (EFL) learners' overall language proficiency remains scarce, particularly among populations with access to technology who originate from lower-middle socioeconomic backgrounds. This study addresses this gap by examining the relationship between the intensity of mobile application usage and the acquisition of overall English language skills, while considering the mediating effects of motivation and the role of socioeconomic status. The results indicate that motivation serves as a significant mediator in this relationship, whereas socioeconomic status does not appear to be a distinguishing factor. These findings provide valuable insights, suggesting that technology-based interventions may mitigate socioeconomic barriers in language learning.

Based on the aforementioned studies, there exists a significant gap in the comprehensive understanding of the overall impact of mobile applications on English language learning. While numerous investigations have explored the effects of various mobile apps on aspects such as motivation, comprehension, vocabulary acquisition, and other linguistic skills, a holistic assessment of their efficacy remains elusive. This research encompasses a diverse array of mobile applications, including social media platforms, virtual reality tools, and game-based language learning applications, all of which were systematically evaluated for their influence on different facets of English as a Foreign Language (EFL). Nonetheless, there is a notable deficiency in the comprehensive understanding of the overall effectiveness of these applications, particularly concerning the development of English language skills. Previous research has predominantly concentrated on isolated components, such as comprehension, vocabulary usage, and motivation, without providing an integrated analysis of the advancement of English proficiency. Consequently, it is imperative to undertake further studies that emphasize the perspectives and experiences of EFL students.

The objective of this study is to conduct a comprehensive evaluation of the impact of mobile applications on the enhancement of English language skills within English as a Foreign Language (EFL) classrooms. This investigation specifically seeks to determine whether increased frequency of mobile application usage correlates with superior skill development by analyzing the relationship between the rate of usage and English proficiency. Consequently, the hypotheses of this study are articulated as follows:

H1a: There is a positive and significant relationship between mobile app usage and improved English language skills in school students.

H0a: There is no positive and significant relationship between the use of mobile apps and the improvement of English language skills in school students.

H1b: The relationship between mobile app usage and improved English skills is moderated by economic status, so that the impact is more pronounced on students with higher socioeconomic status.

H0b: Socio-economic status does not moderate the relationship between mobile app usage and improved English language skills

H1c: Self-motivation mediates the relationship between mobile app usage and English language skills improvement in school students, such that students with higher levels of self-motivation show greater improvement

H0c: Self-motivation does not mediate the relationship between mobile app usage and English language skills improvement in school students.

Literature Review

1. Mobile-Assisted Language Learning and English Language Skills

Mobile-Assisted Language Learning (MALL) encompasses the utilization of mobile devices, including smartphones and tablets, to enhance the process of language acquisition (Zain & Bowles, 2021). As noted by Karakaya & Bozkurt, (2022), MALL offers flexibility in terms of time and location, thereby fostering autonomous and contextualized learning experiences. A significant advantage of MALL lies in its capacity to deliver personalized and interactive learning opportunities through gamification-based applications, multimedia exercises, and adaptive learning methodologies (Ishaq et al., 2021). The enhancement of English language skills through MALL is typically categorized into four principal components: reading, writing, speaking, and listening (Hwang et al., 2024). These dimensions serve as critical parameters for evaluating the effectiveness of mobile applications in facilitating overall language acquisition (Cakmak, 2019).

The concept of English language skills in this context is understood as the learners' capacity to utilize the language in both spoken and written forms with a high degree of accuracy, fluency, and comprehensiveness (Plakans et al., 2019). Evaluation parameters may encompass assessments of linguistic competence (e.g., TOEFL-based scales), rubrics for oral and written communication, and measurements of students' perceptions regarding their improvement (Zhang et al., 2022). Consequently, in the data collection process, English language skills are analyzed using instruments that address essential dimensions, including text comprehension, expressive writing, oral production, and listening proficiency in the target language (Güngör & Önder, 2023).

2. MALLs and Motivation for Learning English

Motivation serves as a critical psychological factor in the acquisition of foreign languages, and its significance is further amplified within the context of technology (Qu & Wu, 2024). A pertinent theoretical framework in this regard is Self-Determination Theory (Reeve & Lee, 2019), which identifies three fundamental psychological needs: autonomy, competence, and social connectedness. Mobile-Assisted Language Learning (MALL) facilitates the satisfaction of these needs by providing learners with flexibility, self-assessment tools, and opportunities for online social interaction (Lee & Xiong, 2023). Empirical studies indicate that students' intrinsic

motivation is enhanced when engaging with applications that incorporate features such as achievements, digital rewards, and social connectivity (Sun & Hsieh, 2018).

In this context, the motivation variable is conceptualized as the internal drive of students to engage actively in language learning via mobile applications (Lai et al., 2022). The dimensions of motivation encompass intrinsic motivation, characterized by an interest in learning and personal challenge; extrinsic motivation, involving aspects such as reward and recognition; and amotivation, indicative of disinterest (El Miedany & El Miedany, 2019). Measurement parameters include an attitude scale toward digital learning, perceived usefulness of the application, and frequency of use (Alshurafat et al., 2021). The measurement instrument may take the form of a Likert-scale questionnaire grounded in validated theories of language learning motivation, such as the Language Learning Orientations Scale (Jaradat et al., 2024), which has been extensively employed in studies pertaining to Mobile-Assisted Language Learning (MALL) (Karakaya & Bozkurt, 2022).

3. Socioeconomic Impact on MALL Effectiveness and Research Context

In the socioeconomic context, the digital divide represents a significant challenge to the implementation of Mobile-Assisted Language Learning (MALL) (Figueiredo, 2023). Despite the increasing prevalence of mobile devices, disparities in internet accessibility, the quality of devices, and levels of digital literacy continue to impact learning effectiveness (Correa et al., 2020). Broer et al., (2019) emphasize that socioeconomic status is a critical factor influencing the quality of students' learning experiences, particularly among populations in less developed regions. Nevertheless, recent research indicates that MALLs possess the potential to mitigate this divide by offering free and accessible app-based learning opportunities (Ali et al., 2024).

In this study, socioeconomic status is operationally defined as an individual's economic condition, which is assessed through family income, parental education level, and access to technological resources (Avvisati, 2020). The dimensions of this variable encompass device ownership, the quality of internet access, and the extent of parental support for technology-based learning (Gonzalez-DeHass et al., 2022). Evaluation of these parameters may be conducted via demographic surveys and attitude scales related to technology, with items aligned according to the respondents' economic status (Wiese & Humbani, 2020). The significance of this variable is critical in determining whether mobile-assisted language learning (MALL) is genuinely accessible and effective across different societal strata, or whether it exacerbates existing inequalities (Figueiredo, 2023).

The context of this study centers on English as a Foreign Language (EFL) students in secondary schools located in urban and semi-urban areas of Indonesia (Low, 2020). This population is characterized by access to technological devices while exhibiting diverse economic backgrounds (Van Deursen et al., 2021). Such a framework facilitates an empirical investigation into the influence of economic factors on the efficacy of mobile technology in language learning, a critical issue within the realm of digitally-driven educational policy (Barikzai et al., 2024).

Research Method

The data collection technique employed in this study involved the administration of a questionnaire designed to assess the attitudes and perceptions of students regarding the use of smartphones in language acquisition. The analysis was conducted using quantitative methods,

specifically through a structured questionnaire analyzed with SPSS software. The primary aim of this questionnaire was to gather information concerning the functionality of applications in language practice and acquisition, with a particular focus on the development of individual language systems and skills. The questionnaire comprised approximately 26 items, which included five-point Likert scale options: "strongly agree," "agree," "neutral," "disagree," and "strongly disagree." The questionnaire was disseminated via Google Forms to a targeted group of individuals, specifically students engaged in learning English as a foreign language. Participants were requested to indicate their level of agreement with a series of statements. The study sample consisted of 40 students from MTs, comprising a randomly selected group of 15 male and 25 female participants. Informed consent was obtained in writing, and participants were assured of their anonymity prior to the commencement of the questionnaire. The analysis employed the t-test statistic to ascertain whether significant differences existed among the three groups.

Results & Discussion

Table 1 presents a detailed analysis of the sociodemographic characteristics of students and their implications for the integration of mobile learning in English language acquisition, specifically concerning motivation and socioeconomic factors. In the age distribution, a significant proportion of students, comprising 68.4%, were 14 years old, suggesting that the majority of respondents are at a transitional stage from junior high school. Conversely, those aged 13 and 15 represented only 26.4% and 5.3%, respectively, highlighting an uneven age distribution among participants. Regarding students' experiences in English courses, a notable 65% of students reported having never attended an English course, while 35% indicated previous attendance. This finding points to a limited exposure to formal English instruction outside of the school environment. Among those who had participated in English courses, the majority (26.3%) had engaged in such courses for less than one year, with only a small fraction (5.3%) having attended courses for durations exceeding one year (1-2 years and 3-4 years). This further corroborates the earlier observation that a substantial proportion of students (63.2%) had not undertaken any formal English courses.

In terms of mobile phone ownership, it is noteworthy that all students possessed a mobile phone (100%), indicating universal access to technology. Regarding the quality of internet usage, the majority of students reported accessing the internet at medium speed (85%), while a minority had access to fast internet (15%). Notably, no students indicated experiencing low-quality internet service (0%), reflecting a generally adequate digital infrastructure. The websites most frequently utilized for English language learning included Google (40%) and Google Translate (40%), suggesting a tendency among students to rely on practical tools for their learning. Additionally, Duolingo and ChatGPT were each utilized by 15% of students, indicating a burgeoning interest in AI-based learning technologies. Conversely, Brainly and YouTube were reported as resources by only 5.3% of students, suggesting a limited role in the context of English language learning.

Table 1. Demographic Information of Students

Demographic Factors		Frequency (%)
Age	13 years	26.4
	14 years	68.4
	15 years	5.3
English Course Experience	Ever	35
	Never	65
English Course Duration	< 1 year	26.3
	1-2 year	5.3
	3-4 year	5.3
	Never	63.2
Cell phone ownership	Own	100
	Do not own	0
Quality of Internet Usage	Fast	15
	Medium	85
	Low	0
Websites Frequently Used for Learning English	Brainly	5.3
	Chatgpt	15
	Duolingo	15
	Google	40
	Youtube	5.3
	Google translate	40

The findings presented indicate that the majority of students have not engaged in formal learning experiences outside the traditional classroom setting. The integration of technology-based learning applications, such as Duolingo and ChatGPT, presents a viable method for enhancing English language proficiency. Regarding technology utilization, all students possess mobile phones with internet access, thereby facilitating the implementation of technology-based programs. To augment access to learning materials and resources, it is essential to encourage the use of diverse educational tools beyond Google and Google Translate, enabling students to explore more comprehensive learning methodologies. Although most students have access to medium-speed internet, it is crucial to provide lightweight and easily accessible learning content to ensure an optimal learning experience.

The following analysis examines the factor data, number of questions, and mean scores presented in Table 2, focusing on English language skills, which comprises a total of eight questions with a mean score of 29.8. This factor exhibits the highest number of questions and a relatively elevated mean score, suggesting that students' English language skills represent a significant area of proficiency, potentially encompassing various sub-competencies such as reading, writing, listening, and speaking. In contrast, the analysis of the impact of socioeconomic status on English language improvement, which includes seven items and yields a mean score of 17.1, indicates a lower mean score compared to the other factors, despite the similar number of questions. This finding implies that while socioeconomic status may play a role in English language acquisition, its effect appears to be less pronounced or limited within the context of the respondents.

Furthermore, the investigation into students' motivation for learning English through mobile applications, which consists of six items and results in a mean score of 23.3, reveals that students exhibit

a relatively high level of motivation when utilizing mobile apps for language learning, despite the fewer number of questions. This underscores the significant role of technology, particularly mobile applications, in enhancing students' motivation to learn English.

Table 2. Responses and Mean Scores

Factor	Number of Questions	Mean Score
English Language Skills	8	29.8
Impact of Socioeconomic Status on English Language Improvement	7	17.1
Students' Motivation in Learning English through Mobile Applications	6	23.3

An in-depth analysis of the skill areas reading, writing, listening, and speaking is essential to identify the specific aspects that require further enhancement. Furthermore, there is a need to develop or adopt more interactive and contextual mobile applications to sustain student motivation. Concurrently, it is imperative to encourage teacher training to ensure the optimal utilization of these applications within the learning process. Additional investigation is warranted concerning the specific dimensions of socioeconomic status that may exert influence, such as access to learning resources, parental support, and the quality of school facilities. Moreover, providing technology-based support for students from low socioeconomic backgrounds is crucial to mitigate the learning gap.

Table 3. One-sample test Result

One-Sample Test		Test Value = 40				
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Students English Skill	-11.086	19	.000	-10.15000	-12.0663	-8.2337
Impact of Socio economic Status on English Language Improvement	-29.303	19	.000	-17.90000	-19.1786	-16.6214
Students' Motivation in Learning English by Using Mobile Apps	-8.729	19	.000	-6.65000	-8.2445	-5.0555

The results of the statistical tests conducted on the three groups in relation to the hypotheses are presented in Table 4. Significant and statistically relevant variations exist between the t-values and p-values of the three groups when compared to the null hypotheses. The table exhibits the findings from a one-sample test aimed at exploring the relationship between students' English language proficiency and the effect of socioeconomic status on the enhancement of English language skills, while considering the influence of students' motivation in learning English through mobile applications. The results indicate that the average difference in the utilization of mobile applications for the improvement of English skills among school students is influenced by socioeconomic status. Furthermore, self-motivation serves as a mediating factor in the relationship between the use of mobile applications and the enhancement of English skills, demonstrating a significant positive correlation among the three variables, with a significance value <0.05 with a significance value of 0.000. of less than 0.05 and a p-value of 0.000.

Table 4. Correlation Value

Correlations				
		English Language Skills	Impact of Socioeconomic Status on English Language Improvement	Students' Motivation in Learning English through Mobile Applications
English Language Skills	Pearson Correlation	1	.251	.770**
	Sig. (2-tailed)		.286	.000
	N	20	20	20
Impact of Socioeconomic Status on English Language Improvement	Pearson Correlation	.251	1	.290
	Sig. (2-tailed)	.286		.215
	N	20	20	20
Students' Motivation in Learning English through Mobile Application	Pearson Correlation	.770**	.290	1
	Sig. (2-tailed)	.000	.215	
	N	20	20	20

** . Correlation is significant at the 0.01 level (2-tailed).

In Table 5, the results of the correlation analysis utilizing Pearson correlation coefficients among three variables students' English language skills, the impact of socioeconomic status on English language improvement, and students' motivation to learn English through mobile applications are presented. The significance value (2-tailed) of 0.286, which is greater than 0.05, suggests that there is no statistically significant relationship between students' English skills and the influence of socioeconomic status. This finding implies that socioeconomic factors do not exhibit a strong correlation with English language skills in this study. Conversely, the analysis of students' motivation in learning English via mobile applications yielded a significance value (2-tailed) of 0.000, which is less than 0.01, indicating a highly significant positive relationship between students' English skills and their motivation to learn through mobile applications. The high correlation coefficient suggests that increased motivation in using mobile applications correlates with enhanced English skills. < 0.01 indicates that there is a highly significant positive relationship between students' English skills and motivation to learn using mobile apps. The high correlation value indicates that the higher the students' motivation in using mobile apps, the better their English skills. It can be concluded that there is a highly significant positive relationship between students' English skills and students' motivation in learning English by using mobile apps $r = 0.770$, $p < 0.01$. This indicates that effective use of mobile apps can be an important factor in improving students' English skills. There was no significant correlation between the impact of socioeconomic status and the other variables, indicating that socioeconomic status may not be a major factor in the context of English learning in this sample.

Therefore, it can be concluded that there exists a highly significant positive relationship between students' English skills and their motivation to learn English using mobile applications, with a correlation coefficient of $r = 0.770$ and $p < 0.01$. This finding underscores the potential of effectively

utilizing mobile applications as a critical factor in improving students' English language skills. Furthermore, the lack of significant correlation between socioeconomic status and the other variables indicates that socioeconomic status may not be a major determinant in the context of English language learning within this sample.

Table 5. Correlation Value between Variables

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.666	4.512		.591	.562
	Students English Language Skills(X1)	.619	.131	.744	4.710	.000
	Impact of Socioeconomic Status on English Language Improvement(X2)	.129	.197	.104	.656	.521

a. Dependent Variable: Students' Motivation in Learning English by Using Mobile Application (Y)

In Table 6, the interpretation of the coefficient results from the regression analysis reveals that the dependent variable is student motivation in learning English through mobile applications. The two predictors are student English skills and the impact of socioeconomic status on English language improvement. The significance value of 0.562 ($p > 0.05$) indicates the baseline value of student motivation when both predictors are held at zero. However, the constant term is not statistically significant at $p = 0.562$, suggesting its limited relevance in this model.

Conversely, the significance value for students' English language skills is $0.000 < 0.05$ for each increase in students' English skills, students' motivation increased by 0.619 indicating that students' English skills are a very strong predictor of motivation for learning English using mobile, with the highest contribution compared to socioeconomic impact on English improvement. The significant value of $p = 0.000$ indicates that the relationship between English skills and motivation for learning English using mobile apps is statistically significant. ($p < 0.05$), indicating that for each incremental increase in students' English skills, their motivation increases by 0.619. This result highlights that students' English skills serve as a robust predictor of motivation for learning English through mobile applications, contributing more significantly than the socioeconomic impacts on English improvement. The significant p-value of 0.000 underscores the statistically significant relationship between English skills and motivation in the context of mobile learning.

In contrast, the impact of socioeconomic status on English improvement yields a significance value of 0.521 ($p > 0.05$). Here, students' motivation increases only by 0.129, indicating a minor influence. This finding reflects the weak contribution of socioeconomic factors to learning motivation. The insignificant p-value of 0.521 further suggests that the relationship between socioeconomic status and motivation is not statistically significant. In conclusion, it can be asserted that students' English language skills exert a significant and substantial influence on their motivation. This emphasizes the necessity of enhancing students' English skills to foster learning motivation through mobile applications. Conversely, socioeconomic status appears to lack a significant effect on students' motivation in mobile learning

contexts, indicating that socioeconomic factors may not be a primary determinant of student motivation in this setting.

Table 6. Regression Analysis

ANOVA ^b						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	132.922	2	66.461	12.893	.000 ^a
	Residual	87.628	17	5.155		
	Total	220.550	19			

Interpretation of the ANOVA analysis results presented in Table 8 assesses the regression model with the dependent variable of student motivation, indicating that the model effectively accounts for a substantial portion of the variation in the data. The mean square value of 66.461 represents the average variation explained by the model, in contrast to the unexplained variation of 5.155. The ratio of the mean square for regression (66.461) to the mean square for residuals (5.155) illustrates the model's overall effectiveness in elucidating the dependent variable relative to the residual variable.

The significance value (p) is less than 0.05, suggesting that the regression model as a whole is statistically significant in predicting students' motivation in learning English through mobile applications. This implies that at least one of the predictors, specifically socioeconomic status, significantly impacts the enhancement of students' English language proficiency and skills, contributing meaningfully to the variability in students' motivation. In conclusion, the regression model incorporating two predictors namely the impact of socioeconomic status on improvements in English language proficiency and students' English skills demonstrates statistical significance, with $F = 12.893$ and $p < 0.05$ indicating that both variables together have a significant influence on students' motivation to learn English. This indicates that both variables collectively exert a significant influence on students' motivation to learn English.

Table 7. Impact of three variables

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.776 ^a	.603	.556	2.27038

a. Predictors: (Constant), Impact of Socioeconomic Status on English Language Improvement (X2), Students' English Language Skills (X1)

A systematic literature review of 16 selected studies pertaining to Project-Based Learning (PBL) with Technology Integration in In-service Teacher Education revealed that the most frequently utilized technologies in conjunction with PBL include social media, followed by learning management systems, cloud computing, computer programming, and websites.

Mobile-assisted language learning (MALL) has emerged as a promising approach to enhancing English language proficiency (Morchid, 2020), providing learners with numerous opportunities to engage with the language across diverse contexts. MALL employs mobile technologies, such as smartphones and tablets, to facilitate language learning and practice in a portable manner. This modality enables learners to access educational resources, communicate with peers, and immerse themselves in the target language at their own pace. This study examines the impact of MALL on the acquisition and

enhancement of English language competencies, particularly vocabulary acquisition. The findings indicate a significant positive relationship between the usage of mobile applications and students' English language skills. This aligns with the existing literature (Annamalai et al., 2022), which asserts that the utilization of app-based technology can enhance essential skills, including reading, writing, speaking, and listening. The high correlation value underscores the significance of mobile applications in fostering a personalized, flexible, and gamified learning experience, thereby motivating students to adopt a more active role in their language learning endeavors.

The results of the t-test indicated that the average skill levels of the students remained below the established benchmark, suggesting that, while the mobile application demonstrated effectiveness, additional efforts are necessary to ensure that students' language skills meet the expected standards. This shortfall may be attributed to the insufficient frequency or quality of the app's use by the students. The integration of mobile technology in language learning has been extensively investigated in recent years (Sadah, 2015). Empirical research has illuminated the potential advantages of mobile technology, including enhanced learner autonomy, personalized learning experiences, and improved language proficiency. Such technology allows learners to engage with the target language at their own pace and within their preferred contexts, thereby transcending the limitations of traditional classroom-based instruction. The flexibility and learner-centered approach afforded by Mobile-Assisted Language Learning (MALL) can lead to a more effective and engaging language acquisition process (Setiyanti et al., 2022), ultimately fostering improvements in various competencies, including vocabulary, grammar, listening, speaking, reading, and writing.

Mobile applications have demonstrated considerable efficacy in language acquisition, attributable to their interactive characteristics and tailored learning experiences (Melnychuk et al., 2024). These applications frequently incorporate gamification, multimedia components, and adaptive learning algorithms to enhance user engagement and improve knowledge retention (Rzyankina et al., 2024). Empirical evidence indicates that consistent utilization of language learning applications can lead to substantial advancements in vocabulary (Parra et al., 2024), grammar (Yan, 2023), and pronunciation skills (Chen et al., 2022). Furthermore, the accessibility of language learning resources through mobile applications facilitates the seamless integration of language practice into users' daily routines (Liu, 2022). This continual exposure to the language serves to reinforce learning and sustain motivation, ultimately resulting in more consistent progress over time (Rahimi, 2024).

Despite the potential advantages of Mobile-Assisted Language Learning (MALL), several scholars have raised concerns regarding its efficacy and possible disadvantages. A primary criticism is that the utilization of mobile devices can be distracting, thereby resulting in a fragmented learning experience (Kusnanto et al., 2024). Learners may become easily sidetracked by notifications, social media, or other applications on their devices. Furthermore, the limited screen size and restricted input capabilities of mobile devices can impede certain language learning activities, such as extended writing tasks or intricate grammar exercises. Additionally, numerous studies underscore the significance of face-to-face interaction and feedback from language instructors, which may be constrained in MALL-based methodologies. Moreover, disparities in access to mobile technology and varying degrees of digital literacy among learners may raise equity concerns, potentially disadvantaging specific groups. While MALL offers flexibility and personalization, it is imperative to ensure that its implementation complements and enhances traditional language learning methods and instructor-led tutoring, rather than replacing them.

Socioeconomic status was found to have no significant correlation with students' English language skills and motivation to learn through mobile applications. This finding contradicts previous research conducted by Iswahyudi et al. (2023), which indicates that socioeconomic status frequently serves as a barrier to access to technology and language learning. In the context of this study, the full access to mobile devices—with 100% of students owning cell phones—and adequate internet quality, with 85% of students reporting moderate to fast internet access, appears to mitigate this barrier, thereby enabling students from diverse backgrounds to effectively utilize learning applications.

While the influence of socioeconomic status on English proficiency is well-documented, it is crucial to acknowledge that individuals from lower socioeconomic backgrounds can still cultivate strong English language skills through determination and diligence. Despite encountering various challenges, such as limited access to resources and reduced opportunities for language practice, some individuals from disadvantaged backgrounds have successfully navigated these obstacles to achieve high levels of English proficiency. This phenomenon underscores the resilience and adaptability inherent in the human spirit and suggests that socioeconomic status should not be perceived as an insurmountable barrier to language learning. Ultimately, a nuanced approach that recognizes individual challenges and potential is essential to fully comprehend the complex relationship between socioeconomic status and English proficiency.

It is imperative to acknowledge that socioeconomic status can present substantial challenges that impede the development of robust English language skills among individuals from lower socioeconomic backgrounds. Limited access to high-quality education, reduced opportunities for language practice, and insufficient exposure to English-speaking environments can significantly obstruct language acquisition. Although individual determination and diligence are commendable attributes, they may prove insufficient to surmount the systemic barriers encountered by those from disadvantaged backgrounds. A more equitable approach that addresses these structural inequalities is essential for effectively supporting the language development of all individuals, irrespective of socioeconomic status.

Mobile applications have been widely acknowledged as effective instruments for language acquisition (Jeon, 2022), providing numerous advantages that contribute to successful language learning (Nicolaou et al., 2024). Among these benefits are the following: Increased Flexibility: A primary advantage of employing mobile applications for language learning is the flexibility they afford (Yeganehpour, 2023). Language learners can utilize these applications at their convenience and pace, thereby integrating study time into their demanding schedules (Ma, 2017). Personalization: Mobile applications frequently offer a personalized learning experience, tailored to the individual needs and preferences of language learners. Multimedia Learning: These applications incorporate a variety of multimedia elements, including audio recordings, videos, and interactive exercises, thereby rendering the language learning process more engaging and interactive (Kukulska-Hulme et al., 2017). Gamification: Numerous language learning applications integrate gamification elements (Dehghanzadeh et al., 2021), such as rewards, achievements, and interactive challenges. These gamified features not only enhance the enjoyment of language learning but also serve to motivate learners to persist in practicing and improving their language skills. Social Interaction: Certain language learning applications include functionalities that promote social interaction among learners (Dehghanzadeh et al., 2021). This capacity enables learners to connect with fellow language enthusiasts, practice speaking with native speakers, and engage in collaborative learning activities, thereby enhancing their language skills within a social context.

The efficacy of mobile applications in language acquisition has been substantiated, particularly due to their interactive characteristics and the provision of personalized learning experiences (Golonka et al., 2014). These applications frequently employ gamification, multimedia components, and adaptive learning algorithms to enhance user engagement and facilitate knowledge retention (Lavoué et al., 2018). Empirical research indicates that consistent utilization of language learning applications can lead to substantial advancements in vocabulary, grammatical proficiency, and pronunciation skills (Klimova, 2021). Furthermore, the accessibility of language learning resources through mobile applications enables users to integrate language practice into their daily routines seamlessly. This continuous exposure to the target language reinforces learning and sustains motivation, thereby contributing to more consistent progress over time (Oxford & Shearin, 1994). Additionally, the capacity to monitor progress and establish personalized learning objectives within these applications empowers learners to take ownership of their language acquisition journey.

The exploration of student motivation in learning English through mobile applications has emerged as a salient area of inquiry within the domain of language education. The integration of mobile devices into the daily lives of many students presents an opportunity for enhancing the language learning experience through the utilization of mobile applications. Research indicates that students' motivation to engage with these mobile apps exhibits a significant positive correlation with their English language proficiency, positioning motivation as a primary predictor of success in language acquisition. This finding aligns with the research conducted by Ambarwati et al. (2021), which underscores the pivotal role of motivation in facilitating effective technology-based learning. Notably, mobile applications that incorporate gamification elements, such as Duolingo and ChatGPT, have been shown to substantially increase student motivation; however, it is important to note that these platforms are currently utilized by only a minority of 15% of students.

Nevertheless, student motivation remained below the established benchmark. This finding underscores the necessity for more effective strategies to enhance student engagement with the application, including the incorporation of social and collaborative features. While the results indicated that the mobile application was effective in improving students' English language skills and motivation, the study has certain limitations (Haryadi et al., 2023). Specifically, the study was conducted with a sample of students from a single region, raising concerns about the generalizability of the findings. Additionally, the study did not assess the intensity of app usage, which may have implications for the results.

The findings from the aforementioned research will contribute to a more nuanced understanding of the role of mobile technology in enhancing student motivation and engagement in English language learning. The insights derived from this study can inform the development of more effective and motivating mobile-based language learning solutions, ultimately facilitating improved language proficiency and academic success among students. While mobile applications possess the potential to enhance language learning, there are also significant concerns regarding the negative impact such technologies may have on student motivation. Some scholars contend that the constant availability and convenience of mobile devices may result in distraction and diminished focus during language learning activities (Lestyaningrum et al., 2022). Furthermore, the incorporation of gamification and entertainment-oriented features in many mobile applications can divert students' attention from essential language learning objectives, leading to a more superficial engagement with the material. It is imperative to consider these potential drawbacks and to ensure that mobile-based language learning

solutions are meticulously designed to sustain and enhance student motivation rather than undermine it.

Conclusion

This research underscores the significant role of Mobile-Assisted Language Learning (MALL) in enhancing students' English language proficiency. The analysis reveals a positive and substantial correlation between the use of mobile applications and students' English language skills, identifying mobile apps as a primary predictor of students' learning motivation. These findings affirm that the effective utilization of mobile applications can elevate students' motivation and expedite their acquisition of English language skills, encompassing reading, writing, speaking, and listening. Nevertheless, the results also indicate that the average English language proficiency and learning motivation of students utilizing mobile applications remain below the established standard score. This suggests that, despite the notable contributions of mobile apps, there is a requisite to enhance the quality and intensity of app usage to attain optimal outcomes. Conversely, the influence of socioeconomic status on students' English language skills and learning motivation was found to be statistically insignificant. This observation implies that equitable access to technology, including cell phone ownership and sufficient internet connectivity, may mitigate socioeconomic barriers in technology-mediated learning environments.

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