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THE IMPACT OF MOBILE-ASSISTED HYBRID DYNAMIC ASSESSMENT ON ARABIC LANGUAGE LEANERS' READING COMPREHENSION PERFORMANCE

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Abstract

Dynamic assessment is unity of assessment and instruction based on the sociocultural theory in which mediation is gradually provided to promote the cognitive development. This study mainly aimed to explore the quantitative and qualitative impact of mobile-assisted hybrid dynamic assessment (MAHDA) on Islamic religious Education (IRE) learners' Arabic reading comprehension (ARC). This recent study employed a sequential explanatory mixed-methods design and involved twenty participants assigned into experimental and control groups. All groups received pre-and post-tests to compare the intervention. The experimental group was mediated through the MAHDA procedure for two months and the control group received conventional instruction. The interview with the participants was also conducted to assess the learners' perception of the mediation strategies of MAHDA. The pre- and post-test were analyzed by t-test and the transcribed interviews were thematically analyzed. Quantitatively, the results showed a meaningful distinction between the two groups. It highlighted that MAHDA was significantly effective to enhance the learners' knowledge of ARC. The qualitative findings also indicated that the participants felt satisfied with the MAHDA in improving the learners' ARC abilities and social interaction. One of the implications of this research is to promote the use of mobile learning as mediation DA framework to teach various features of Arabic including reading comprehension of Arabic. Further research is required MAHDA with a larger site and samples to generate the effectiveness of MAHDA.

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INTRODUCTION

Arabic reading skill (qirā'ah) plays very essential role in the Islamic academic world, especially at the Islamic higher education. It is the key to acquire new knowledge or sciences (Aynalem & Tesmand, 2023) through interaction with Arabic texts or literature. There are two dimensions of reading skills, reading aloud (*al-qirā'ah aljahriyyah*) and reading silently (*al-qirā'ah ash-shāmitah*). *Al-qirā'ah aljahriyyah* refers to the ability to respond to Arabic orthographic (writing or symbols) through identifying, pronouncing or pronouncing it (al-Zaiyat, 1998; Munip, 2017; Qasim and Fadl, 2014). On the other hands, *al-qirā'ah ash-shāmitah* skill is reading (silent) skills from a mental aspect, namely the capability to understand the meaning of written texts (it is also called *fahmūl maqrū'*) (Munip, 2017). Given these dimensions, teaching reading comprehension is a complex process of gaining knowledge (Perfetti & Stafura, 2014). In many Indonesian Islamic higher education institutions, ARC is provided to foster learner's receptive competence, to increase their motivation and self-regulation of language learning, and help them develop strategic abilities to apply their language

knowledge to understand academic texts or literature for their career needs. Thus, some scholars also claim that successful academic career is determined by reading comprehension (Jennifer, Lindsey, and Ulana, 2010). Meanwhile, the research studies exploring the issue of learners' ability to read comprehension has been very little discussed much to date. Moreover, the teaching and learning process in promoting ARC abilities in higher education has also not widely investigated.

This paper provides the leaners' prior abilities and the the impact of mobile-assisted hybrid dynamic assessment (MAHDA) procedure to promote the cognitive development on ARC of Islamic higher education institutions in Indonesia, especially Pontianak. MAHDA is an acronym used in this study which is embedded from several theories or concepts, mobile-assisted language learning (MALL), and hybrid dyanamic assessment (HDA). Mobile learning facilates the learners to learn both ouside the classroom (Ally, 2013) and develop interaction with the learning materials from anywhere (Fernández-López et al., 2013). Meanwhile, DA is rooted in Vygotsky's sociocultural theory (SCT) with the concept of the zone of proximal development (ZPD) (Vygotsky, 1978) in which the interaction between teacher or more competent learners are met to improve learners' cognitive development (Poehner 2008a; Poehner 2008b; Poehner and Lantolf 2013). With this in mind, some scholar argues this interaction could enhance the leaners learning potential (Yang & Qian, 2019). Recently, DA has been globally applied with mobile technology in foreign language assessment, for instance, English. There have been some research studies that have proved the effectiveness of mobile-based DA (MDA) in enhancing language learning potential (Andujar, 2020; Ebadi and Bashir 2020; Tarighat and Khodabakhsh, 2016; Moeinpour, Nasiri, Pineh, & Davarpanah, 2019; Rassaei, 2023; Rezaee, Alavi, & Razzaghifard, 2019; Kaveh & Rassaei, 2022).

Andujar (2020) implemented MDA through mobile instant messaging (MIM) (WhatsApp application) to enhance grammar and vocabulary skills. In his study, the experimental and control groups received the traditional assessment (pre-and post-test). The data were collected and analyzed from open-ended dialogue with the experimental group to assist the learning and identify the pedagogical MDA. During the DA session, the mediation moves were applied the implicit-to-most explicit prompts. The findings indicated that MDA was effective in improving the performance and the potential learning of the experimental group. On the other hand, another study also showed that text-based meditation and WhatsApp helped learners to better compose academic writing skills (Ebadi and Bashir 2020). Although several studies concerned with the effectiveness of MDA in English Language reading comprehension in particular (Kazemi, Bagheri, and Rassaei 2020; Suherman 2020), there is still little information about the role of MDA in improving Arabic reading comprehension (ARC). To fill this lacuna, this study aimed at the extent of MDA in developing learners' reading comprehension skills in program of Islamic religious education (IRE). Furthermore, the recent study employed two approaches of DA (interventionist and interactionist) into one framework (MAHDA) and examined the effectiveness of this model in promoting learners' cognitive development on ARC.

In addition, after reviewing reputable journals, the similar studies on MAHDA have mostly been conducted in EFL context (Rad, 2021; Roohani & Shafiee Rad, 2019; Sadek, 2015;). However, the majority of researchers investigating MAHDA in educational contexts which have focused on EFL writing instruction; very few have examined the strategies used by Arabic language lecturers to implement MAHDA on learning ARC. In many higher-education institutions, reading comprehension tasks are widely set to cultivate leaners' reading comprehension competence since it is one of primary key the leaners acquire the knowledge for their academic career (Mason, 2004). On the other hands, reading comprehension is a complex process which takes various sources of knowlwdge (Perfetti & Stafura, 2014) and there is no consensus as to which theory is most efficient at explaining it (Yang & Qian, 2019). It also happens to Arabic reading since Arabic reading involves multifaceted components in

understanding the meaning of Arabic text including orthographic system, morpho-syntactic diacritics, word order and recognition, and inflectional vowelization (Saiegh-Haddad, 2003; 2018).

Therefore, this research was conducted to examine the extent of MAHDA in different procedures, namely, human interaction through technological devices. Similarly, the previous research studies applied MAHDA mostly in the context of English academic writing (eg., Rad 2021), but not specific. Also, the effectiveness of MAHDA requires further investigation in a different context (eg., ARC learning). With this reason, this recent study fulfilled the gaps to prove the current MAHDA.

Furthermore, this recent research contributed to lecturers of Arabic language courses in utilizing MAHDA in developing ARC (*fahmūl maqrū'*) abilities which provide more specific procedures for MAHDA which the previous studies have not investigated, for instance, firstly, the aspects of ARC which includes measuring the ability of identifying main ideas, expressions or phrases, implicit and explicit information, grammar, supporting information, and determining word uses (Brown & Abeywickrama, 2004; Alderson, 2000). Secondly, this recent study clear procedure in what ways interventionist and interactionist approaches were embedded into MAHDA framework in promoting the learners' abilities in ARC learning. Both aspects have not been explored in ARC. Thus, this study also took account into the aspects of reading comprehension for learning Arabic texts more easily and faster. Another contribution was for novice Arabic language lecturers who gained new insight about the assessment method for promoting the learners' ARC ability in a more helpful and humanist. As indicated by the pre-test scores, the ARC proved troublesome for the IRE learners; therefore, in this study, they were selected as target of the recent study. The research questions of this study were: What were the effects of MAHDA on IRE learners' ARC? And what were IRE learners' perspectives on MAHDA ARC learning experience?

RESEARCH METHOD

Research Design

This recent study employed a sequential explanatory mixed-methods design in which the quantitative and qualitative data were sequentially collected. With this in mind, the recent design interpreted the quantitative result through qualitative findings (Riazi, 2016). Quantitative data were collected through pre- and post-tests to answer the first research questions. Then, the pre-and post-test data were examined for differences using a paired-sample t-test for each group. Further, the independent-sample t-test was used to determine the differences between the two groups. To obtain faster and more accurate calculation results, researchers employed the Minitab application version 17. To gather qualitative data for answering the second question, interviews were also conducted to investigate the perspectives of experimental group respondents regarding the experiences they experienced (Dornyei, 2007; Riazi, 2016) during the three months of intervention using the MAHDA procedure. To apply research ethics, experimental group respondents were invited and expressed their willingness to be interviewed voluntarily. Use semi-structured interview questions after conducting a post-test in an informal situation so they feel relaxed during the interview.

Research Subject

The recent research involved 20 of 30 learners (from five classes of Islamic education program at a state Islamic higher education in Pontianak). The participants who had resubmitted the consent forms were assigned randomly into the control (Group C) and experimental (Group E) groups. These participants were 19-21 in age and had low Arabic language proficiency. All participants voluntarily joined the research project after the researcher distributed research invitations and negotiations. On the other hand, some learners were not willing to participate in the recent study since they had difficulty accessing the internet connection and this study was

considered demanding. In addition, the participants who were invited to participate in this research to gain the benefits of the present project. Therefore, the roles of researchers were not only to collect data for research purposes but to provide brief directions within the learning session. As a result, the learners gained new knowledge of learning strategies on fahmūl maqrū. At last, all groups (Group C and Group E) were assigned to approve that they completed the online pre-test individually and without any other technology assistance, such as browsing the internet to answer the questions or the tests.

Table 1
Mediation moves

Implicit ↓ Explicit	1. Ask the learners to answer the question in WhatsApp chat 2. Have the learners respond the answer of their peer 3. When the answer is correct, ask the responder to describe the reason of the right answer 4. When the answer is wrong, get the learners to translate the question into Bahasa Indonesia and to find the answer from the text given 5. When the learners are not able to reach the answer after indicating the text, for instance finding key words for reaching the correct answer, ask the learners to translate the text 6. If the learners are still confused, the tutor provides the correct answer with the reasonable description.

Instruments

Quantitatively, the pre-and post-test consisting of 25 questions of ARC within 50 minutes was carried out for each test. Their ARC tests were developed and assessed by three professors of Arabic language meet the validity of the tests. Qualitatively, the content and construct validity included qualitative data were carried out to meet the concept of DA validity in which test items were designed for intervening the learners in succeeding the learning tasks (Cho, Compton, Fuchs, Fuchs, and Bouton, 2012) during teaching session. Further, the final test items (post-test) were also assessed to ensure that the test items actually measured what they were supposed to measure. Moreover, establishing the validity and reliability of the test questions in this context used statistical calculations of the correlation formula and Cronbach's Alpha. Also, the result of the pre-test was used to determine the homogeneity of the participants of each group. Since the results of each group were higher than α (sig > 0.05), the two groups were considered homogeneous (see Figure 1). Further, the results of pre-and post-test of the control and experimental groups were compared for the difference using paired-sample t-test. to examine the distinction between control and experimental group, the independent-sample t-test was employed.

Method	DF1	DF2	Test Statistic	P-Value
Bonett	1	—	2,48	0,116
Levene	1	18	2,17	0,158

Figure 1. The homogeneity of the samples

In teaching session, experimental group was assigned to involve in WhatsApp group created by the researchers and discussed each question of the pre-test with the researchers. Therefore, the roles of researchers were to facilitate and provide some prompts or hints when they were not able to answer the questions correctly. The activities took three sessions (two months). The chats were captured to see the atmosphere of the discussions. These data were also used to provide the mediation activities and to support the findings of interview data.

Moreover, the data were also gathered through semi-structured interviews with the experimental group after completing the post-test. Eight guiding questions were interrogated in Bahasa Indonesia to avoid miscomprehending between the researchers and the learner interviewees. Semi-structured interviews were employed to gain more elaboration (Mackey and Gass, 2015) through an exploratory way (Dornyei, 2007). The interviewer-interviewee voices were recorded and transcribed verbatimly. These data were utilized to capture the mediation moves.

Data Analysis

To analyze the data, quantitative and qualitative procedures were involved. The quantitative data were statistically analyzed through Minitab application version 17 (see Figures 1 to 4 for the display of the application results). To find the distinction of the pre-and post-test scores of each group, a paired-sample t-test was calculated. For the analysis of the significant differences between two groups (C and E) regarding the pre-and post-test, an independent-sample t-test was also employed. Each t-test was consulted with alpha (α) (0.05). when the t-test results were lower than α, it showed that there were significant differences between the pre-and post-test and the post-test results of the control and experimental groups. Further, the results of this interview were transcribed using the procedure by Widodo (2014) of playing back and listening to the recorded interview, presenting the verbal data, detailing and interpreting the data, and building the data by applying member checking. After all these processes have been completed, the data were then analyzed thematically into negative and positive perspectives of the current MAHDA implementation.

RESEARCH FINDINGS AND DISCUSSION

Research Findings

To answer the first question, the researcher calculated a paired-sample t-test to compare the difference pre- and post-test of each group. The t-test result for Group C proved that there was no significant distinction between pre-and post-test (sig > 0.05) as shown in Figure 2.

Paired T-Test and CI: Pre-test; Post-test

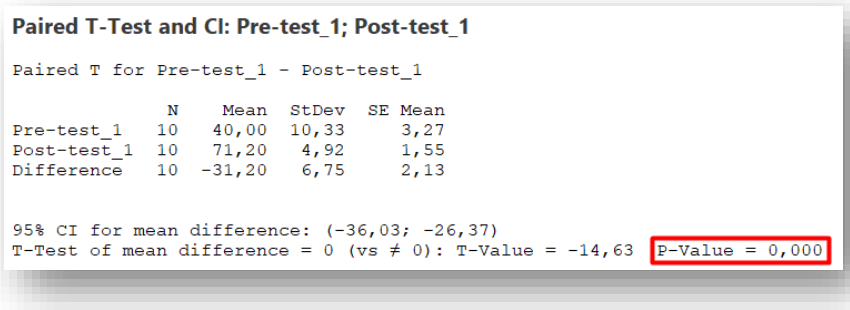
Paired T for Pre-test - Post-test

	N	Mean	StDev	SE Mean
Pre-test	10	48,80	9,76	3,09
Post-test	10	45,20	11,63	3,68
Difference	10	3,60	9,32	2,95

95% CI for mean difference: (-3,07; 10,27)
T-Test of mean difference = 0 (vs ≠ 0): T-Value = 1,22 P-Value = 0,253

Figure 2. The result of the paired-sample t-test for Group C

Figure 3 shows that the mean of pre-and post-tests were significantly different (sig < 0.05). This result reveals that Group E performed better in their post-test.



Paired T-Test and CI: Pre-test_1; Post-test_1

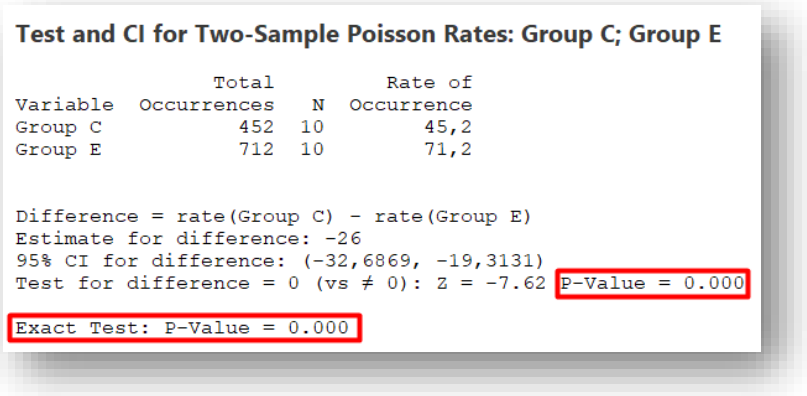
Paired T for Pre-test_1 - Post-test_1

	N	Mean	StDev	SE Mean
Pre-test_1	10	40,00	10,33	3,27
Post-test_1	10	71,20	4,92	1,55
Difference	10	-31,20	6,75	2,13

95% CI for mean difference: (-36,03; -26,37)
T-Test of mean difference = 0 (vs ≠ 0): T-Value = -14,63 P-Value = 0,000

Figure 3. The result of the paired-sample t-test for Group E

In addition to comparing the means of post-test for two groups (C and E), Figure 4 indicated that there was a meaningful difference between the two groups (sig < 0.05) and it can be concluded dynamic assessment was effective to be implemented in this recent research context.



Test and CI for Two-Sample Poisson Rates: Group C; Group E

Variable	Total Occurrences	N	Rate of Occurrence
Group C	452	10	45,2
Group E	712	10	71,2

Difference = rate(Group C) - rate(Group E)
Estimate for difference: -26
95% CI for difference: (-32,6869, -19,3131)
Test for difference = 0 (vs ≠ 0): Z = -7.62 P-Value = 0.000

Exact Test: P-Value = 0.000

Figure 4. The result of the independent sample t-test for Groups

Furthermore, this section explores the IRE learners' perspectives on the learning experience during the MAHDA session to answer the second question. In this case, ten participants from the experimental group volunteered to be interviewed. After analyzing the interview transcripts, three themes emerge through thematic analysis, positive aspects, negative aspects, and suggestions from the implementation of MAHDA. Each theme and its code were explained by providing excerpts from the interview data. Anonymously, pseudonyms were employed for the learners ranging from E1 to E10. The findings indicated that the participants had positive attitudes toward the MAHDA experience. The excerpts are provided as follows:

E1 : I preferred this dynamic method because I could ask the lecturer in the group when something was difficult to understand.
E2 : The provision of group discussion made me easier to understand.
E3 : With Discussion of this assessment method, we could share our ideas or experiences with others.
E4 : When there were incorrect answers, mediation from lecturers and peers was provided.
E6 : With Discussion, a lot of knowledge could be obtained from other people.
E7 : The dynamic assessment provided discussions in which the problems could be resolved more easily, establish harmony, strengthen

cooperation, get used to respecting other opinions, and gain new understanding from them.

E8 : The dynamic assessment method did not only complete the test but also discussed the test. With this in mind, the wrong answers were discussed together.

E9 : With discussions, we could share ideas, opinions, and suggestions, and when we did not understand, we could ask the solution in the group.

E10 : I preferred dynamic assessment because I received more knowledge and experience.

Further, eight out of ten learners reported that the mediation that had been most beneficial to the development of the ARC area was the ability to find the meaning of Arabic words (as E1, E2, E3, E4, E6, E8, E9, and E10), main idea (E5 leaner), and all aspects (E7).

On the other hand, the negative perspectives of implementing MAHDA were also recorded. One learner said that the impact of MAHDA on cognitive development was not so significant. Based on the chat record, this learner was not active in the discussion. Therefore, the researchers contacted him for several times. Fortunately, one of his friends informed that he had a problem with the internet connection. With this in mind, communication became hampered. Here is the excerpt:

> *E5: The impact of this assessment method was not so significant. I was late in receiving information or intervention because of a poor internet connection.*

This finding showed the internet connection was challenging (for one learner) for implementing MAHDA. Lastly, the learner proposed an idea for improving the intervention through virtual or face-to-face meetings since she thought that she would get more knowledge.

> *E7: In my opinion, this dynamic assessment method should not only be implemented via WhatsApp chat but also the Google Meet application or face-to-face class since it allowed me to attain more new insights.*

Discussion

This study was conducted with the primary objective of examining the impact of Modified Argumentative Hypertext Discourse Analysis (MAHDA) on Argumentative Reading and Critical (ARC) abilities in the context of Islamic Religious Education (IRE) for learners. The research adopted a dual-pronged methodological approach, employing both qualitative and quantitative methods within a sequential explanatory mixed methods design for data collection and analysis. The quantitative findings of the study disclosed a significant disparity in the development of ARC abilities between the experimental group, exposed to MAHDA, and the control group. Notably, MAHDA exhibited efficacy not only in enhancing cognitive development within English as a Foreign Language (EFL) instruction but also in Arabic language settings, as evidenced by discernible discrepancies in pre-test and post-test average scores, substantiated by t-test results. Further supporting these quantitative outcomes, the qualitative data from interviews illuminated the establishment of interactive dynamics between learners and lecturers, as well as among learners themselves, as a mechanism for resolving learning challenges. Consequently, discernible positive changes were observed in the abilities of the learners. This resonates with Vygotsky's (1978) assertion that minimal changes in current abilities signify developmental progress. In sum, the amalgamation of quantitative and qualitative methodologies in this study provides a comprehensive understanding of the

constructive impact of MAHDA on the ARC abilities of IRE learners, underscoring its effectiveness in diverse language learning contexts.

The impact of the Mobile-Assisted Hybrid Dynamic Assessment (MAHDA) procedure has proven to be influential in fostering cognitive development within the context of Argumentative Reading and Critical (ARC) abilities in Islamic higher education institutions. MAHDA, as an acronym employed in this study, is intricately derived from a synthesis of theoretical underpinnings, specifically Mobile-Assisted Language Learning (MALL) and Hybrid Dynamic Assessment (HDA). The integration of mobile learning, as underscored by Ally (2013), serves to extend the learning environment beyond the confines of the traditional classroom, enabling learners to engage with educational materials and activities from diverse locations. The flexibility provided by mobile learning, as articulated by Fernández-López et al. (2013), facilitates increased interaction with learning materials, contributing to a more dynamic and versatile learning experience. Furthermore, the underpinning concept of Dynamic Assessment (DA) within MAHDA finds its roots in Vygotsky's Sociocultural Theory (SCT), specifically the Zone of Proximal Development (ZPD), as elucidated by Vygotsky (1978). In consonance with Vygotskian principles, DA, as expounded by Poehner (2008a, 2008b) and Poehner and Lantolf (2013), emphasizes the interactive engagement between educators or more proficient peers and learners. This collaborative interaction within the ZPD is designed to enhance learners' cognitive development by capitalizing on the assistance and scaffolding provided by those more knowledgeable in the subject matter. Consequently, the amalgamation of MALL and HDA within the MAHDA framework not only extends the learning environment but also leverages Vygotskian principles to optimize cognitive growth in ARC abilities among learners within Islamic higher education institutions.

The findings of this study find resonance with scholarly perspectives that advocate for the efficacy of Mobile-Assisted Language Learning (MALL) in augmenting learners' potential for acquiring knowledge, as posited by Yang and Qian (2019). Notably, the integration of mobile technology in language education has seen a global application of Dynamic Assessment (DA), particularly in foreign language assessment contexts such as English. A growing body of research has substantiated the effectiveness of Mobile-Based Dynamic Assessment (MDA) in enhancing language learning potential. Noteworthy studies supporting this assertion include those conducted by Andujar (2020), Ebadi and Bashir (2020), Tarighat and Khodabakhsh (2016), Moeinpour, Nasiri, Pineh, and Davarpanah (2019), Rassaei (2023), Rezaee, Alavi, and Razzaghifard (2019), and Kaveh and Rassaei (2022). The cumulative evidence from these research endeavors underscores the positive impact of employing mobile technologies in conjunction with Dynamic Assessment methodologies, indicating a global trend toward recognizing the efficacy of Mobile-Based Dynamic Assessment (MDA) for enhancing language learning potential. These findings contribute to the growing body of literature that supports the integration of innovative technological approaches in language education, particularly in the realm of assessment, and emphasizes the applicability of such methods across diverse linguistic and educational contexts.

The outcomes of this study are intricately linked to the utilization of learning media, specifically, the WhatsApp application. Despite the learners' lack of prior exposure to Modified Argumentative Hypertext Discourse Analysis, they reported employing the WhatsApp platform for educational purposes, exchanging messages and multimedia content to meet their learning needs. This stands in contrast to the perspective put forth by Dehghan et al. (2017), who contend that WhatsApp primarily serves an entertainment function and is not inherently suited for educational purposes. However, the current findings find resonance in other scholarly works, such as Ebadi and Bashir's (2020) study, which demonstrated the positive impact of social media, including WhatsApp, on learners' writing proficiency. Additionally, Ma and Yodkamlue's (2019) research corroborated the efficacy of mobile learning, aligning with the

present study's assertion that learners perceived MAHDA as efficient, convenient, and conducive to reduced social pressure. The congruence between the current study and existing literature underscores the need for Arabic language lecturers to consider instructional strategies, specifically mediation, aimed at mitigating social pressures that may impede the learning process and cognitive development of learners. The recognition of the positive aspects of learning through social media platforms, such as WhatsApp, suggests the importance of incorporating innovative teaching methodologies that align with the preferences and experiences of contemporary learners, thereby fostering a conducive and effective learning environment.

CONCLUSION

This research highlights the significance of discussion-based mediation via mobile devices which can contribute to better learner performance. It is suggested that IRE lecturers use web resources and face-to-face classes as tools and mediation strategies framed through MAHDA in teaching ARC in both individual and group formats to enhance their learners' ARC abilities and uncover their level of ZPD. Further research might explore the effects of different proficiency levels, gender, and learning styles of different learners. This research has significant implications for Arabic language lecturers specifically regarding the cellular potential for foreign language teaching. One of the implications of this research is to promote the use of mobile learning as mediation DA framework to teach various features of Arabic including reading comprehension of Arabic. The second important implication of this research is also for lecturers to consider and evaluate various feedback or mediation as a measure of development and assessment. For assessment purposes, as part of MAHDA, lecturers can evaluate student interventions or feedback to gain further insight into students' developing abilities. Tests and mediation procedures in the form of reciprocity can be prepared for individual and group assessment for classroom and online teaching to track the progress of Arabic language learners in IRE study programs.

One of the important limitations of this research is what has been suggested by learner participants for IRE lecturers to use web resources and face-to-face classes as mediation tools and strategies framed through MAHDA in teaching ARC in individual and group formats to improve their students' ARC abilities and reveal their ZPD level. Therefore, further research needs to investigate MAHDA with different strategies, for instance involving face-to-face interaction in the classroom. In addition, this research was conducted in one site with small sample; thus, future research is required in a larger site and samples to generate the effectiveness of MAHDA.

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