A Usability Testing on Jawi Mobile Application for Standard One Acquisition on Reading and Writing Skills

Siti Shafida Binti Sharifuddin
Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA, Perak Branch Tapah Campus, Perak, Malaysia
2016571913@isiswa.uitm.edu.my

Nur Hasni Nasrudin
Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA, Perak Branch Tapah Campus, Perak, Malaysia
nurha932@uitm.edu.my

Rosida Ahmad Junid
Academy of Language Studies, Universiti Teknologi MARA, Perak Branch Tapah Campus, Perak, Malaysia
rosid716@uitm.edu.my

Article Info

ABSTRACT

Usability testing is one of the most profound product-evaluation methods that can be applied to determine the effectiveness of an innovation, especially how the product invented meets the user's need and expectation. However, the problem is that there are some believes that usability testing is pointless because real users would test the application and report any issue arises. Notwithstanding this belief, the researchers still think that usability testing can highlight the quality of user experience and can answer the question of whether people enjoy the application or not. Thus, this paper will expose the readers to the usability testing that is conducted on a new Jawi Mobile Application that adopts Augmented Reality (AR) technology and used ADDIE research method, which aims to improve Standard One student's skills in reading and writing the Jawi script. Thirty students (30) of standard one aged 7 years old from a chosen primary school were involved in the usability test. The usability test involved questionnaires and observations based on four acceptance test elements. Based on the findings, it is proven that the new Jawi Mobile Application that uses Augmented Reality (AR) Multimedia Elements is a breakthrough innovation which firstly, can help to ameliorate standard one basic acquisition on Jawi reading and writing skills, and secondly can be integrated into the Standard One School Syllabus.

Corresponding Author:
Nur Hasni Nasrudin,
Faculty of Computer and Mathematical Sciences,
Universiti Teknologi MARA, Perak Branch, Tapah Campus
Perak, Malaysia
Email: nurha932@uitm.edu.my

1. Introduction

Nowadays Jawi Learning is slowly being left behind as people are starting to lose interest in Jawi due to their preference towards the Roman script that is widely utilised today. The focus on Roman characters especially in our daily communication has led to the sense of detachment to Jawi learning especially among the young learners in Malaysia. As a result, these younger generations

are alienated from Jawi acquisition especially in the writing and reading skills [1]. Besides the introduction of the Roman characters, another interesting reason behind the negligence in Jawi learning is due to the current teaching methods at schools. The present teaching pedagogy and methodology is said to be "not attractive" [2], [3]. Current teaching methods are still stuck at the use of chalk and board approach and cards [4]. This ineffectiveness of the Jawi learning system is further prompted and claimed by Prof Dr Kang Kyoung Seok, a Jawi Script expert from Korea who later formulated his theory in Jawi learning [5].

Meanwhile, the lack of attractive Jawi learning materials is also another reason that hinders Jawi writing and reading acquisition [1]. Hence, to revitalize and improve Jawi reading and writing skills among the young generations or the new Millenials, it is undeniably important to introduce a new technological-based teaching and learning methods. Educational multimedia courseware ie. The Augmented Reality (AR) is said to be the most suitable and appropriate interactivity teaching tool that has proper interface design which would be suitable for the learners of the designated age group [4] This multimedia elements that are supported with graphics and sounds effect will surely create an interactive learning environment. According to [6] from the research that they conducted, the researchers found that when ICT is used as a learning tool, students get more active and yearn for knowledge as a result of the flexibility and the advancement of the related used technology. AR technology with the multimedia elements can rest assure a different, unique and interactive learning process that requires substantial student's engagement in the most interactive and fun environment [7]. Many research has proven that AR technology has a great impact on the learning grounds especially in the educational fields of science education, social studies, and health education as supported by a 2019 study done by [8],9]. Thus, lack of effective teaching methods, ineffective learning materials available in the market, seen to have a significant correlation with students' achievement in Jawi learning, as supported by [4],[10].

On that note, the researchers believed that the initiative taken in innovating a Jawi Mobile Application using AR technology with aims to ameliorate the teaching and learning of Jawi, is a noble effort in ensuring Jawi Heritage and Knowledge do not deteriorate or fade away with time. This is further supported after the researchers did the usability test on the Jawi application. Based on the answers received from the correspondent, it was further acknowledged that the aesthetic values and maybe later the commercial value, that the innovation has brings lots of benefits and offer great impacts to the development of Jawi acquisition on reading and writing skills for the standard one students.

Therefore, the objective of this paper is to report the usability testing of the Jawi Mobile Appplications on the users from the standard one students. The usability testing is needed as to reaffirm compliance with the user's need and expectations as mentioned above. The findings reported in this paper will give beneficial insight to many researchers and teachers in the utilization of Jawi learning with mobile application and AR technology.

2. Methodology

This section begins with an explanation of the application development and design method. It will cover the software used in application development, the interface design of the application as well as the architecture of JAWI mobile application. Then, followed by the testing setup and procedure which complement the questionnaire and the procedure used in this research.

2.1 Application development and design

The development of this application was guided by the ADDIE model. The application was fully developed using Unity and Audacity. Unity has an Augmented Reality function that can be used to create a game and mobile application features. Meanwhile, Audacity software was used to add and edit sound that will be applied to the application. Since Augmented Reality (AR) has good potential in the education field [11], the Jawi application applied AR technology as a medium to attract and communicate with the users.

The interface design for Jawi application made by referring to the fundamental of usability guideline of User Interface Design [12]. To match between application and the real world, the researcher decided to use a little girl and a little boy with Muslim's attire instead of a teacher to trigger a friendly environment and comfort to the target users who are children. Two characters were purposely designed as actors to explain, guide and response to the user for entire activities in the application. Besides, every button is facilitated with audio to help children to be at ease and would easily understand the button's function and direct the user to navigate from one section to another.

The consistency of layout and button's placement has been emphasized in this design. Furthermore, in the game section, the user will always be encouraged to keep giving the right answer even though the answer is often wrong. All of these design elements will increase user engagement [13]. In the other hand, Malay language chosen as a communication medium in JAWI mobile application as per suit with Malaysian national language [14]. Figure 1 indicates some of the interfaces of the application that were developed.

Figure 1. Effects of selecting different switching under dynamic condition

Figure 2 shows the architecture of the augmented reality application. Generally, it needs four (4) steps to view the output to the user. First, the user needs to download the application and access the application. Second, the smartphone camera will be activated and synchronize with augmented reality screen. Third, the tracking image will be scanning the image, which has been defining as a marker by the application. Fourth, users can see the real view of 3D objects through mobile devices in the real world. Jawi application design for Android platform able to run for all android AR enables smartphones which ARCore (Android) installed.
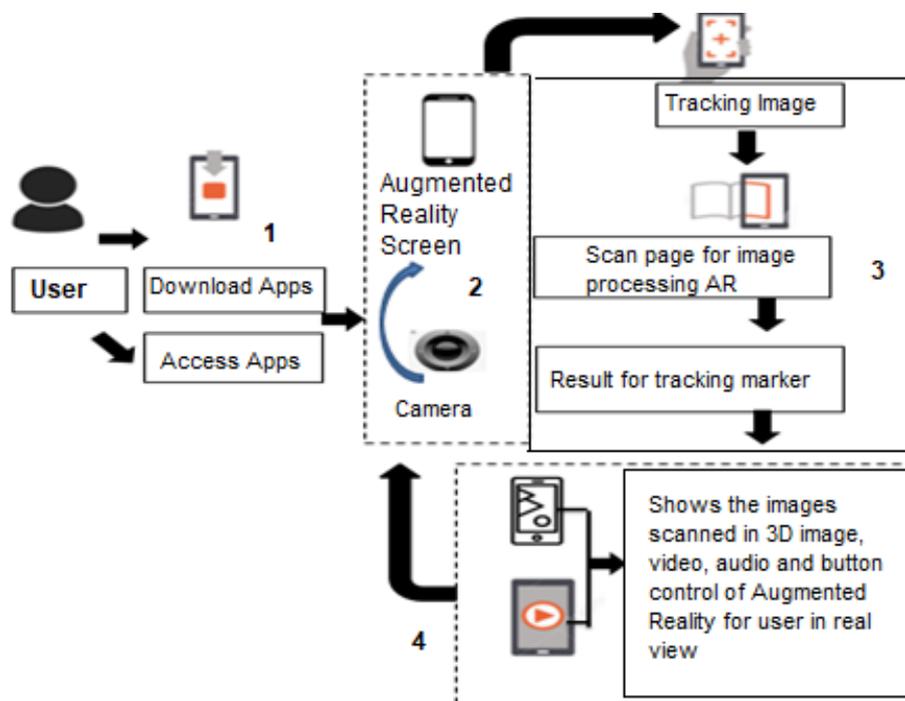

Figure 2. The system architecture of augmented reality application

2.2 Test Setup and Procedure

The researchers decided to conduct the usability test with 30 children age 7 years old. It is because the content of Jawi syllabus in this application is for the standard one, a primary school in Malaysia. Moreover, it is proven that children in this age range are relatively easy to include in software usability testing due to school experience [15].

The researcher emphasized the best way to communicate and gather information from participants. Since the participant is a child, the researcher develops the question in two versions; English and simple Malay as per Table 1, so that it is easy for the child to understand the question and give feedback.

Table 1. Questionnaire questions

English version	Simple Malay version
It is easy to use?	Susah guna atau tidak?
It is user-friendly?	Senang faham atau tidak dengan butang-butang dan gambar?
I can use it successfully anytime?	Kalau nak guna bila-bila masa boleh atau tidak?
It is useful?.	Rasa berguna atau tidak?

Meanwhile, the procedure for this study has properly planed. The researcher understands that most students did not have their smartphone; therefore, the smartphone will be provided to the children. The summary of the testing procedure is depicted in Table 2.

Table 2. The testing procedure

No.	Procedures
1.	The students were provided with a smartphone and cards
2.	Simple explanations about the application were given to the students
3.	The test started with a guide by a researcher
4.	Students' reaction and response were monitored and observed
5.	The researcher asks the students simple questions using simple language
6.	Researcher writes the students answer in the questionnaire forms on behalf of the students.

Before testing session start, the researcher provided simple explanations to the student about the Jawi application and the purpose of the testing. Then the researcher monitored student's response and reaction while using and exploring the application. When the student has done, the researcher approached the student and asked the question from the questionnaire using a simple Malay's word in an informal mode. Then, the researcher records the student's feedback in the questionnaire forms on behalf of the students.

3. Result and Discussion

Figure 3 shows the data results for the Ease of Use of the application. Interestingly, the majority of the participants (children) responded "agreed" to all the four questions. This suggests that the application is pleasant and easy to use when learning Jawi. However, it is interesting to notice that nearly 30% of the respondents are unsure to give their responses for the second and third questions and, thus decided to be neutral. This situation has to lead the researchers to assume that it may be due to their unfamiliarity with the application or the children do not understand the questions asked.
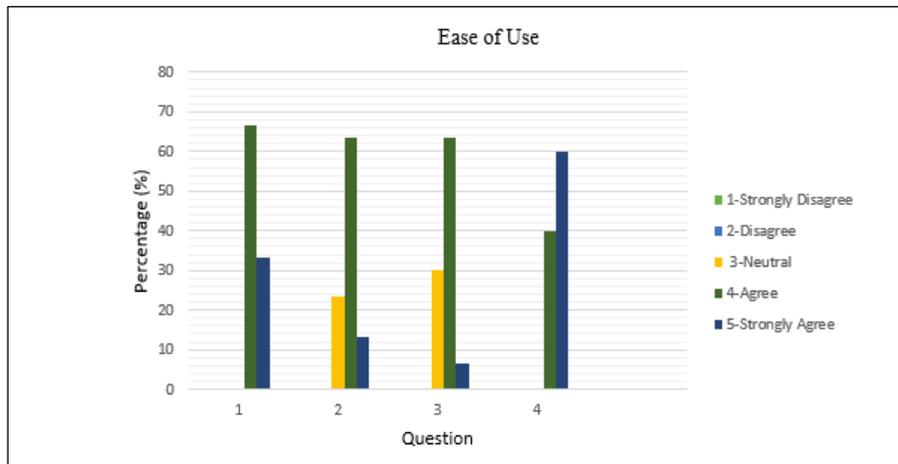
Figure 3. The Result for Ease of Use question.

Figure 4 shows the Ease of Learning results that shows the percentage of the students who answered 3 questions as the following:

i. I learned to use it quickly,
ii. I easily remember how to use it, and
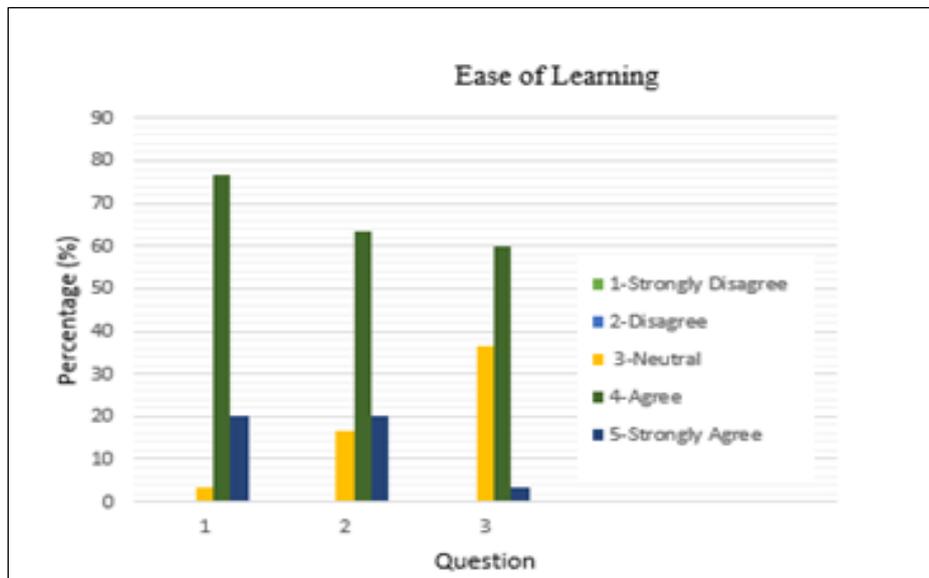ii. I quickly become skilful at using it.

Figure 4. The Result for Ease of Learning

Variety of feedbacks were recorded and the first question has the highest total of participants who agreed, associating that they did learn to use the application quickly. Meanwhile, when the second question was asked, nearly 20% of participants were unsure about what to respond. The researchers found out that this was because the children's answer has been influenced by the children's background and exposure to the smartphone. As for the third question, approximately 40% of the students decided to be neutral and the researchers found that the reasons behind this are quite similar to the reasons in question no 2. The researchers concluded that the learnability of this application is so much influenced by the children's background and knowledge as well as how much exposure they had on the smartphone. The higher the exposure to the smartphone the higher the

learnability probability will be. Figure 5 shows the Satisfaction data result, which consists of three questions as below:

i. I am satisfied with it
ii. It is fun to use when learning with a cartoon (objects appear)
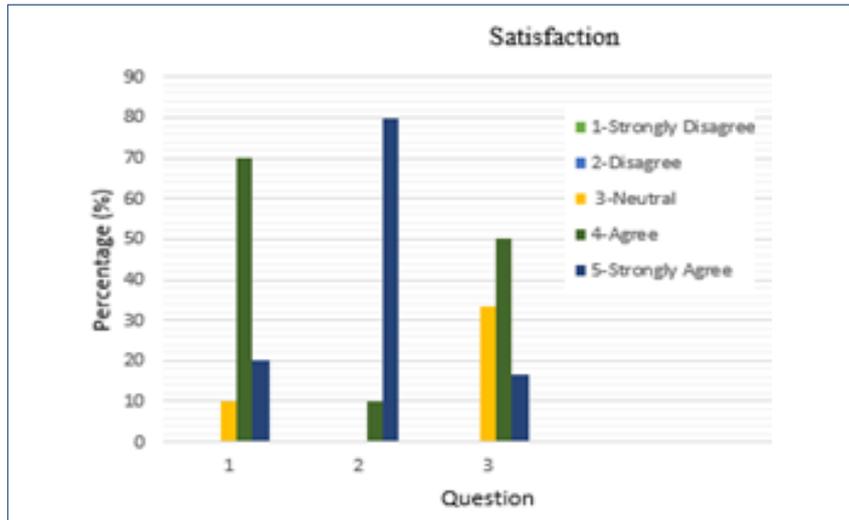iii. I would recommend it to a friend.

Figure 5.The Result for Satisfaction

The first question depicts almost 90% of participants agreed but another 10% was unsure. The children said it is much better if they can handle the characters in the application just like in a game. The researchers considered this comment as an improvement to the system. Then, for the next question, all participants agreed that the application was fun to use with the cartoon characters in the learning process. In other words, the chosen cartoon characters have successfully attracted participants and helped them to acquire Jawi learning in a fun way. For the third question, almost 30% of participants were unsure whether they ought to recommend the application to their friends. Figure 6 shows the Usefulness results, which consists of four questions as below:

i. I become more effective,
ii. I am interested to use it in school,
iii. It helps me to understand more about Jawi quickly than in school and
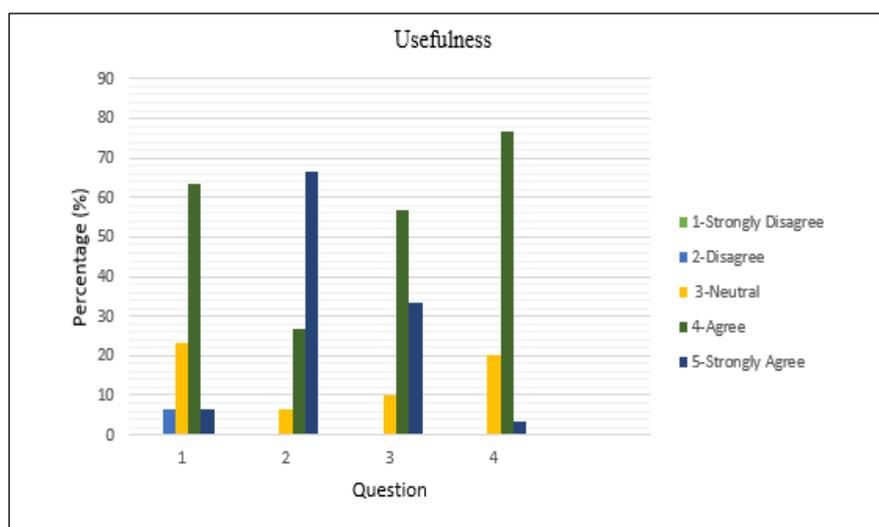iv. It helps me to practice Jawi skills in the study.

Figure 6. The Result for Usefulness

For the first question, one participant does not agree; however, the participant does not reveal his reasoning for his disagreement. Then, for the second question, the same participant is unsure to use it in school. Interestingly, he said the reason is he has no smartphone to install this app. His honest reason has to lead the researchers to conclude that it is not because of any drawbacks of the application for not wanting to use it at school, but it is solely due to the facility needed to install the app is not in existence. Whereas, for the third question 90% of participants agreed that this application helps them to understand more about Jawi and 80% of participants agreed that the application helps them to practice Jawi skills in their acquisition process. This data result is sufficient to defend the usability requirement of this application which has successfully achieved its mission.

4. Conclusion

Mobile Application with Augmented Reality features implemented in this innovation has proven that the deployment of the latest technology has helped to necessitate the Jawi learning processes. The results of usability testing were very positive and this indicates that the innovation with the latest AR technology has ameliorated young learners Jawi reading and writing skills. It is proved that technology can facilitate education as mention by [16]. Hence, the mobile augmented reality application offers many benefits over traditional methods and fascinatingly. It can be noticed that students' love and admiration towards Jawi learning have increased when they werein a fun learning environment of the mobile application, which can be used anywhere. As this Jawi application was created in the Android platform, it cannot be installed and run in the iOS platform. Therefore, in the future, the Ja wi application can be extended to be developed compatible in other platforms, including iOS platform.

References

[1]   N. M. Diah, M. Ismail, S. Ahmad, and S. A. S. Syed Abdullah, "Jawi on Mobile devices with Jawi wordsearch game application," *CSSR 2010 - 2010 Int. Conf. Sci. Soc. Res.*, pp. 326–329, 2010.

[2]   N. Rosila, N. Yaacob, P. Pengajian, and I. Pendidikan, "Penguasaan Jawi Dan Hubungannya Dengan Minat," *Pendidik dan Pendidik.*, vol. Jil. 22, pp. 161–172, 2007.

[3]   N. A. Abdullah, R. H. R. A. Kamaruddin, Z. Razak, and Z. M. Yusoff, *A Toolkit Design Framework for Authoring Multimedia Game-Oriented Educational Content*, 8th IEEE I. New York.: IEEE Press, 2008.

[4]   N. Mat Diah, M. Ismail, P. Mazliana Abdul Hamid, and S. Ahmad, "A Development of a Computer-Assisted Software (AJaW) That Encourages Jawi Writing for Children," *Education*, vol. 2, no. 5, pp. 130–135, 2012.

[5]   Faisal, A. Faisal, A. Hamid, Faizuri, and A. Latif, "Sejarah Perkembangan Tulisan Jawi: Analisis Mengenai Teori Kang Kyoung Seok (Historical Development Of Jawi Script: Analysis To Theory Of Kang Kyoung Seok)," *J. al-Tamaddun*, vol. bil 9 (2), no. 2009, pp. 1–15, 2014.

[6]   M. Z. Abd Rozan, Y. Mikami, A. Z. Abu Bakar, and O. Vikas, "Multilingual ICT Education: Language Observatory as a Monitoring Instrument," *South East Asia Reg. Comput. Confed. Conf. 2005 ICT Build. Bridg.*, vol. 46, no. June 2014, pp. 53–61, 2005.

[7]   M. Kesim and Y. Ozarslan, "Augmented Reality in Education: Current Technologies and the Potential for Education," *Procedia - Soc. Behav. Sci.*, vol. 47, pp. 297–302, 2012.

[8]   D. N. E. Phon, M. B. Ali, and N. D. A. Halim, "Collaborative Augmented Reality in Education: A Review," in *2014 International Conference on Teaching and Learning in Computing and Engineering*, 2014, pp. 78–83.

[9]   A. E. Kiv and M. P. Shyshkina, "AREdu 2019 – How augmented reality transforms to augmented learning," *Augment. Real. Educ.*, pp. 1–12, 2020.

[10]   M. A. H. Mohammad, "Mobile Applications' Impact on Student Performance and Satisfaction," *Turkish Online J. Educ. Technol.*, vol. 14, no. 4, pp. 102–112, 2017.

[11]   Ö. KOÇAK, R. M. YILMAZ, S. KÜÇÜK, and Y. GÖKTAŞ, "The Educational Potential of Augmented Reality Technology: Experiences of Instructional Designers and Practitioners," *J. Educ. Futur.*, no. 15, pp. 17–36, 2019.

[12]   A. S. Badashian, M. Mahdavi, A. Pourshirmohammadi, and M. M. nejad, "Fundamental Usability Guidelines for User Interface Design," in *2008 International Conference on Computational Sciences and Its Applications*, 2008, pp. 106–113.

[13]   C. Peters, G. Castellano, and S. de Freitas, "An exploration of user engagement in HCI," 2009, p. 9.

[14]   N. B. Mahadir, Z. J. Osman, N. Thambu, and T. B. Piang, "Malaysian Unity and Integration Aspiration: Enhancing Cultural Inclusiveness through Investigating Minority Group Identity Experiences," *Int. J. Acad. Res. Bus. Soc. Sci.*, vol. 9, no. 10, pp. 51–66, 2019.

[15]   Libby Hanna, Kirsten Risden, and Kirsten Alexander, "Guidelines for Usability Testing with Children," *Interaction*, vol. 4, no. 5, pp. 9–14, 1997.

[16]   A. A. Sakat, M. Z. M. Zin, R. Muhamad, A. Anzaruddin, N. A. Ahmad, and M. A. Kasmo, "Educational technology media method in teaching and learning progress," *Adv. Nat. Appl. Sci.*, vol. 6, no. 3 SPECL.ISSUE 2, pp. 484–489, 2012.