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Development of mobile application-based digital drama for Arabic language to improve students' vocabulary

Nurul Azni Mhd Alkasirah, Mariam Mohamad, Mageswaran Sanmugam, Girija Ramdas
Centre for Instructional Technology and Multimedia, Universiti Sains Malaysia, Penang, Malaysia

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ABSTRACT

The Arabic language is one of the foreign languages offered in Malaysian education. In Arabic, learning vocabulary is particularly important because it forms the foundation of language acquisition. However, past research showed that a large number of Malaysian students struggle with understanding and memorizing Arabic vocabulary because they are unfamiliar with it. Thus, this research focuses on developing an appropriate mobile application that will support Malaysian religious secondary school students in improving their mastery of Arabic vocabulary. This study attempts to create a mobile application-based digital drama by adopting the analyze, design, develop, implement, and evaluate (ADDIE) model. The ADDIE model was integrated as a structured approach for producing educational material that is both enjoyable and beneficial to students. Six subject matter experts were invited to evaluate the effectiveness of the mobile application-based digital drama. Based on the validation results and feedback obtained, it can be concluded that mobile application-based digital drama was valid and effective with high scores for format and graphic suitability to be utilized as an instructional tool for learning Arabic vocabulary among Malaysian religious secondary school students.

Corresponding Author:

Mariam Mohamad
Centre for Instructional Technology and Multimedia, Universiti Sains Malaysia
Penang, Malaysia
Email: mmohamad@usm.my

1. INTRODUCTION

Vocabulary is a key factor needed in mastering a language [1]. It is the main basis for teaching students of second or foreign language [2]. For this fact, vocabulary is at the heart of any language learning which is known as a term or collection of words that plays a pivotal role for a person uses regularly in speaking and interacting with others, particularly for students who studying an additional language [3], [4]. A strong vocabulary enhances proficient readers, communication skills and also affects social and emotional interactions [5]. Mastery of vocabulary is essential for learning Arabic and has been consistently highlighted by both Arabic language experts and educational practitioners [6]. To effectively learn Arabic, it is crucial to provide students with ample exposure to Arabic vocabulary, enabling them to master words and phrases in meaningful [7].

In the Malaysian educational context, most Muslim students start learning Arabic in their first year of primary school, while some begin as early as kindergarten [8]. However, many students have a relatively limited command of Arabic vocabulary [9]. Despite studying Arabic for several years at school, they still face difficulties to master the Arabic language due to a the lack of a supportive learning environment that spans different educational stages, including secondary schools, government and private religious institutions and universities [10]. Students often lack familiarity with using Arabic as a means of communication. To address this, teachers must employ diverse strategies to motivate students, helping them retain vocabulary more

effectively and build a stronger command of the Arabic language [11]. Various approaches, techniques, and tools can be utilized for this purpose, particularly through the use of digital technology.

In the information age, digital technology serves as an educational approach that leverages technology to fulfill curriculum requirements and acts as a crucial tool for enhancing the quality of instruction [12]. Often regarded as an educational support tool, it enables teachers and students to interact more effectively with learning materials [13]. Digital technology expands the range of platforms available for acquiring digital educational resources. A study of Dianah *et al*. [11] stated that various digital technologies are utilized in Malaysian educational institutions. One of the education approaches that has a positive impact on enhancing and deepening the learning process is digital drama [14]. Furthermore, studies have indeed shown that digital drama can be an effective tool in enhancing students' vocabulary and boosting their motivation to learn. It is a significant addition to the application process and theoretical frameworks for the use of digital technologies, going beyond basic visual storytelling [15], [16]. It has great potential to enhance education, but it is unlikely to completely replace traditional classroom approaches in the future. Students can learn more efficiently and become more motivated to master languages especially foreign languages when digital drama is used. Watching dramas can assist them enhance their vocabulary and sentence structure indirectly [17]. This coincides with a study conducted by Sari and Aminatun [18] stated that dramas or movies can encourage students to learn new languages and simulate a real educational environment, which can help in vocabulary learning.

Digital drama has been formulated to describe the combination of theatre and digital technology that being used on mobile devices, social media platforms, websites, and television, driven by the rapid development of technology and media networks in the 21st century [19]. Using digital drama in mobile devices has made it more accessible interactive, and engaging, providing students with a modern, flexible approach to learning Arabic vocabulary. According to Barakat [14], the use of digital drama assists students become more expressive and receptive language users. Students can interact without being afraid and shy around others. Besides, Thao *et al.* [16] indicated that digital drama is used to improve writing and reading skills. It also grows in importance and usefulness as an effective tool in education, further transforming the way students acquire language and other skills through creative expression.

The use of mobile applications has become increasingly essential in contemporary life, particularly within educational contexts. Numerous applications have been created for educational purposes such as Kahoot, Zappar, and Padlet and each of these applications provides different usage that to enhance students' learning [20]. In addition, the use of mobile applications can indirectly optimize the time students spend on their studies and enable students to access educational materials anytime and anywhere. The utilization of mobile applications can be applied to increase motivation and self-confidence in the process of learning Arabic vocabulary [21]. With a variety of features designed to keep students interested, these applications create an inviting and supportive environment for language acquisition. Students can access educational content anytime and anywhere with the support of mobile applications, resulting in more efficient and flexible educational opportunities [22]. Besides, Jurayev [22] also stated that the implementation of mobile applications customized for educational needs has great potential to improve learning standards. These apps offer innovative features that cover various aspects of the educational experience and help students get better results. Thus, using a mobile application-based digital drama for learning Arabic vocabulary is also consistent with the current advancements in technology. The application that has been built is anticipated to become a useful learning tool for students and facilitate their acquisition and improvement of the Arabic language.

This study focuses on adapting the analyze, design, develop, implement, and evaluate (ADDIE) instructional model to develop a mobile application-based digital drama aimed at enhancing Arabic vocabulary learning among Malaysia religious secondary school students. This approach integrates drama with digital technology and researchers have chosen one of the topics from form one Arabic language syllabus as a learning content in the application developed. The aim of developing this learning application is to offer students new learning opportunities in learning Arabic vocabulary, giving them resources to learn outside of the classroom and investigating the effectiveness of using mobile application-based digital drama. This study provides a guideline to the researchers by using the ADDIE model in focusing on developing instructional materials, particularly for Arabic vocabulary. This study proposes two objectives: i) to develop a mobile application-based digital drama by using the ADDIE model for learning Arabic vocabulary and ii) to evaluate the functionality of the mobile application-based digital drama by subject matter experts.

2. METHOD

In this research, the researchers applied the ADDIE model as an instructional design to develop a mobile application-based digital drama for learning Arabic vocabulary. The ADDIE is a systematic instructional design and development framework that provides a structured approach, it allows the repetition process from phase to the next phase and the researchers can return to the previous phase to make adjustments

if results from a phase are unsatisfactory [23]. It consists of five structured phases that guide the development of educational programs: analysis, design, development, implementation, and evaluation. The first phase is the analysis stage. This stage is determining the specific learning requirements related to fractions. Following the analysis is the design phase. This stage involves creating a structured logical and effective to meet the goal plan for the learning experience. While in the development phase, the instructional materials and resources that were planned, are created to align with the learning objectives established in the design phase. In the implementation phase, the developed materials are put into action and the learning experience is delivered to students. The final stage of the ADDIE model is the evaluation phase. This phase provides valuable feedback on the effectiveness of the instructional program whether the learning objectives have been accomplished or may be needed to better meet. Figure 1 shows the stages of the ADDIE model.

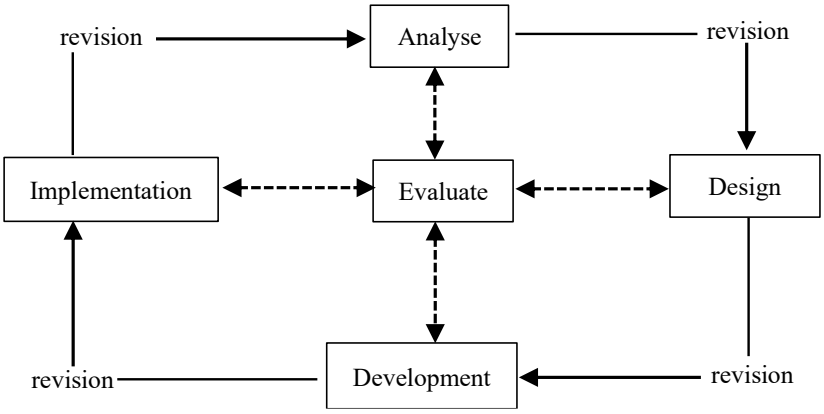

Figure 1. ADDIE model

2.1. Analysis phase

The analysis phase is indeed foundational in the design of an application. During this stage, researchers engaged in several analytical tasks to comprehensively understand user needs and identify potential benefits of the new product in enhancing the teaching and learning of Arabic. By focusing on user-centered design, the mobile application for learning Arabic vocabulary aims to enhance both the effectiveness and enjoyment of the learning process. To inform the development of a more effective learning application, researchers collected insights into the challenges students face in mastering Arabic vocabulary.

The researchers conducted interviews with four of the first year of secondary school students at a National Religious Secondary School in Malaysia. All students interviewed who had been studying Arabic since primary school. They were very cooperative and provided valuable insight to the researchers. From the interviews, the researchers identified several challenges in learning Arabic vocabulary. The interviews revealed that students' proficiency in Arabic vocabulary remains low and requires further attention. Besides, the researchers found that the implemented syllabus places significant emphasis on students' vocabulary mastery, requiring them to achieve a set target for the number of words learned. There is a lack of reference materials related to Arabic vocabulary, both in printed and digital formats. Furthermore, limited technological facilities in schools pose a challenge for Arabic teachers in integrating digital tools into the teaching and learning process.

Researchers also clearly outlined three key learning objectives in this stage for guiding the design process: understanding the meaning of Arabic vocabulary, retaining vocabulary and applying vocabulary for independent learning. Researchers identified students'need and carefully selected suitable content for the application. Additionally, a thorough analysis was conducted on factors such as age, Arabic proficiency level, and learning styles to ensure the application met user needs and sparked interest. Researchers also noticed that most of students had experience using mobile application for learning. Insights from the analysis phase were crucial for informing the design phase.

2.2. Design phase

The second phase in the ADDIE Model is the design phase. In this phase, the researchers outline how the learning objectives identified in the analysis phase are to be achieved. Researchers ensure that all instructional elements are meticulously planned out is tightly aligned with the learning objectives before moving on to the next phase, the development phase. There are a few things that researchers gave attention.

The researchers chose to use drama digital as learning strategy in the application. Drama strategy is one of learning method that are increasingly used in conveying information to students. The shift from traditional to digital delivery strategies is in line with today's digital technology era. The combination of multimedia elements such as color, images, text and animation as well as interactive buttons makes the delivery method more creative and innovative. Indirectly, the multimedia elements applied in this learning strategy can support the process of delivering information to students.

The researchers selected instructional strategies that most effectively engaged users and helped achieve learning outcomes. Choosing PowToon, Wix, and Canva to create the mobile application-based digital drama made sense because these tools are user-friendly, accessible, and powerful for developing interactive and multimedia content. Through the Powtoon software, users are also provided with a variety of animated characters to choose from that can support the material being presented. Researchers adopt Wix as a learning platform. Wix software provides over 500 templates and various design features such as text, galleries and vector art that are suitable for use on computers and mobile devices. The advantage of Canva is that it has a variety of interesting and useful graphic designs to produce creativity, has good resolution image quality and there are no limitations in using the graphics provided. The researchers designed the script by searching for materials and information. The first grade Arabic textbook was used as the main reference material. In addition, discussions with Arabic teachers were also conducted to adapt the script environment to the students. The script writing was written in Arabic. Four scripts were produced for this application.

2.3. Development phase

Once the design phase has been completed, the development phase is carried out, in which the actual production of learning material and content takes place. In this phase, the development process focuses on creating learning content based on the flowcharts and storyboards that were developed as a guide in the earlier analysis and design phase. This parallel approach helps to maintain consistency and reduces the likelihood of deviating from the original objectives.

The researchers developed a mobile application-based digital drama for secondary school students to learn Arabic vocabulary. Various narrative elements such as plot, theme, character, and setting were integrated into the learning process to engage students and contextualize the vocabulary into meaningful situations. The use of Canva to create the texts is also a creative approach to presenting content in dynamic, visually stimulating formats. Clear and concise text can reduce cognitive load and allow students to grasp the information more quickly. Researchers also paid attention to the choice of colors. The use of bright colors in learning applications plays an important role in balancing brightness and reducing stress for students [24]. Researchers also produced animation for educational purposes using PowToon software. Animated sequences can show how words are used in real-life situations, making it easier for students to grasp the meaning and context. Next, the researchers recorded the audio according to a prepared script to ensure that the vocabulary was pronounced correctly. In this study, the researcher developed a learning video that integrates educational elements related to the topic of Arabic language learning. Interactivity in this application is also applied to the display of learning videos where users can mute or unmute the sound and then the user can control the movement of the video.

2.4. Implementation phase

In the fourth phase of the ADDIE model, a complete mobile application-digital drama has been developed, featuring a combination of content such as audio, images, and animations that meet predetermined criteria. Once the application was ready, it is uploaded to Android devices. At this stage, testing of the learning materials is essential to gather user feedback. This testing involves technology experts and Arabic language experts based on criteria from the analysis phase. There were four learning sessions using the application and they were conducted over four weeks. The application learning session was conducted in the fourth week of the entire implementation process of the study intervention. Students are required to undergo one application learning session each week. After the end of the learning session using the application, all students were given questionnaires in the ninth week.

2.5. Evaluation phase

The final phase of the ADDIE model is the evaluation phase, in which the effectiveness and quality of the mobile application-based digital drama were determined before the researchers distribute it. This phase provides not only the immediate effectiveness of the learning material but also focuses on long-term sustainability and improvement [24]. It incorporates feedback from subject matter experts regarding the design and multimedia aspects. There are two types of assessment, namely formative and summative. For formative assessment, assessment is carried out continuously on each phase throughout the development of application materials from the analysis, design, development phase to the implementation phase. Meanwhile, summative assessment is carried out at the end of the program after the initial four phases have been implemented to

determine its effectiveness on the quality of learning. Formative evaluation of the application is carried out throughout the design and development phase and continuously until after the pilot test to improve the level of effectiveness of the application before the actual implementation is carried out. Summative evaluation is conducted after all four initial phases of application development have been completed and aims to evaluate the overall final version of the application.

A development that is produced will affect the delivery of information to users whether it can be well received or otherwise. The application evaluation form was reviewed and evaluated by two lecturers with more than eight years of experience before being distributed to application evaluation experts. This application evaluation form uses a five-point Likert scale, which is 1=strongly disagree, 2=disagree, 3=less agree, 4=agree, and 5=strongly agree. For the evaluator's views and suggestions, data were collected based on format design and graphic content.

2.6. Subject matter experts' demographic

Mobile application-based digital drama requires the involvement of subject matter experts to evaluate the usability of the application and identify its strengths and weaknesses. Multimedia experts and content experts were involved in the evaluation, including three multimedia experts and three experts in the field of Arabic. The multimedia experts were selected to provide detailed feedback on the technical and design aspects to ensure that the application meets usability standards and provides a seamless experience. At the same time, content experts with extensive experience in the Arabic language were selected to provide insight into the accuracy, relevance, and effectiveness of the digital drama's content. These two expert approaches ensure a comprehensive evaluation of both the multimedia elements and the educational content of the application. Therefore, six subject matter experts are consulted to ensure that the application is both visually appealing and pedagogically sound.

3. RESULTS

The design and multimedia aspects of mobile application-based digital drama are evaluated based on two key elements: format and graphic format. According to Stemler [25], the design of the application significantly influences how well users receive and process information. Table 1 shows the evaluation of mobile application-based digital drama in terms of format design. Overall, the findings indicated that the mean score is high, (M=4.60, SP=0.331). A detailed analysis reveals that the highest mean score in the evaluation of the mobile application-based digital drama belongs to the item "the content of the learning module is in line with the needs of the study" (M=4.83, SP=0.408), indicating strong expert agreement on the relevance of the contents. Furthermore, the results also reveal that three of the seven items obtained a mean score of 4.67 which are the items "the type of writing used is easy to understand", "the mobile application-based digital drama", "meets students' Arabic vocabulary" and "delivery of learning contents are structured". There are two of the seven items that obtained a mean score of 4.50 such as "the screen display of the mobile application-based digital drama is easy to understand" and "the mobile application-based digital drama delivery technique is appropriate". The item "the layout of the mobile application-based digital drama is clear" received the lowest mean score among the high-level ratings (M=4.33, SP=0.516). This suggests that while the layout is considered adequate, it is an area with potential for improvement. Overall, the subject matter experts agree that the learning content is highly relevant and well-aligned with the educational objectives of the study.

Table 1. Format design by subject matter experts

Items	N	Mean	Standard deviation	Interpretation level mean
The layout of the mobile application-based digital drama is clear	6	4.33	.516	High
The type of writing used is easy to understand	6	4.67	.516	High
The screen display of the mobile application-based digital drama is easy to understand	6	4.50	.548	High
The mobile application-based digital drama delivery technique is appropriate	6	4.50	.548	High
The content of the learning module is in line with the needs of the study	6	4.83	.408	High
The mobile application-based digital drama meets students' Arabic vocabulary learning	6	4.67	.516	High
Delivery of learning contents is structured	6	4.67	.516	High
Overall		4.60	.331	High

Table 2 presents the evaluation of the graphic content in the mobile application-based digital drama. The overall results indicate a high score mean, (M=4.63 SP=0.296), showing positive feedback from experts regarding the graphic elements. The item "the mobile application-based digital drama uses appropriate colors" received the highest mean score (M=5.00, SP=0.000), demonstrating unanimous agreement among subject matter experts on the graphic content aspect. Additionally, four of eight items achieved a mean score of 4.67 with a standard deviation of 0.516 such as "the mobile application-based digital drama is suitable for the student's level of knowledge", "the graphic presentation in the application content is easy to understand", "the story structure given in the application is easy to follow" and "the language used is suitable for students". Two other items "the mobile application-based digital drama has a clear visual picture" and "the mobile application-based digital drama has an attention-grabbing multimedia element" received a mean score of 4.83 and 4.50, respectively. The lowest mean score, although still at a high level, was for the item "mobile application-based digital drama has clear sound effects" which scored 4.00 with a standard deviation of 1.095. Despite being the lowest-rated item, it is still viewed positively overall. These findings suggest that the graphic content of mobile application-based digital drama is highly regarded by subject matter experts and aligns well with the overall design of the application.

Table 2. Graphic content by subject matter experts

Items	N	Mean	Standard deviation	Interpretation level mean
The mobile application-based digital drama is suitable for the student's level of knowledge	6	4.67	.516	High
The mobile application-based digital drama uses appropriate colours	6	5.00	.000	High
The mobile application-based digital drama has a clear visual picture	6	4.83	.408	High
Mobile application-based digital drama app has clear sound effects	6	4.00	1.095	High
The graphic presentation in the application content is easy to understand	6	4.67	.516	High
The story structure given in the application is easy to follow	6	4.67	.516	High
The language used is suitable for students	6	4.67	.516	High
The mobile application-based digital drama has an attention-grabbing multimedia element	6	4.50	.548	High
Overall		4.63	.296	High

4. DISCUSSION

This mobile application-based digital drama was developed to simplify the process of mastering Arabic vocabulary for secondary students, particularly aimed at form one secondary students. This application provides supplementary learning material to enhance vocabulary retention and contextual understanding through interactive and engaging digital content. In developing the mobile application-based digital drama, researchers used the educational development research design, ADDIE model which consists of five stages: analysis, design, development, implementation, and evaluation. Researchers have chosen the ADDIE model because it is particularly suitable for the development of an educational application and is also more consistent in achieving the objectives.

The first phase of this study was the analysis stage. At this stage, the problems were identified. It was found that students relied heavily on rote memorization to remember vocabulary. This finding is consistent with previous research [1], [2] in which the depth of Arabic vocabulary among secondary students is still low and moderate level. Therefore, it affects students in the mastery of Arabic language skills which are speaking, listening, reading, and writing. Besides, researchers found that there is a lack of accessible resources such as books or digital materials, and limited technological facilities in schools to teach the Arabic language. This finding aligns with that of Sallehuddin *et al.* [26], which found that many teachers still focus on using the conventional method compared to using the modern approach in teaching and learning Arabic vocabulary. Teachers might be hesitant to adopt certain techniques because their schools might not have the appropriate resources or access to the necessary tools like audio labs or electronic libraries [9]. The second phase was designed, namely the stage of determining the design to be achieved in developing mobile application-based digital drama. Based on the results obtained in the previous phase, a framework was created for the process of development of this application. The design phase involves user interface development, ensuring the app is intuitive and engaging. The design of the application helps students with simpler design to become students proficient in using the application developed. The usage of animation in the application and supported by audio as well as text are important to help students understand the concept of learning more clearly [27].

Next, the third phase of creating a mobile application-based drama digital for learning Arabic vocabulary focuses on the technical construction and operational processes of the application. At this stage, the researchers integrate all previously gathered information into the educational framework and procedures, ensuring that the application is tailored to meet the specific needs of students [28]. This customization is essential for fostering engagement and ensuring that students can relate to the content effectively. The fourth phase was implementation which describes its use in educational settings, assessing the application's design effectively supports Arabic vocabulary acquisition and user engagement. A completed mobile application-based digital drama has been developed with content and a combination of audio, images, and animations according to the criteria previously set. The learning method in the application needs to be tested to get feedback from users [24]. The last phase was evaluation. This phase is a follow-up from the implementation stage which is to evaluate the extent to which the learning method developed has achieved the goal and it is important for the improvement of the application developed from time to time [24].

This application has received positive feedback from subject matter experts. The subject matter experts agreed that the format and graphics are suitable for use in this mobile application-based digital drama. This explains that these two aspects were successfully incorporated into the application developed for learning Arabic vocabulary among secondary school students. Therefore, it has reached the standard level of the basic standard for a learning method produced.

5. CONCLUSION

This study demonstrates the utilization of ADDIE instructional design model in developing a mobile application-based digital drama to enhance Arabic vocabulary acquisition. Through a systematic approach that includes analysis, design, development, implementation, and evaluation, the application was tailored to the specific needs of students and provides an interactive and engaging tool for language learning. The integration of mobile application-based digital drama provides students with a contextualized environment in which vocabulary is presented through stories, dialogues, and real-life scenarios. This innovative approach combines mobile technology with digital drama, specifically designed to meet the needs and context of Arabic vocabulary students in Malaysia, a method that has still not been adopted in the field of education. This method helps users not only memorize vocabulary but also understand its practical applications, leading to deeper memorization. This study emphasizes the value of instructional design models like ADDIE to create educational technologies that effectively student needs and pedagogical goals, incorporating creative digital techniqueswithin a mobile platform.

In addition, the study highlights the benefits of mobile learning such as accessibility and flexibility, allowing students to practice vocabulary at their own pace. The evaluation phase indicates that the application is an effective and efficient tool for learning Arabic vocabulary. The use of the ADDIE model ensures that the application has been well-designed and thoroughly tested, which contributes to its success. In conclusion, the study demonstrates the potential of using technology and instructional design models to develop innovative educational tools. The combination of mobile learning and drama-based instruction provides a scalable and engaging solution for students that can be used in different educational contexts.

Based on these results, researchers aim to enhance the mobile application-based digital drama by incorporating improved features. Future efforts will focus on developing application that cover all topics from the Arabic language syllabus for Form One. Additionally, future designs will prioritize aspects such as button layout, text presentation, and overall design techniques. The text used will be selected to ensure clarity and understanding, while also creating an engaging and enjoyable experience for users.

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Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Nurul Azni Mhd Alkasirah	✓	✓	✓		✓			✓	✓	✓			✓	✓
Mariam Mohamad		✓		✓				✓	✓	✓	✓	✓		✓
Mageswaran Sanmugam		✓	✓	✓		✓	✓		✓			✓	✓	
Girija Ramdas	✓					✓	✓		✓	✓	✓			

C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
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Fo : **Fo**rmal analysis
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R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

INFORMED CONSENT

We have obtained informed consent from all individuals included in this study.

ETHICAL APPROVAL

The research related to human use has been complied with all the relevant national regulations and institutional policies in accordance with the tenets of the Policy Planning and Researh Division of the Ministry of Education Malaysia and has been approved by Pulau Pinang State Education Department.

DATA AVAILABILITY

The data that support the findings of this study are available from the first author, [NAMA], upon reasonable request.

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BIOGRAPHIES OF AUTHORS

Nurul Azni Mhd Alkasirah she finished her Bachelor's degree in Applied Science with Islamic studies from Universiti Malaya, Kuala Lumpur in 2008. After graduation, she joined Universiti Sains Malaysia as Research Officer at School of Distance Education. Later, she furthered and finished her Master's in Educational Technology at USM in 2016. Currently, she finished her studies in PHD in Educational Technology at Centre for Instructional Technology and Multimedia, Universiti Sains Malaysia, Penang, Malaysia. She can be contacted at email: nurulazni@student.usm.my.

Mariam Mohamad is the senior lecturer in Centre for Instructional Technology and Multimedia, Universiti Sains Malaysia, Penang, Malaysia. She is as the President for Dyslexia Association, Penang State and the Advisor for Special Need Students Association, University Sains Malaysia. She is a committee member for Research and Development Unit, Malaysian Association for The Blind. She is acknowledged as one of the pioneers from Malaysia in mobile learning research, in the book entitled Mobile Learning in Higher Education in the Asia-Pacific Region published by Springer. Her work was also referred by UNESCO in the publication entitled; Turning on Mobile Learning: Illustrative Initiatives and Policy Implications. She has extensive experience in disseminating her work internationally. She can be contacted at email: mmohamad@usm.my.

Mageswaran Sanmugam is the deputy director in the Centre for Instructional Technology and Multimedia, Universiti Sains Malaysia, Pulau Pinang, Malaysia. He holds a B.Sc. (Hons) in Electrical Engineering, a Master's in Educational Management, and a PhD in Educational Technology. He taught from 2008-2018 and has been a senior lecturer at Universiti Sains Malaysia since 2018. He is a professional technologist and senior IEEE member, specializing in human-computer interaction, multimedia project management, gamification, AI, and e-learning. He has published over 100 papers. He can be contacted at email: mageswaran@usm.my.

Girija Ramdas a PhD student at Universiti Sains Malaysia, specializes in technology-enhanced learning, instructional design, and digital wisdom in education. Her research identifies principles for educators to practice digital wisdom. She actively contributes to developing applications for digital citizenship, empowering educators with practical tools in an effort to make a significant impact on cultivating a digitally wise generation. She can be contacted at email: girijaram@student.usm.my.