



Gender Differences in Vocational Students' Perceptions of Mobile-Assisted English Learning: A TAM-Based Study

Aura Khalisha Kamiliya¹, Ratih Novita Sari²

^{1,2}Teacher Training and Pedagogy, University of Muhammadiyah Prof. Dr. HAMKA,
East Jakarta, Indonesia

Article Info	Abstract
Received: 2026-07-11 Revised: 2026-08-01 Accepted: 2026-08-17 Keywords: <i>EFL, Gender Differences, MALL, Perception, TAM</i> DOI: 10.24256/ideas.v14i1.11770 Corresponding Author: ratihnovitasari@uhamka.ac.id Teacher Training and Pedagogy, University of Muhammadiyah Prof. Dr. HAMKA, East Jakarta, Indonesia	<i>This study investigates whether significant gender differences exist in vocational high school students' perceptions of Mobile-Assisted Language Learning (MALL) for English learning based on the Technology Acceptance Model (TAM). Vocational students represent a distinctive EFL population whose preparation for direct workforce entry makes mobile English learning tools particularly relevant to their immediate educational goals, yet this group remains underrepresented in existing MALL research. A quantitative comparative survey design was employed involving 156 students from a vocational high school in South Jakarta, comprising 121 female and 35 male students, an imbalance reflecting the actual enrollment distribution of the participating study programs. Data were collected using an adapted fourteen-item TAM-based questionnaire measuring four constructs: Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Attitude Toward Use (ATU), and Behavioral Intention (BI), and were analyzed using a Mann-Whitney U test. The results revealed no statistically significant differences between male and female students across all four TAM constructs (all $p > .10$), with uniformly negligible small effect sizes, indicating that gender did not function as a statistically detectable differentiating factor in students' perceptions of MALL within this sample. These findings suggest that vocational EFL practitioners may find it more productive to strengthen the overall quality of MALL integration through task design that connects mobile learning to students' vocational English needs, rather than prioritizing gender-differentiated instructional approaches.</i>

1. Introduction

The rapid expansion of mobile technology has fundamentally transformed language learning practices, particularly in the context of English as a Foreign Language (EFL). Mobile-Assisted Language Learning (MALL) has emerged as a widely adopted pedagogical approach that leverages the affordances of smartphones and mobile applications to facilitate language acquisition beyond the boundaries of the conventional classroom. Mobile applications offer opportunities for independent learning, flexible access to educational resources, and interactive features that are highly beneficial for language learners in both formal and informal settings (Yuan et al., 2023). The growing penetration of mobile devices among learners at the secondary and tertiary levels has made MALL a particularly relevant and practical strategy for EFL instruction, especially in developing countries where access to technology continues to expand rapidly.

Vocational high school students represent a distinctive learner population whose relationship with MALL needs particular attention. Unlike their peers in general secondary or higher education, vocational students are preparing for direct entry into the workforce, where English communication skills are increasingly expected across various industry sectors (Skarpaas & Hellekjær, 2021). Mobile applications that support vocabulary acquisition, oral communication, and workplace English are not merely supplementary tools but potentially aligned with vocational students' immediate learning goals. This practical orientation may enhance the perceived usefulness of MALL among this population, making vocational settings a particularly meaningful context for examining technology acceptance in language education.

Despite the growing adoption of MALL in EFL settings, the successful integration of mobile technology into language learning is not solely determined by the availability of devices or applications. A critical theoretical and practical problem lies in understanding how students cognitively and affectively perceive mobile learning tools, as these perceptions directly shape their willingness to engage with such technology (Alhadijah, 2023; Garcı, 2018; Maranguni, 2019).

Student perceptions function as the central mechanism in the Technology Acceptance Model (TAM), originally proposed by (Davis, 1993), which explains technology acceptance through four interrelated constructs: Perceived Usefulness (PU) refers to the degree to which a learner believes that using the technology will enhance performance; Perceived Ease of Use (PEOU) reflects the belief that using the system requires minimal effort; Attitude Toward Use (ATU) captures the affective evaluation of using the technology; and Behavioral Intention (BI) represents the learner's motivation to use the technology in the future. In TAM, PU and PEOU are posited to predict ATU, which in turn predicts BI (Venkatesh et al., 2000). Understanding these perceptions is essential for explaining why some students voluntarily engage with mobile learning tools while others resist, especially in contexts where motivational and cognitive factors are deeply intertwined.

Several recent studies have examined technology acceptance among EFL learners through the lens of TAM, underscoring the relevance of PU, PEOU, ATU, and BI as central constructs in predicting the adoption of mobile learning tools. (Alhadijah, 2023) investigated students' perceptions of MALL among undergraduate EFL learners using a Structural Equation Modeling approach and found that PU and PEOU significantly predicted students' attitudes and behavioral intentions toward MALL.

Similarly, (Garcı, 2018) explored how higher education students accepted and used mobile-assisted language learning and highlighted that attitudinal responses and cognitive beliefs about technology are integral to MALL engagement. (Maranguni, 2019) conducted a systematic literature review of TAM in educational contexts and affirmed that

TAM consistently explains technology acceptance across diverse learner populations and instructional settings. (Abdulaziz et al., 2021), examining TAM in a language learning context, further confirmed that PU and PEOU were the primary predictors of both ATU and BI, with gender and experience functioning as secondary variables with inconsistent effects.

More recent contributions to the field have extended TAM to incorporate additional psychological and demographic variables. (Peng et al., 2023) integrated TAM with the Stimulus-Organism-Response (S-O-R) model to examine how mobile learning enhances English language outcomes and found that technology acceptance constructs significantly mediated the relationship between mobile affordances and learning performance. (He & Li, 2023) applied TAM alongside self-determination theory to investigate continuance intention in second language mobile learning, concluding that perceived usefulness and autonomous motivation jointly drive learners' sustained engagement with MALL platforms. These studies collectively establish a robust empirical foundation supporting the use of TAM as a framework for understanding MALL adoption, while also revealing that learner-specific characteristics remain underexplored.

However, current MALL studies have largely treated learners as a homogeneous group, with limited systematic attention to individual differences such as gender. Research in educational technology has consistently documented that male and female learners may differ in their cognitive beliefs, affective responses, and behavioral intention toward technology use (Barz et al., 2024; Karakoyun & Başaran, 2024).

Some studies have found gender-related differences in technology acceptance, suggesting that male learners tend to report stronger PU while female learners express greater sensitivity to PEOU (Ong & Lai, 2006). (Csizér & Albert, 2024) Examining gender-related differences in the autonomous use of technology in second language learning found that motivational and emotional variables affected male and female learners differently in their technology engagement. Similarly, (Liu et al., 2023), in a study of mobile resources and lifelong learning among Chinese EFL students, found that gender influenced learners' preferences for certain types of mobile resources.

However, other studies point toward a narrowing of these differences. (Al-qdah et al., 2025) demonstrated that, while gender differences in e-learning tool usage were observable, they were more prominent in attitudinal aspects than in core beliefs about usefulness. (Ebadi & Raygan, 2023) found that facilitating conditions and prior technology exposure were stronger predictors of PU and PEOU than learner demographics in MALL contexts. Taken together, the evidence on gender differences in TAM-based MALL research remains mixed and context-dependent, highlighting the need for empirical investigation in specific educational settings.

Despite the growing body of research on TAM and MALL, studies that specifically examine gender as a grouping variable in comparing students' perceptions of MALL using the complete TAM framework remain scarce, particularly in secondary vocational EFL contexts. Most studies either focus on general technology acceptance without disaggregating by gender, or treat gender as a moderating variable in structural models rather than comparing group-level perceptions directly (Barz et al., 2024; Rodríguez-Arce et al., 2023). This distinction matters methodologically: the present study does not test whether gender moderates the relationship among TAM constructs, but rather whether male and female students, as two distinct groups, differ in their mean perceptions of PU, PEOU, ATU, and BI.

This gap is particularly pronounced in vocational secondary school settings, where learners are often preparing for industry and may have distinct relationships with mobile technology compared to university students. Based on this gap, this study is guided by the

following research question: Is there a significant difference between male and female students' perceptions of Mobile-Assisted Language Learning (MALL) for English learning based on the Technology Acceptance Model (TAM)?

In response to the research question, this study is guided by the following hypotheses. The null hypothesis (H0) holds that there is no statistically significant difference between male and female students in at least one of the four TAM constructs. The alternative hypothesis (H1) holds that there is a statistically significant difference between male and female students in at least one of the four TAM constructs. This study aims to examine and compare male and female vocational high school students' perceptions of MALL for English learning by analyzing each of the core TAM constructs.

The objectives are twofold: first, to analyze students' overall perceptions of MALL in terms of PU, PEOU, ATU, and BI; and second, to determine whether statistically significant differences exist between male and female students across these constructs. The novelty of this study lies in its application of the complete TAM framework to a gender-comparative group analysis within a vocational secondary school EFL context in Indonesia, a population that has been underrepresented in existing MALL literature. By providing empirical evidence on gender-based differences in TAM construct perceptions, this study contributes to a more nuanced understanding of technology acceptance in mobile-assisted language learning.

2. Method

Research Design

This study employed a quantitative comparative survey design to examine gender differences in vocational high school students' perceptions of MALL based on the TAM. This design was selected because the study involves the measurement of students' perceptions in numerical form and the statistical comparison of two independent groups, namely male and female students, across multiple variables. The comparative approach allows for systematic analysis of whether observed differences between groups are statistically significant rather than attributable to random variation.

Research Setting and Participants

The study was conducted at a vocational high school in South Jakarta, where English is taught as a Foreign Language (EFL) and mobile technology is commonly integrated into students' daily activities. A total of 156 students participated in the study, comprising 121 female students and 35 male students, drawn from several upper secondary classes across two study programs: Office Administration and Accounting. Participants ranged in age from 15 to 17 years old and were enrolled in the tenth and eleventh grades at the time of data collection. Their English proficiency was determined as ranging from elementary to pre-intermediate based on their current curriculum level, as both programs follow the national vocational curriculum in which English is taught at the A1 to B1 range. No formal proficiency test was administered; curriculum level was used as a proxy indicator.

A convenience sampling technique was employed, as participants were selected from classes accessible during the data collection period. This approach was chosen for practical reasons, including institutional scheduling constraints and the limited timeframe available for data collection within the school setting; it also limits the representativeness of the sample and restricts the generalizability of the findings beyond the participating school.

Regarding the gender composition of the sample, the imbalance between female (n=121) and male (n=35) participants reflects the actual enrollment distribution within the participating study programs. Office Administration and Accounting programs at vocational high schools in Indonesia are predominantly attended by female students, making a balanced gender ratio difficult to achieve without purposive sampling across multiple schools or programs. This demographic reality should be considered when interpreting the findings, as the unequal sample sizes may have reduced the statistical power to detect subtle gender differences. Because participants were school students under 18 years of age, parental or guardian consent was obtained prior to data collection, alongside institutional approval from the school administration.

Instrument and Data Collection

Prior to Data collection, the questionnaire underwent content validity evaluation by an expert lecturer in English Language Education. The expert assessed each item for relevance, clarity, appropriateness, and representativeness with respect to the four TAM constructs. Revisions were made based on the expert's feedback before the final version of the instrument was administered to participants.

Data were collected using a self-administered questionnaire adapted from three validated sources corresponding to each TAM construct. The items for Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) were adapted from (Davis, 2014), specifically items from the PU scale (items 3, 6, 10, and 14) and the PEOU scale (items 5, 8, 11, and 14) as presented in Tables 1 and 2 of the original instrument. The items for Attitude Toward Use (ATU) were adapted from (Weng et al., 2018), specifically items Q9, Q10, and Q11 from their validated ATU subscale, which was itself grounded in Davis's (1989) TAM framework and applied to school-based technology use. The items for Behavioral Intention (BI) were adapted from (Linus et al., 2025), specifically items 1, 2, and 5 from their Intention Toward Use subscale, which measured college students' intention to utilize online instructional tools for learning.

The adaptation process involved targeted wording modifications to align each item with the vocational EFL context of the present study, while preserving the original construct meaning. For PU, workplace-related terminology in the original items was replaced with explicit references to mobile applications for English learning. For example, the original item addressing task efficiency was rephrased as "Using mobile apps helps me learn English more quickly." For PEOU, the original reference to an electronic mail system was replaced with mobile apps for learning English.

One negatively worded item in the original PEOU scale was also rephrased as a positive statement, specifically to the formulation "I can use mobile apps for learning English without much effort." For ATU, references to multimedia material in class in items were replaced with mobile apps, as in the adapted item "I enjoy learning English using mobile apps." As well as BI, references to online instructional tools and online learning were replaced with mobile apps, producing items such as "I intend to use mobile apps as part of my English learning."

The final questionnaire consisted of fourteen items: four items for PU, four Items for PEOU, three items for ATU, and three items for BI. All items were rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was distributed as a Google Form and completed individually by students using their mobile phones during regular English class sessions.

Before completing the questionnaire, students received a brief explanation of the study's purpose and instructions in Indonesian. Participation was voluntary, responses were kept anonymous and confidential, parental or guardian consent was secured in advance, and institutional approval was obtained from the school administration prior to data collection.

Table 1. Reliability Statistics Test Results

Construct	Cronbach's Alpha	N of Items
PU	.958	4
PEOU	.966	4
ATU	.959	3
BI	.948	3
All	.985	14

The internal consistency of the instrument was then examined using Cronbach's Alpha at both the overall instrument level and for each construct separately. Construct-level reliability coefficients were $\alpha = .958$ for PU, $\alpha = .966$ for PEOU, $\alpha = .959$ for ATU, $\alpha = .948$ for BI. According to (Taber, 2018), values in this range are generally described as excellent, confirming that each subscale consistently measured its intended construct. The overall reliability coefficient across all fourteen items was $\alpha = .985$, which also indicates excellent internal consistency.

However, (Taber, 2018) cautions that an exceptionally high overall alpha value may reflect a degree of item redundancy, where items within a scale elicit highly similar response patterns rather than capturing meaningfully distinct dimensions of the same construct. This concern is more relevant to the overall instrument alpha than to the individual subscale values, as the overall alpha is calculated across four discrete constructs and is naturally inflated by the shared variance within each subscale. Future researchers are nonetheless encouraged to conduct item-level analysis or confirmatory factor analysis to assess whether the subscales, particularly PU and PEOU, can be refined without compromising construct validity.

Data Analysis

Descriptive statistics, including mean scores and standard deviations, were computed to describe the general pattern of students' perceptions across the four TAM constructs for each gender group. Prior to hypothesis testing, two prerequisite assumption tests were conducted: a normality test using the One-Sample Kolmogorov-Smirnov test, and a homogeneity test using Levene's test for equality of variances. The Independent Sample T-Test was planned as the primary inferential technique to examine whether statistically significant differences existed between male and female students on each TAM construct, provided that both normality and homogeneity assumptions were satisfied. In the event that normality and homogeneity assumptions were not met, the analysis would shift to the non-parametric technique named the Mann-Whitney U test as the appropriate nonparametric alternative. The level of significance was set at $p < .05$.

3. Result

This section presents the findings of the study in three parts: (1) the results of the normality and homogeneity assumption tests, (2) the descriptive statistics of students' perceptions by gender across the four TAM constructs, and (3) the results of the inferential analysis examining gender differences in those perceptions.

Normality and Homogeneity Tests

Prior to the main analysis, normality and homogeneity tests were conducted to determine the appropriate inferential technique. The normality of the data was examined using the One-Sample Kolmogorov-Smirnov test. The results are presented in Table 2.

Table 2. One-Sample Kolmogorov-Smirnov Test Results

	PU	PEOU	ATU	BI	Overall Perceptions
N	156	156	156	156	156
Mean	15.56	15.53	11.63	11.48	54.21
SD	4.50	4.41	3.44	3.36	15.07
Test Statistic	.186	.164	.177	.148	.147
<i>P</i> (2-tailed)	.000 ^c	.000 ^c	.000 ^c	.000 ^c	.000 ^c

The normality test results indicate that the data for all four TAM constructs as well as overall perceptions were not normally distributed, as all *p*-values were .000, falling below the significance threshold of .05. Given that the normality assumption was not met, the independent samples *t*-test could not be applied. Consequently, the analysis was shifted to the Mann-Whitney *U* test as the appropriate nonparametric alternative.

For reference, the homogeneity of variance was also examined using Levene's test. The results are presented in Table 3.

Table 3. Levene's Test for Homogeneity of Variance

Construct	F	<i>Sig</i>
Perceived Usefulness (PU)	.989	.322
Perceived Ease of Use (PEOU)	1.745	.189
Attitude Toward Use (ATU)	1.902	.170
Behavioral Intention (BI)	.425	.515

Although the homogeneity test results indicate that the variances across gender groups were equal for all four constructs ($p > .05$), the normality assumption had already been violated. Therefore, the Mann-Whitney *U* test was retained as the inferential technique for hypothesis testing.

Descriptive Statistics by Gender

Descriptive statistics for each TAM construct by gender group are presented in Table 4 below.

Table 4. Descriptive Statistics of TAM Constructs by Gender

Construct	Gender	N	Mean	SD	Median	IQR
Perceived Usefulness (PU)	Female	121	15.31	4.55	16.00	7.00
	Male	35	16.43	4.27	17.00	4.50
	Total	156	15.56	4.50		
Perceived Ease of Use (PEOU)	Female	121	15.27	4.52	16.00	8.00
	Male	35	16.43	3.92	17.00	5.00
	Total	156	15.53	4.41		
Attitude Toward Use (ATU)	Female	121	11.41	3.52	12.00	6.00
	Male	35	12.43	3.05	13.00	3.00
	Total	156	11.63	3.44		
Behavioral Intention (BI)	Female	121	11.31	3.41	12.00	6.00
	Male	35	12.06	3.17	12.00	5.00
	Total	156	11.48	3.36		

Descriptive statistics for each TAM construct by gender group are presented in Table 4. Given that the data were non-normally distributed, as confirmed by the Kolmogorov-Smirnov test, median and interquartile ranges (IQR) are reported alongside means and standard deviations, consistent with recommended practice for nonparametric data (Field, 2009; Pallant, 2020).

As shown in Table 4, male students consistently obtained slightly higher mean and median scores than female students across all four TAM constructs. For PU, the median score for male students (Mdn = 17.00, IQR = 4.50) was one point higher than female students (Mdn = 16.00, IQR = 7.00). A similar pattern was observed for PEOU, where male students again obtained a higher median (Mdn = 17.00, IQR = 5.00) compared to female students (Mdn = 16.00, IQR = 8.00). For ATU, male students' median score (Mdn = 13.00, IQR = 3.00) was one point above that of female students (Mdn = 12.00, IQR = 6.00).

For BI, the median scores were identical across gender groups (Mdn = 12.00), with male students showing a slightly narrower IQR (IQR = 5.00) compared to female students (IQR = 6.00). Scores are described in terms of their observed distribution without categorical labels, as no externally validated scoring cutoffs were established for this instrument. The wider IQR values observed for female students across all constructs likely reflect the substantially larger female sample size ($n = 121$) relative to the male sample ($n = 35$), and should be interpreted as indicative of greater score spread rather than systematic differences in perceptions (Pallant, 2020).

Mann-Whitney U Test Results

To examine whether statistically significant gender differences existed in students' perceptions of MALL, the Mann-Whitney U test was conducted for each TAM construct and for overall perceptions. The rank distributions and test statistics are presented in Tables 5 and 6.

Table 5. Mann-Whitney U Test — Mean Ranks by Gender

Construct	Gender	N	Mean Rank	Sum of Ranks
Perceived Usefulness (PU)	Female	121	75.58	9145.00
	Male	35	88.60	3101.00
Perceived Ease of Use (PEOU)	Female	121	75.99	9195.00
	Male	35	87.17	3051.00
Attitude Toward Use (ATU)	Female	121	75.52	9138.50
	Male	35	88.79	3107.50
Behavioral Intention (BI)	Female	121	76.27	9229.00
	Male	35	86.20	3017.00
Overall Perceptions	Female	121	75.88	9181.00
	Male	35	87.57	3065.00

As shown in Table 5, male students consistently obtained higher mean ranks than female students across all four TAM constructs and in overall perceptions. However, whether these rank differences were statistically meaningful was determined through the Mann-Whitney U test statistics reported in Table 6.

Table 6. Mann-Whitney U Test Statistics

	PU	PEOU	ATU	BI	Overall Perceptions
Mann-Whitney <i>U</i>	1764.000	1814.000	1757.500	1848.000	1800.000
Wilcoxon <i>W</i>	9145.000	9195.000	9138.500	9229.000	9181.000
<i>Z</i>	-1.526	-1.307	-1.558	-1.166	-1.354
<i>p</i> (2-tailed)	.127	.191	.119	.244	.176
Effect Size <i>r</i>	.122	.105	.125	.093	.108

Effect sizes were calculated using the formula $r = Z / \sqrt{N}$ (Field, 2009), where *Z* is the standardized test statistic obtained from the Mann-Whitney output, and *N* is the total sample size of 156. The calculations are as follows: PU: $r = 1.526 / \sqrt{156} = 1.526 / 12.490 = .122$; PEOU: $r = 1.307 / \sqrt{156} = 1.307 / 12.490 = .105$; ATU: $r = 1.558 / \sqrt{156} = 1.558 / 12.490 = .125$; BI: $r = 1.166 / \sqrt{156} = 1.166 / 12.490 = .093$; Overall Perceptions: $r = 1.354 / \sqrt{156} = 1.354 / 12.490 = .108$. Absolute values are reported, as the negative sign of *Z* reflects only the direction of rank ordering between groups rather than the magnitude of the effect. According to (Cohen, 1988), $r = .10$ represents a small effect, $r = .30$ a medium effect, and $r = .50$ a large effect. All five effect size values fall below .13, indicating negligible to small effects across all constructs.

The Mann-Whitney U test results indicate that no statistically significant differences were found between male and female students on any of the four TAM constructs or in overall perceptions: PU, $U = 1,764.00$, $Z = 1.526$, $p = .127$, $r = .122$; PEOU, $U = 1,814.00$, $Z = 1.307$, $p = .191$, $r = .105$; ATU, $U = 1,757.50$, $Z = 1.558$, $p = .119$, $r = .125$; BI, $U = 1,848.00$, $Z = 1.166$, $p = .244$, $r = .093$; and overall perceptions, $U = 1,800.00$, $Z = 1.354$, $p = .176$, $r = .108$. All *p*-values exceeded the significance threshold of .05. Although male students across all constructs, as reflected in Table 4, these differences were not statistically meaningful. These results do not establish that the two groups are identical; rather, they indicate that no statistically detectable gender differences in MALL perceptions were found within this sample.

Given the considerable imbalance between gender groups in this study ($n = 121$ female, $n = 35$ male), the statistical power of the Mann-Whitney U test to detect small effects warrants consideration. Using the observed effect size of $r = .122$ and the actual sample sizes, a post-hoc power analysis conducted in G*power (Faul et al., 2009) indicated that the achieved statistical power was approximately .48, which falls below the conventionally recommended threshold of .80 (Cohen, 1988). This suggests that the study may have had insufficient power to detect small gender differences if they exist in the broader population.

4. Discussion

Gender Differences in Students' Perceptions of MALL Based on TAM

Perceived Usefulness (PU) and Perceived Ease of Use (PEOU)

The results of this study indicate that no statistically detectable gender differences were found in vocational high school students' perceptions of Mobile-Assisted Language Learning (MALL based on the Technology Acceptance Model (TAM). This finding applies consistently across all four constructs: Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Attitude Toward Use (ATU), and Behavioral Intention (BI). It should be noted, however, that the non-significant results do not establish that male and female students are identical in their perceptions; rather, they indicate that no statistically detectable differences were found within this particular sample.

The absence of significant gender differences in PU and PEOU is noteworthy in light of prior research. Several studies have reported gender as a moderating variable in technology acceptance, suggesting that male students sometimes exhibit stronger perceptions of usefulness while female students express greater concerns about ease of use (Ong & Lai, 2006; Pan et al., 2024). The descriptive data in the present study do reflect a similar directional tendency: male students consistently obtained slightly higher median scores than female students on PU (Mdn = 17.00 vs 16.00) and PEOU (Mdn = 17.00 vs 16.00). This pattern is consistent with what (Ong & Lai, 2006) observed in e-learning contexts, where male users tended to score higher on usefulness-related perceptions.

However, the magnitude of these differences was small ($r = .122$ for PU, $r = .105$ for PEOU), and none reached statistical significance. One contextual explanation for this contrast with studies reporting significant gender differences is that those studies were often conducted in settings where learners had more varied exposure to digital technology (Csizér & Albert, 2024; Liu et al., 2023). In the present study, both male and female students were enrolled in the same vocational programs, used the same curriculum materials, and were exposed to the same institutional environment, which may have reduced the conditions under which gender differences in PU and PEOU typically emerge.

It is also important to acknowledge that other learner-level variables may be more influential than gender in shaping TAM construct perceptions in this context. Factors such as prior MALL experience, digital competence, frequency of English application use, access to personal devices, socioeconomic background, and vocational major have been identified in the broader literature as potentially stronger predictors of technology acceptance than demographic characteristics such as gender (Ebadi & Raygan, 2023; Maranguni, 2019).

The present study did not measure these variables, which means that uncontrolled differences in prior experience or device access between individual students may have contributed to the observed score variability, particularly given the wider IQR values found for female students on PU (IQR = 7.00) and PEOU (IQR = 8.00). This interpretation is further supported by (Alhadijah, 2023) who found that EFL learners' perceptions of PU and PEOU were more strongly shaped by their frequency of mobile device use than gender, and by

(Ebadi & Raygan, 2023) similarly demonstrated that facilitating conditions and prior technology exposure were the primary predictors of PU and PEOU in MALL context.

Attitude Toward Use (ATU) and Behavioral Intention (BI)

The lack of significant gender differences in ATU and BI further suggests that both male and female students hold comparably positive affective and behavioral orientations toward MALL. This is consistent with the theoretical proposition in TAM that attitude and behavioral intention are primarily driven by PU and PEOU rather than by demographic characteristics (Davis, 1993; Venkatesh et al., 2000). Since PU and PEOU did not differ significantly by gender in this study, it follows logically that ATU and BI would also remain similar across groups.

This pattern is consistent with (Yang, 2025), who, in a gender-based multigroup analysis of EFL students' engagement in blended learning using both TAM and Self-Determination Theory, found no significant gender differences in the effects of perceived usefulness and perceived ease of use on active engagement. (Kemp et al. 2024) similarly found that demographic variables, including gender, had minimal explanatory power in extended TAM models applied to educational technology contexts.

(He & Li, 2023) further argued that students' continuance intention to use mobile learning platforms is primarily predicted by perceived usefulness and autonomous motivation, both of which were found to operate independently of gender in their study. Similarly, (Pan et al., 2024), in a study of Thai EFL students' behavioral intentions toward MALL, demonstrated that TAM constructs functioned as significant predictors of behavioral intention for learners of both genders, with no evidence that gender moderated these relationships.

Moreover, (Peng et al., 2023) demonstrated that TAM constructs, including attitude and behavioral intention, were more sensitive to the quality of mobile learning design than to learner demographic variables. Taken together, these findings suggest that when MALL tools are perceived as genuinely useful and easy to use, learners across gender groups tend to develop positive attitudes and intentions toward continued use, which appears to be the case in the present study context. It should be noted that TAM perceptions of this kind reflect students' self-reported cognitive and affective responses to MALL rather than actual language improvement or real usage behavior. Further studies should examine whether these positive perceptions translate into measurable gains in English proficiency or frequency of mobile application use.

Practical Implications

The effect sizes reported in this study, calculated as $r = Z / \sqrt{N}$ for the Mann-Whitney U test, were uniformly small across all constructs (r .903 to .125), indicating that any gender-related differences in students' perception of MALL, if they exist, would account for very little practical variance in this population. These findings carry practical implications for EFL teaching in vocational settings, with the caveat that the implications are specific to contexts similar to the one studied here and should not be generalized to all vocational EFL classrooms without replication. Rather than prioritizing gender-differentiated instruction, teachers in comparable contexts may find it more productive to focus on improving the overall quality and accessibility of MALL integration for all students.

This includes designing communicative tasks that explicitly connect mobile learning activities to students' vocational English needs, such as workplace conversation practice, job application writing, or industry-specific vocabulary development, so that the PU of MALL tools are made tangible and meaningful. Teachers should also ensure that students

receive adequate digital literacy support and technical orientation, particularly for learners who may have limited prior experience with educational applications, as access to devices and digital competence may be more influential drivers of MALL engagement than gender in this context (Ebadi & Raygan, 2023; Habib et al., 2022). Attention to learning outcomes should also accompany perceptions-based evaluations, as positive attitudes toward MALL do not automatically translate into improved language proficiency or sustained engagement with mobile learning tools outside the classroom.

The study was conducted at a single vocational high school where students shared the same EFL curriculum, classroom exposure to mobile learning tools, and comparable socioeconomic backgrounds. These shared contextual conditions may have further minimized the influence of gender on technology perception, a possibility raised by (Maranguni, 2019) in their discussion of situational variables in TAM-based research. (Aljasir & Arabia, 2023) similarly noted that when learners operate within the same instructional context, environmental consistency tends to reduce the predictive power of individual-difference variables such as gender. This contextual uniformity, while limiting the generalizability of findings, also underscores the importance of institutional environment as a mediating factor in technology acceptance.

However, several limitations of this study should be acknowledged. First, the convenience sampling from a single vocational school limits the external validity of the findings. Future research should replicate this study across multiple schools and regions to test whether the absence of gender differences holds in more diverse EFL contexts. Second, the study focused exclusively on perception-based TAM constructs and did not measure actual MALL usage behavior, which may be influenced by gender in ways that perceptions alone do not capture.

Future studies would benefit from examining additional learner variables, including prior MALL experience, digital literacy, vocational major, and frequency of English application use, as these may account for variance in TAM construct perceptions more substantially than gender. Multivariate or structural equation modeling approaches are also recommended to test the relationship among PU, PEOU, ATU, and BI as an integrated system, rather than comparing only group-level scores, so that the predictive pathways within the TAM framework can be examined in this vocational EFL population. Longitudinal designs and qualitative follow-up studies would also provide richer insight into the dynamics of gender and technology over time.

5. Conclusion

This study examined whether significant gender differences exist in vocational high school students' perceptions of MALL for English learning based on the TAM. Using a quantitative comparative survey design with 156 students from a vocational high school in South Jakarta, four TAM constructs, Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Attitude Toward Use (ATU), and Behavioral Intention (BI), were analyzed through Mann-Whitney U test results from 156 students at a vocational high school in South Jakarta.

The findings consistently showed no statistically significant differences between male and female students on any of the four constructs, with uniformly small effect sizes across all comparisons. These results suggest that, within this context, gender does not function as a meaningful differentiating factor in students' acceptance of MALL technology. Theoretically, this study contributes to the growing body of TAM-based MALL research by providing empirical evidence from an underrepresented population, vocational secondary EFL learners in Indonesia, and by demonstrating that the core TAM constructs operate similarly across gender groups when learners share comparable institutional exposure to mobile technology.

This challenges the assumption, prevalent in earlier educational technology research, that gender consistently moderates perceptions of technology, and instead aligns with more recent evidence suggesting that Generation Z learners' shared digital familiarity may be narrowing such differences (Al-qdah et al., 2025; Yang, 2025). Practically, the results indicate that MALL interventions in vocational EFL classrooms need not be differentiated by gender; instead, efforts may be directed toward strengthening students' overall perceptions of mobile learning tools across the classroom as a whole. Several limitations should be noted. The sample comprised 121 female and 35 male students, an imbalance that may have reduced the statistical power to detect subtle gender differences and limits the generalizability of the findings. Additionally, data were collected from a single vocational high school using convenience sampling, which restricts broader generalization to other EFL settings.

Future studies should replicate this investigation across multiple schools, regions, and educational levels to determine whether the absence of gender differences is consistent across broader EFL contexts, including comparisons between vocational and general secondary schools as well as higher education institutions. Researchers are also encouraged to incorporate actual usage behavior and learning outcomes alongside TAM constructs, as behavioral data would offer a more complete understanding of whether gender influences how students translate positive perceptions into practical MALL engagement.

The development and psychometric validation of a context-specific MALL instrument tailored to vocational EFL learners is further recommended, given that the adapted instrument used in this study was not originally designed for this population. Finally, longitudinal and mixed-methods approaches would provide a more dynamic and ecologically valid understanding of how gender interacts with contextual variables such as teaching pedagogy, peer influence, and institutional support for MALL over time.

6. Acknowledgment

The author would like to express her deepest gratitude to Dr. Ratih Novita Sari, as the supervisor whose guidance and constructive feedback were invaluable throughout the research and writing process. The author also wishes to thank her beloved father and mother for their unconditional love, prayers, and endless encouragement throughout her academic journey. Sincere appreciation is also extended to Silih Warni, Ph.D., as Head of the English Language Education Study Program, and to all lecturers at the University of Muhammadiyah Prof. Dr. HAMKA for their knowledge and dedication. The author is equally grateful to the headmaster of the participating vocational high school and to all students who willingly participated as respondents. Heartfelt thanks to all friends whose companionship and support have been a constant source of strength throughout this research.

7. References

- Abdulaziz, H., Hassan, A., & Mahdi, S. (2021). Measuring Students' Use of Zoom Application in Language Course Based on the Technology Acceptance Model (TAM). *Journal of Psycholinguistic Research*, 50(4), 883–900. <https://doi.org/10.1007/s10936-020-09752-1>
- Al-qdah, M., Alanezi, S., & Alyami, E. (2025). Gender Differences in E-Learning Tool Usage Among University Faculty Members in Saudi Arabia Post-COVID-19. *MDPI*, 5(5), 1–15.
- Alhadijah, A. (2023). *Undergraduate EFL Learners' Use and Acceptance of Mobile -Assisted Language Learning: A Structural Equation Modeling Approach*. 13(3), 253–264. <https://doi.org/10.5430/wjel.v13n3p253>

- Aljasir, N., & Arabia, S. (2023). Perceptions of Self-Learners of English Toward Mobile Language Learning: Technology Acceptance Model and Constructivist Learning Theory Perspectives. *International Journal of Computer-Assisted Language Learning and Teaching*, 13(1), 1–25. <https://doi.org/10.4018/IJCALLT.334599>
- Barz, N., Benick, M., Dörrenbächer, L., & Franziska, U. (2024). Students' acceptance of e-learning: extending the technology acceptance model with self-regulated learning and affinity for technology. *Discover Education*. <https://doi.org/10.1007/s44217-024-00195-7>
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences - 2nd ed.* Lawrence Erlbaum Associates.
- Csizér, K., & Albert, Á. (2024). Gender - Related Differences in the Effects of Motivation, Self-Efficacy, and Emotions on Autonomous Use of Technology in Second Language Learning. *The Asia-Pacific Education Researcher*, 33(4), 819–828. <https://doi.org/10.1007/s40299-023-00808-z>
- Davis, F. D. (1993). *Davis_User acceptance of information technology.pdf*. Academic Press Limited. <https://doi.org/10.1006/imms.1993.1022>
- Davis, F. D. (2014). Information Technology Introduction. *MIS Quarterly*, 13(3), 319–340. <http://www.jstor.org/stable/249008?origin=JSTOR-pdf>
- Ebadi, S., & Raygan, A. (2023). Investigating the facilitating conditions, perceived ease of use and usefulness of mobile-assisted language learning. *Smart Learning Environments*. <https://doi.org/10.1186/s40561-023-00250-0>
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: *Behavior Research Methods*, 41(4), 1149–1160. <https://doi.org/10.3758/BRM.41.4.1149>
- Field, A. (2009). *Andy field*. SAGE Publications Ltd.
- García, G. (2018). *Acceptance and usage of mobile assisted language learning by higher education students*. <https://doi.org/10.1007/s12528-018-9177-1>
- Habib, S., Haider, A., Sufyan, S., Suleman, M., & Akmal, S. (2022). *Mobile Assisted Language Learning: Evaluation of Accessibility, Adoption, and Perceived Outcome among Students of Higher Education*.
- He, L., & Li, C. (2023). *Continuance intention to use mobile learning for second language acquisition based on the technology acceptance model and self-determination theory*. *June*, 1–11. <https://doi.org/10.3389/fpsyg.2023.1185851>
- Karakoyun, F., & Başaran, B. (2024). *Profiling University Students' Technology Acceptance Through UTAUT*. 12(2), 78–92.
- Kemp, A., Palmer, E., & Thompson, H. M. (2024). *Testing a novel extended educational technology acceptance model using student attitudes towards virtual classrooms*. *August 2023*, 2110–2131. <https://doi.org/10.1111/bjet.13440>
- Linus, A. A., Aladesusi, G. A., Monsur, I. A., & Elizabeth, F. J. (2025). *Perceived Usefulness, Ease of Use, And Intention to Utilize Online Tools for Learning Among College of Education Students*. 5(1), 41–52.
- Liu, L., Kasuma, S. A. A., & Lah, S. C. (2023). The Impact of Mobile Resources on Enhancing Lifelong Learning Among Chinese Undergraduate EFL Students: *International Journal of Virtual and Personal Learning Environments*, 13(1), 1–18. <https://doi.org/10.4018/IJVPLE.331081>
- Maranguni, N. (2019). *Technology acceptance model in educational context: A systematic literature review*. 0(0). <https://doi.org/10.1111/bjet.12864>
- Ong, C., & Lai, J. (2006). *Gender differences in perceptions and relationships among dominants of e-learning acceptance*. 22, 816–829. <https://doi.org/10.1016/j.chb.2004.03.006>
- Pallant, J. (2020). *For the SPSS Survival Manual website, go to*. Routledge.

- Pan, L., Ye, Y., & Li, X. (2024). *Factors affecting Thai EFL students ' behavioral intentions toward mobile-assisted language learning*. February, 1–14. <https://doi.org/10.3389/feduc.2024.1333771>
- Peng, M. Y., Xu, Y., & Xu, C. (2023). Heliyon Enhancing students ' English language learning via M-learning : Integrating technology acceptance model and S-O-R model. *Heliyon*, 9(2), e13302. <https://doi.org/10.1016/j.heliyon.2023.e13302>
- Rodríguez-Arce, J., Vázquez-Cano, E., Cobá Juárez-Pegueros, J. P., & González-García, S. (2023). Comparison of Learning Content Representations to Improve L2 Vocabulary Acquisition Using m-learning. *SAGE Open*, 13(4), 1–15. <https://doi.org/10.1177/21582440231216819>
- Skarpaas, K. G., & Hellekjær, G. O. (2021). International Journal of Educational Research Open Vocational orientation – A supportive approach to teaching L2 English in upper secondary school vocational programmes. *International Journal of Educational Research Open*, 2(July), 100064. <https://doi.org/10.1016/j.ijedro.2021.100064>
- Taber, K. S. (2018). *The Use of Cronbach ' s Alpha When Developing and Reporting Research Instruments in Science Education*. 1273–1296. <https://doi.org/10.1007/s11165-016-9602-2>
- Venkatesh, V., Davis, F. D., & Studies, F. (2000). *A Theoretical Extension of the Technology Acceptance Model : Four Longitudinal*. May 2014.
- Weng, F., Yang, R., Ho, H., & Su, H. (2018). *A TAM-Based Study of the Attitude towards Use Intention of Multimedia among School Teachers*. <https://doi.org/10.3390/asi1030036>
- Yang, Y. (2025). *Factors Influencing the Active Engagement of Undergraduate EFL Students in Blended Learning : A Gender-Based Multigroup Analysis*. June, 1–21. <https://doi.org/10.1177/21582440251336512>
- Yuan, Y., Harun, J. B., & Wang, Z. (2023). The Effects of Mobile-Assisted Collaborative Language Learning on EFL Students ' Interpreting Competence and Motivation. *International Journal of Computer-Assisted Language Learning and Teaching*, 13(1), 1–19. <https://doi.org/10.4018/IJCALLT.332404>