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The Impact of Mobile-Based E-Muḥādathaṯ on Arabic Learners' Willingness to Communicate in Higher Education

Siti Rahmah Borham[1], Saipolbarin Ramli[1,*], Mohammad Taufiq Abdul Ghani[1]

[1] Jabatan Bahasa Moden, Fakulti Bahasa dan Komunikasi, Universiti Pendidikan Sultan Idris, 32610 Tanjong Malim, Perak, Malaysia

ABSTRACT

The efficacy of educational applications in fostering student learning is contingent on several critical factors, including content accuracy, operational precision, student engagement, user-friendliness, and the promotion of learning motivation. Despite the proliferation of educational mobile applications on platforms such as the Google Play Store and Apple Store, a significant proportion fall short of these standards, often exhibiting deficiencies in meeting user needs and compromising learning outcomes due to technical and linguistic errors. To address this gap, this study aimed to evaluate the effectiveness of the E-Muḥādathaṯ kit, an Android-based mobile application designed to enhance Arabic language communication skills among university students. A quasi-experimental research design was employed to compare the outcomes of students from the Faculty of Languages and Communication at Sultan Idris University of Education. Participants were randomly assigned to either an experimental group that utilized the E-Muḥādathaṯ kit (n=18) or a control group that received traditional instruction (n=16). Student achievement was measured using pre and post-tests evaluated through a rubric, while participant perceptions were gathered via open-ended questions. The results of this study demonstrate the potential of mobile learning to significantly enhance Arabic learners' willingness to communicate in higher education, which revealed a significant difference in post-test scores between the experimental and control groups ($p = 0.000$, $p < 0.05$). Furthermore, the E-Muḥādathaṯ kit was perceived positively by students as a motivational tool. These results underscore the need for further research to develop innovative, student-centred pedagogical approaches that leverage the potential of mobile technology to optimize Arabic language proficiency among non-native speakers in Malaysian higher education.

Keywords:
E-Muḥādathaṯ; mobile learning; willingness to communicate; teaching and learning; non-Arabic speakers

1. Introduction

The convergence of technology and education has ushered in a new era characterized by the integration of science, technology, and innovation (STI). Malaysia's higher education landscape reflects this global trend through the adoption of various educational innovations. Mobile learning, a pedagogical approach leveraging the capabilities of mobile devices, has emerged as a promising strategy to enhance student engagement and academic performance. Within this context, Arabic

* *Corresponding author.*
E-mail address: saipolbarin@fbk.upsi.edu.my

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language instruction in Malaysia aims to cultivate proficiency in all four language skills: listening, speaking, reading, and writing. However, the current curriculum places a disproportionate emphasis on oral skills, aligning with the communicative nature of the language. While the development of authentic communicative competence is a cornerstone of second language acquisition was emphasized by MacIntyre *et al.,* [1] studies, challenges persist in achieving Arabic language proficiency among Malaysian university students. Factors such as language anxiety, speaking apprehension limited vocabulary, and low self-confidence contribute to this issue as discussed by Zaharuddin *et al.,* [2] and Raffi *et al.,* [3] in their papers.

Willingness to Communicate (WTC), a crucial component in successful second language acquisition has been a focal point of language acquisition research was articulated by McCroskey and Baer [4] studies. Encompassing an individual's inclination to engage in communicative interactions utilizing a target language, WTC is a complex construct influenced by a confluence of psychological, situational, and environmental factors. Psychological factors, such as personality, communication confidence, and motivation, in conjunction with situational and environmental variables, exert a significant impact on WTC. Consequently, sustained efforts are required to enhance students' WTC by addressing psychological, situational, and environmental factors to optimize learning outcomes. The digital environment significantly influences WTC by providing a context that mitigates language anxiety and bolsters students' communicative confidence, and ultimately foster WTC, as highlighted by Ayedoun *et al.,* [5] studies.

Recent research has consistently demonstrated the efficacy of digital environments in enhancing WTC. Scholars have focused on developing a range of language learning applications, software, and innovative products to cultivate WTC. These initiatives encompass diverse approaches as research by Fathi *et al.,* [6] discussed the role of Artificial Intelligence (AI)-mediated learning such as chatbots, informal digital learning of English (IDLE) as conducted by Zadorozhnyy and Lee [7] studies, and digital communication activities as conducted by Han *et al.,* [8] studies. Moreover, research indicates that the digital environment positively impacts student engagement, learning motivation, and WTC. For instance, previous studies taken from Wu and Hung [9], discussed on educational innovations like Cospaces VR-based learning, Ebadi and Ebadijalal [10] discussed on Google Expedition virtual reality (VR), Ayedoun *et al.,* [5] discussed on AI-based conversational agents, and Fan [11] discussed on flipped classrooms that demonstrated significant improvements in students' WTC for second and foreign language learning. Furthermore, the role of mobile learning in enhancing students' WTC has garnered increasing attention. Studies have explored the development of mobile game applications as emphasized by Bakar *et al.,* [12] studies, the employment of mobile applications in English language learning for vocational students by Mulyawan and Resmayani [13] studies, and the utilization of Duolingo Apps by Sakkir and Syamsuddin [14] studies, that influenced on students' WTC among non-native speakers.

1.1 Mobile Application for Language Learning

Mobile learning or Mobile-Assisted Language Learning (MALL) represents a contemporary pedagogical approach that leverages the capabilities of mobile devices to facilitate language acquisition. By integrating applications, websites, and educational software, MALL offers a flexible and accessible learning environment. This modality offers numerous advantages, including accessibility, flexibility, and opportunities for interactive engagement, as highlighted by Nuraeni *et al.,* [15] and Mohd Raffi *et al.,* [16] in their papers. In the context of Arabic language education, MALL offers a promising avenue for enhancing learners' proficiency and engagement. In contrast to traditional classroom instruction, MALL empowers learners to access educational resources and

engage in language practice at their own pace and convenience. The potential of MALL to create student-centred and interactive learning experiences has been widely acknowledged as explained by Yahaya *et al.,* [17] studies. The ubiquitous nature of mobile devices, coupled with their advanced functionalities, has contributed to the rapid adoption of MALL in educational contexts. Furthermore, the integration of multimedia elements within mobile applications has been shown to enhance learner motivation, engagement, and overall learning outcomes.

Compared to traditional learning, Mobile Assisted Language Learning (MALL) offers the ability to follow language lessons and access learning materials via smartphones, tablets, iPads, and other devices, rather than being confined to the classroom or computer lab. With internet access, these mobile devices provide benefits such as easy access to learning resources, flexible learning opportunities anytime and anywhere, global communication with teachers and peers, user-friendliness, and affordability as highlighted by Busaeri *et al.,* [18] research. Furthermore, the integration of multimedia elements within mobile applications has been shown to be particularly effective in enhancing Arabic language learning, as noted by Alharizeh and Khasawneh [19], Noor *et al.,* [20], and Ghani *et al.*, [21] studies. By incorporating visual, auditory, and interactive features, MALL can accommodate diverse learner styles and preferences.

Furthermore, the use of authentic language materials and real-world contexts can bridge the gap between classroom instruction and real-life language use, thereby improving learners' communicative competence. Previous research has consistently underscored the positive correlation between mobile learning and WTC in second and foreign language contexts. However, a notable gap exists in the literature regarding the application of this pedagogical approach to Arabic language acquisition. While a plethora of language learning applications are accessible through digital marketplaces, their effectiveness in meeting the specific needs of Arabic learners is often compromised by technical deficiencies, grammatical inaccuracies, and an inability to sustain learner engagement. These limitations necessitate innovative mobile learning solutions as highlighted by Koderi *et al.,* [22] research. This study aims to contribute to this field by investigating the impact of the mobile-based E-Muḥādathaṯ on Arabic learners' WTC within a higher education setting.

2. Methodology

2.1 Research Design

A mixed-methods paradigm was adopted to investigate the impact of the E-Muḥādathaṯ kit on UPSI students' WTC. This methodological framework integrates quantitative and qualitative research to afford a comprehensive elucidation of the phenomenon was stated by Creswell *et al.,* [23] studies. A quasi-experimental design, initiated with quantitative measurements, was employed to assess the kit's efficacy. To enrich the understanding of user experiences, qualitative data were collected to contextualize and corroborate the quantitative results as highlighted by Bowen [24] in his paper. Both methodological approaches were congruent with the study's aim of evaluating the E-Muḥādathaṯ kit's impact on Arabic WTC among Sultan Idris University of Education (UPSI) students in Malaysia. Moreover, the E-Muḥādathaṯ kit was developed through the application of the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) model and evaluated via a pre-post quasi-experimental design encompassing a control and experimental group was described by Elsayed [25] research. In general, mixed-methods yield a more robust comprehension than either quantitative or qualitative methodologies independently as posited by Morse [26], Tezer and Çimşir [27] studies. Through data triangulation, this research provides a comprehensive assessment of the E-Muḥādathaṯ kit's impact on students' WTC.

2.2 Research Context

A mixed-methods approach was employed in the Arabic Skills Course during the second semester of the 2022/2023 academic year to address the research questions. A quasi-experimental design was implemented, involving a control group and an experimental group taught by the researchers, as outlined in the studies of Al-Qatawneh *et al.,* [28] and Hermawan *et al.,* [29]. Guided by an ADDIE instructional design model, the course was enriched with engaging and interactive elements such as app-based tools, quizzes, gamification platforms, social media, online dictionaries, and group activities, while maintaining the core course objectives. Dialogue simulation modules covering greetings, introductions, question-asking, social interactions, requests, directions, shopping, and career-related scenarios were integrated into the curriculum. The E-Muḥādathaṯ kit or mobile application was employed to deliver the course content to Android smartphones for the experimental group. These students engaged in mobile learning guided by the ADDIE instructional design model. Conversely, the control group followed traditional learning methods within a classroom and computer lab environment. Both groups were exposed to the same course content.

2.3 Participants

The study population comprised first-year students enrolled in an Arabic Skills course at UPSI. A total of 34 undergraduate students, voluntarily participating in the research, were recruited from the Arabic Languages Department. Employing random sampling as outlined by Creswell *et al.,* [23] studies, participants were divided into experimental (n=18) and control (n=16) groups. Table 1 show that the majority of participants (73.5%) were female, while 26.5% were male. All participants were enrolled in the Arabic Language Undergraduate Program (PISM) with an Education specialization at UPSI. Additionally, all participants were first-year students. Regarding prior Arabic language education, 94.12% possessed either a Malaysian Higher Religious Certificate (STAM) or a Malaysian Higher School Certificate (STPM), while 2.94% held a Malaysian Certificate of Education (SPM) and 2.94% possessed a diploma. The research participants were assigned into two groups: a control group with 47.1% (n=16) and an experimental group with 52.9% (n=18). Participants in the experimental group were required to provide feedback on their mobile app learning experiences.

Table 1
Participants Demographic Data

Demographic	Frequency	Percentage (%)
1. Gender		
Male	9	26.5
Female	25	73.5
Total	34	100
2. Program		
PISM with Education, UPSI	34	100
Total	34	100
3. Year of Study		
One	34	100
Total	34	100
4. Level of Study		
STAM	1	2.94
STPM	32	94.12
Diploma	1	2.94
Total	100	100
5. Group		
Control	16	47.1
Experimental	18	52.9
Total	34	100

2.4 Study Procedure

A quasi-experimental research design was employed to investigate the efficacy of mobile learning in enhancing Arabic students' WTC. Two cohorts of Arabic Skills students were randomly assigned to either a control or experimental group. At the start of the course, the students in the experimental and control groups were given a pre-test for their WTC achievement via Google Forms. Pre- and post-intervention assessments of WTC were administered to both groups using a standardized rubric. Over a four-week intervention period, the control group received traditional instruction, encompassing lectures, PowerPoint presentations, and instructional videos delivered within a classroom environment. In contrast, the experimental group participated in a mobile-friendly, interactive course facilitated by the E-Muḥādathaṯ platform. Both groups were furnished with the course's lecture notes. Subsequent to the four-week intervention, a post-test was similarly administered to assess WTC outcomes.

2.5 Data Collection Tools
2.5.1 Pre-test and post-test

A pre-test was administered to all 34 participants prior to the intervention as a quantitative measure within the quasi-experimental design. The pre-test was conveniently and cost-effectively distributed online to both the control and experimental groups, aligning studies in Zainon and Yaakub [30], Zaini and Shari [31]**.** To ensure validity, the pre-test underwent a rigorous development process involving translation, face and content validation by Arabic language experts, and reliability testing. A pilot study was conducted on 30 participants from the PISM Arabic Language Studies program at Sultan Zainal Abidin University (UniSZA) to assess the pre-test and post-test equivalence and reliability. Pearson's correlation coefficient was employed to evaluate instrument reliability, as outlined by Schober *et al.,* [32] research**.**

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}} \quad (1)$$

Based on the Pearson correlation coefficient formula, 'r' refers to the Pearson correlation coefficient, 'n' is the number of pre-test and post-test samples, 'x' is the pre-test score, 'y' means the post-test score and 'xy' means the score result of the two pre-tests and post-test. The Pearson correlation coefficient 'r' was employed to determine the relationship between pre-test and post-test WTC scores. The coefficient ranges from -1 to 1 ($-1 \leq r \leq 1$), with values closer to 1 indicating a strong positive correlation. A significance level of $p < 0.05$ (two-tailed) was adopted, with $p < 0.01$ indicating a highly significant correlation, as outlined by Schober *et al.,* [32] research**.** Hence, a correlation analysis of the pre-test and post-test scores for the 30 participants (n=30) revealed a strong positive correlation (r=0.85, p<0.001). This indicates a high degree of reliability between the two measures and supports their suitability for further analysis. Consequently, the pre-test and post-test were employed to assess the impact of the E-Muḥādathaṯ kit on students' WTC in Arabic under varying teaching methods. Hypotheses were formulated as follows:

i. H_{01}: There is no significant difference between the pre-test scores of students in control group (traditional method) and treatment group (the E-Muḥādathaṯ kit)
ii. H_{02}: There is no significant difference between pre-test and post-test scores of students in control group (traditional method).
iii. H_{03}: There is no significant difference between pre-test and post-test scores of students in treatment group (the E-Muḥādathaṯ kit).
iv. H_{04}: There is no significant difference between the post-test scores of students in treatment group (the E-Muḥādathaṯ kit) and control group (traditional method).

2.5.2 Open-ended question

Qualitative feedback on the user experience of the E-Muḥādathaṯ kit was collected from participants in the experimental group to complement the quantitative data. An open-ended questionnaire was employed to elicit detailed responses regarding their interactions with the mobile application. This instrument was adapted from previous studies conducted by Zainuddin and Sahrir [33] and Ghani *et al.,* [21]. To ensure the validity and reliability of the questionnaire, a panel of three experts was convened. These experts possessed specialized knowledge in teaching Arabic as a second language, instructional design and technology, and Arabic translation. Their expertise was leveraged to conduct a rigorous face and content validity assessment of the instrument. Following this validation process, the questionnaire was administered to the experimental group, prompting participants to share their experiences, opinions, and suggestions concerning the E-Muḥādathaṯ kit.

2.6 Data Analysis

Data analysis was conducted using IBM SPSS Statistics version 27. Prior to analysis, data cleaning and screening procedures were implemented to ensure data accuracy, normality, and the identification of missing values or outliers, following the guidelines by Maric *et al.,* [34] studies. Descriptive statistics and inferential t-tests were employed for data analysis. Descriptive statistics were utilized to characterize the demographic profile of the participants as explained by Mowbray *et al.,* [35] studies, including gender, PISM program, year of study, secondary-level Arabic language

education, and Arabic Skills (KBA) course enrolment. Frequency analysis and percentages were calculated for these variables using IBM SPSS Statistics version 27.

Other than that, to examine group differences in WTC, independent-samples t-tests were conducted to compare the control and experimental groups. Paired-samples t-tests were employed to assess changes in WTC scores between pre- and post-tests within each group. While independent-samples t-tests were utilized to determine if significant differences existed in WTC achievement between the control and experimental groups. This analysis aimed to evaluate the overall effectiveness of the E-Muḥādathaṯ kit in enhancing students' WTC compared to traditional instruction. Moreover, paired-samples t-tests were conducted to compare pre- and post-test WTC scores within each group, allowing for an assessment of within-group changes in WTC. This analysis provided evidence for the efficacy of the intervention in improving students' WTC over time. In addition to quantitative analysis, thematic analysis was employed to explore qualitative feedback on the E-Muḥādathaṯ kit derived from open-ended responses. This approach allowed for a deeper understanding of students' experiences and perceptions of the mobile application.

3. Results

3.1 The Impact of the E-Muḥādathaṯ Kit on Students' WTC

The following section presents the findings of the quasi-experimental study, examining the efficacy of the E-Muhadathat kit in enhancing students' WTC in Arabic. The study sought to determine the impact of the kit on students' WTC performance by comparing the outcomes of the experimental group, which utilized the mobile application, to those of the control group, which received traditional instruction. The results of these comparisons are detailed in the subsequent subsections.

3.1.1 Students' WTC achievement with different teaching methods

The difference in WTC achievement of Arabic students in the control group and the treatment group is obtained based on the null hypothesis that is rejected or cannot be rejected. The null hypothesis is rejected if the study findings show a significant value (p) less than 0.05 ($p<0.05$). However, if the significant value (p) is greater than 0.05 ($p>0.05$), then the null hypothesis cannot be rejected. Therefore, the t-test for independent samples (Independent-Samples T-Test) is used to identify if there is a significant difference between the pre-test scores of participants in control group (traditional methods) and participants in treatment group (the E-Muḥādathaṯ kit).

Table 2 presents the results of the (Independent-Samples T-Test) comparing pre-test scores between the control group (N = 16, M = 74.81, SD = 9.268) and the experimental group (N = 18, M = 76.83, SD = 11.372). The findings indicate no significant difference in pre-test scores between the two groups, with ($t = -0.563$, $p = 0.577$, $p > 0.05$). Consequently, the null hypothesis of no difference in pre-test scores between the control and experimental groups cannot be rejected. The detailed findings are presented in Table 2 below.

Table 2
The difference of pre-test scores in two groups

Score	Group	N	M	SD	t	p
Pre-Test	Control	16	74.81	9.268	-0.563	0.577
	Experimental	18	76.83	11.372		

In addition, a (Paired-Samples T-Test) was conducted to compare pre- and post-test scores, as well as to assess changes in WTC within the control group. Table 3 presents the results of the (Paired-

Samples T-Test) conducted on the pre-test and post-test scores of the control group (N = 16). The mean pre-test score was 74.81 (SD = 9.268), and the mean post-test score was 70.81 (SD = 6.685). The t-test results indicate no significant difference between the pre-test and post-test scores (t = 1.982, p = 0.066, p > 0.05). Consequently, the null hypothesis of no difference in pre- and post-test scores for the control group could not be rejected.

Table 3
The difference of pre-test and post-test scores in control group

Score	Group	N	M	SD	t	p
Pre-Test	Control	16	74.81	9.268	1.982	0.066
Post-Test	Control	16	70.81	6.685		

A (Paired-Samples T-Test) was conducted to assess changes in WTC within the experimental group. Table 4 presents the results of the (Paired-Samples T-Test) conducted on the pre-test and post-test scores of the experimental group (N = 18). The mean pre-test score was 74.83 (SD = 11.372), and the mean post-test score was 86.39 (SD = 7.678). The t-test results indicate a significant difference between the pre-test and post-test scores (t = -4.110, p = 0.001, p < 0.05). This finding supports the rejection of the null hypothesis, indicating a significant difference in pre- and post-test scores for the experimental group. The detailed findings are presented in Table 4 below.

Table 4
The difference of pre-test and post-test scores in experimental group

Score	Group	N	M	SD	t	p
Pre-Test	Experimental	18	74.83	11.372	-4.110	0.001
Post-Test	Experimental	18	86.39	7.678		

Furthermore, to compare post-test WTC scores between the experimental and control groups, an (Independent-Samples T-Test) was conducted. Results indicate a significant difference in post-test scores, with the experimental group (N = 18, M = 86.39, SD = 7.678) outperforming the control group (N = 16, M = 70.81, SD = 6.685), with the t and p value (t = -6.270, p = 0.000, p < 0.05). These findings support the rejection of the null hypothesis, indicating a significant difference in post-test scores for the control group and experimental group. Detailed results are presented in Table 5.

Table 5
The difference of post-test scores in two groups

Score	Group	N	M	SD	t	p
Post-Test	Control	16	70.81	6.685	-6.270	0.000
Post-Test	Experimental	18	86.39	7.678		

3.1.1 The user experience of the E-Muḥādathaṯ kit

Participant feedback on the E-Muḥādathaṯ kit was predominantly positive. Qualitative analysis revealed three primary themes: learning content, text and audio quality, and overall application evaluation. Regarding learning content, participants expressed a range of opinions. While some found the E-Tamrīn exercises engaging and beneficial for consolidating Arabic language knowledge, others suggested augmenting the quantity and diversity of questions. Specific recommendations included the integration of questions that comprehensively assess all language skills. With respect to text and audio quality, minor technical issues with audio playback were reported. Overall, participants expressed satisfaction with the application, emphasizing its utility, informative content,

and suitability for Arabic language practice. Table 6 provides a detailed summary of the thematic analysis conducted on participant feedback regarding the E-Muḥādathaṯ kit user experience.

Table 6
Participants' Feedback on the E-Muḥādathaṯ kit

Item	Comments	Suggestions
Learning Content	1. There are some E-Tamrīn questions that are not clear. 2. E-Tamrīn questions are not enough. 3. E-Tamrīn questions were interesting. 4. The questions in E-Tamrīn are very good. 5. The module content effectively reinforces students' Arabic language skills. 6. The module provides valuable resources to enhance students' Arabic language proficiency. 7. Content optimally aligned with the linguistic needs and interests of adolescent learners to foster Arabic language development.	1. Please add E-Tamrīn questions. 2. Please add more E-Tamrīn questions. 3. Please add questions covering all skills (listening, reading & writing).
Text and Audio Quality	1. Some audio files are experiencing playback issues. 2. Audio playback errors are occurring in some instances.	1. Please rectify the audio issue.
App Overview	1. The application is very useful for learning Arabic. 2. Very good app, especially E-Qāmūs for online dictionary feature. 3. Many inputs are obtained in the application. 4. The application employs simplified sentence structures to facilitate Arabic language acquisition for learners. 5. Suitable for practicing Arabic.	

4. Conclusions

The findings of this study compellingly demonstrate that integrating the E-Muḥādathaṯ kit or mobile application into Arabic language instruction significantly enhances students' WTC in Arabic. This conclusion is supported by the results of a hypothesis test, which revealed a significant difference in post-test scores between the experimental and control groups ($p = 0.000$, $p < 0.05$). The data indicates that the E-Muḥādathaṯ kit significantly outperformed traditional instruction in improving students' WTC in Arabic. Furthermore, user feedback on the E-Muḥādathaṯ kit was overwhelmingly positive. Qualitative analysis revealed three primary themes: learning content, text and audio quality, and overall application evaluation. While participants generally found the E-Tamrīn

exercises engaging and beneficial for reinforcing Arabic language knowledge, some suggested expanding the question bank for greater breadth. Minor technical issues with audio playback were reported. Nevertheless, participants expressed overall satisfaction with the application, highlighting its utility, informative content, and suitability for Arabic language practice. To further advance this research, several avenues for future exploration are suggested. Firstly, expanding the app's accessibility to include an iPhone version would broaden its reach to a wider audience. Secondly, expanding the study population to encompass PISM students of Islamic Studies and Arabic language educators would provide valuable insights into the app's applicability across different user groups. Thirdly, diversifying data collection methods through post-intervention interviews would enrich the understanding of user experiences. Finally, exploring the integration of emerging technologies such as AI, VR, Augmented Reality (AR), interactive multimedia and online platforms within Arabic language learning and communication practices presents exciting opportunities for future research. This comprehensive approach will contribute to the ongoing development of effective mobile learning solutions for enhancing Arabic language proficiency and communication skills.

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