e-Bimbing Solat: The Development of Augmented Reality Digital Content to Enhance Learning Experience for Patients to Perform Prayers

Mohd Hatta Mohamed Ali @ Md Hani[1]*, Nurul Fatin Athirah Ismail[1], Dina Safiah Abdul Rahman[1], Ainnur Diyanah Ahmad Zaini[1], Sam Faheeda Abdul Samad[2]

[1]Department of Information Technology, Centre for Diploma Studies,
Universiti Tun Hussein Onn Malaysia, Pagoh Higher Education Hub,
84600 Pagoh, Johor, MALAYSIA

[2] Human Resource Division, Registrar Office, Universiti Tun Hussein Onn Malaysia,
86400 Parit Raja, Johor, MALAYSIA

Abstract: Every Muslim is obliged to perform prayers in any situation, including when someone is sick. The method of performing prayers for the sick is different. Since it is rarely practiced then we tend to seek information about it. Unfortunately, most of that information is not produced in digital content. Therefore, this study was conducted to find new methods that are more effective in knowledge delivery. Through the rapid development of digital technology, it has triggered the phenomenon of information search more effectively. The use of mobile devices with the integration of Augmented Reality (AR) technology will further aid the patient's understanding in learning to perform prayers. Augmented Reality allows users to view 2D or 3D virtual objects projected against the real world. Next, this study also identifies the factors that can improve the understanding of learning how to pray for patients according to the differences in the learning experience by users before and after using augmented reality mobile applications. The methodology that has been used to develop this study is by using the ADDIE model. The results of the development of this study were tested by former patients who were experienced in performing rukhsah prayers and 46 public users using augmented reality mobile applications answered before and after the online questionnaire. The results show that using augmented reality mobile applications can enhance their learning experience. It is hoped that the success of this study can be applied in various fields and commercialized.

Keywords: Mobile Learning, Augmented Reality, Learning Experience, Patient Perform Prayer

1. Introduction

1.1 Augmented Reality

E-learning is online learning that has more complete information as it has evolved entirely in the internet by using electronic technology to deliver learning materials [1] [2]. Augmented Reality (AR) is one of the new technologies that is growing rapidly as a result of its effectiveness, especially in the field of education that applies the use of AR in learning to increase interest in learning [3] [4]. The development of AR technology can enable learning outside of classroom time by creating learning experiences that are linked to the formal classroom [5] [6]. Moreover, it allows the addition of physical display tools with annotations and virtual illustrations that can enhance students' understanding in the classroom [7]. There are various technologies that have AR such as the Zappar app that can be used in education. This Zappar application is an application where the user only needs to scan the code from the code already in the pocket book and the screen will display the information in the form of videos, photos, animations, and 3D models that need to be used. Therefore, e-learning is very suitable and good when combined with technology such as AR because it can make learning sessions more fun and interesting. The use of technology in delivery in the field of learning has long been practiced. AR technology also uses real -world metaphorical interfaces to perform manipulations replacing input devices and is capable of seamlessly transitioning between reality and virtual. AR has the potential to bridge the gap between formal and informal learning contexts [8]. Preliminary evaluation of projects using AR technology shows that such a learning environment has a positive effect and influences good motivation in learning [9]. Thus, the existence of AR technology in the world of education has successfully added another form of teaching and learning media that is more effective as an alternative that can be utilized by students. In learning situations that require students to describe objects that are difficult to obtain, AR technology can help students cognitively to visualize objects through the representation of 3-Dimensional (3D) virtual objects. The use of AR is a new form of experience as an alternative to teaching and learning in education that is interesting and effective [10].

1.2 Prayer

In Islam, prayer is the foundation and pillar of the religion which is the second pillar of Islam. To be believers, prayers must be established perfectly and at the same time, it will help us to be close to Allah SWT. The effect of performing prayers is to refrain from committing heinous, evil, and sinful acts [11]. Therefore, the obligation in performing prayers can have a positive effect on the course of life of every human being. Prayers should be performed in any situation even in a state of illness. They still have to perform prayers according to their ability without leaving the pillars of fi'li in prayer except in case of illness. This is based on a hadith, narrated by Imran bin Husain RA to the Prophet SAW: "Pray by standing if you are not able to stand you may sit, if you are not able to sit, you may lie down" [12]. When a person is given the privilege to perform prayers according to his ability, it is proof that Islam is a beautiful religion because this privilege that we call "rukhsah" is given by Allah SWT to His servants so that they can still perform prayers. Rukhsah literally means ease, or rest for the mukallaf (person in charge) in carrying out the command of Allah in certain situations due to difficulties in affairs and reasons that allow exceptions for prayers. Word of Allah: And Allah does not place in religion any of the burdens. (Al Haj: 78). Allah is Most Merciful to His servants and therefore gives flexibility to perform prayers for the sick by shortening the four rak'ah prayers to two rak'ahs (qasar), and collecting two obligatory prayers in one first time ('jamak taqdim') or performing the second -two obligatory prayers at the time of the second prayer ('jamak takhir') to ease the patient's own affairs. The law of performing short and plural prayers is important and this proves that Muslims can perform prayers in any situation and Islam is a religion that does not burden its people because most patients are not alone in facing various difficulties. There are several forms of rukhsah for praying in critical situations that can be applied by patients such as standing and sitting in prayer, sitting on a chair, sitting cartilage,

sitting cross-legged, sitting iftirasy, lying on someone's back, lying on someone's side, tayamum and also abbreviated plural prayers. [13].

Islam never uses illness as an excuse to let a person not perform prayers [14]. This is clear with the guidelines that have been given by Islamic law based on the Quran and the sunnah of Prophet Muhammad S.A.W. The main factor that patients always give various reasons, among them is that they do not know the procedure of performing prayers when they are sick or know how to pray, but are not confident and forget to cause reasons for them not to pray with uncomfortable conditions [15]. This situation is due to the attitude of people who do not care about the importance of prayer for Muslims due to a lack of motivation in themselves. Furthermore, in a pandemic situation in a COVID-19 outbreak, new norms need to be adhered to especially in hospitals where family members are unable to visit or accompany patients. As a result, there is no referral for patients who lack knowledge of how to pray when ill. This causes patients to feel hesitant when they want to perform prayers and eventually decide not to perform prayers. These factors make it difficult for patients to perform prayers and we must find a solution by looking for other alternatives.

1.3 Studies on Patient Prayer Applications

Table 1: A Comparative Study of Elements in Patient Prayer Learning Applications

Item	iBantu Solat	Panduan Solat Orang Sakit
Audio Recitation in prayer	Yes	No
Content information in prayer	No	Yes
Method of learning	Video (Download)	Image
Icon		

From our observations, it is found that there is not much digital content that provides information and methods to guide rukhsah in prayer during illness. **Table 1** shows the differences between these applications. iBantu Solat application and Panduan Solat Orang Sakit applications related to guidance on how to pray when sick have been compared with knowing the advantages and disadvantages of such applications. Each application has its own advantages and disadvantages.

All the shortcomings in the existing applications will be improved in e-Bimbing Solat Patient through the use of AR which uses Zappar to improve the understanding in performing prayers for patients. Along with the development of digital technology, we can take the opportunity to innovate the learning of rukhsah prayers for Muslims, especially among patients. Therefore, we took the initiative to create a pocket book and video to show the differences from other prayer applications during illness. With this initiative, we are able to motivate consumers in more effective knowledge delivery. Overall, the project was developed using AR technology in the Zappar application to increase understanding in performing prayers and can be used as reference material for patients. This differentiates it from apps available on Google Play and the App Store in learning the basics of how to pray when sick. Our project has many advantages over other applications because our project uses a mobile application that allows users to read, listen to audio, and have real -time AR concepts and videos. For example, our prayer guide video when sick does not need to be downloaded like other applications because when the user selects the desired prayer video, the screen will display our YouTube Channel which is 'Panduan Solat Ketika Sakit'. Other apps like the Sick Prayer Guide app can only read but don't have audio and video like our project. That is a bit about the advantages of our app and the disadvantages of other prayer apps when sick.

2. Materials and Methods

The ADDIE model is used to build the AR User E-Learning Prayer Guide utilizing Zappar. As illustrated in **Figure 1**, the ADDIE model comprises Analysis, Design, Development, Implementation, and Evaluation.

Figure 1: The ADDIE model [16]

2.1 Analysis

In the analysis phase, the study begins by identifying common problems that need to be solved and analyzing the needs to build the project and collecting all the data needed to make the study. As a result of the analysis of this study, there are problems in the knowledge aspect in learning about rukhsah prayers which if improved are believed to affect the learning and knowledge of users. The selection of ways to solve the problem statement was discussed and found that the user learning experience based on AR as well as appropriate videos can improve the understanding for users to learn to perform prayers when sick. We found many observations illustrating how patients were unable to perform prayers perfectly when ill in the hospital without the help of others because their caregivers were not allowed to visit. This incident prompted us to take action to address the issue. Therefore, the project has been developed with AR using the Zappar App. Where we did research and decided on the use of Zappar as the appropriate tool and material for developing AR. The operating system is open-source and free for Android and iOS users to penetrate more users besides patients to learn and take the opportunity to commercialize this app.

2.2 Design

In the design phase, all the information that has been collected from the Analysis phase is translated into a learning plan. This phase describes the overall design and internal filling of the application and some design examples. **Figure 2** shows a pocket book about the steps in Prayer and its description in more detail and has provided Zappar code in each type of prayer for users to scan the code according to the prayer they want. The Zappar menu also shows pictures of steps in prayers and includes a prayer video.
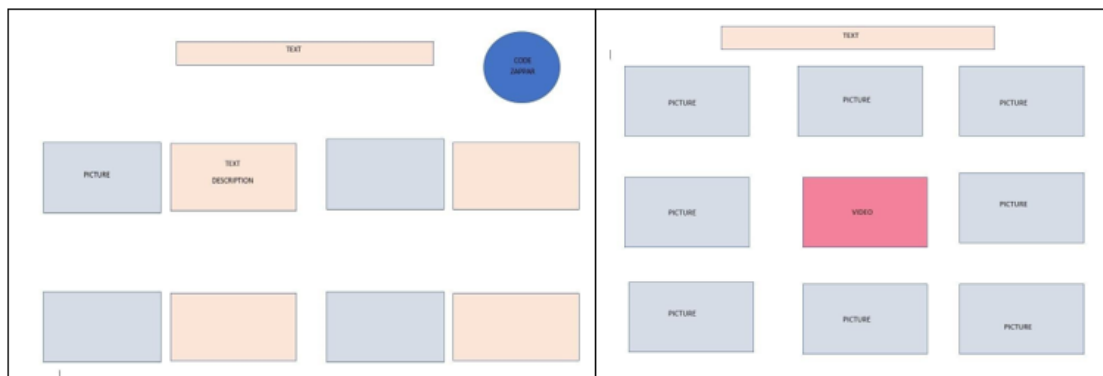

Figure 2: Pocket Book and Zappar Menu

2.3 Development

The Development Phase is about expanding different designs into functional products. The main software used is Zap works Studio which enables the creation of fully customizable AR content. Next up is the Adobe Illustrator application where every digital content for a pocketbook can be edited and compiled for each rukhsah of prayer. The video was edited using the Filmora and Inshot applications and then uploaded on a special YouTube Channel called 'Panduan Solat Ketika Solat'. **Figure 3** shows designing a pocket book in Adobe Illustrator, editing Zappar menu in Zapworks, editing video in Inshot application and uploading video in YouTube channel.
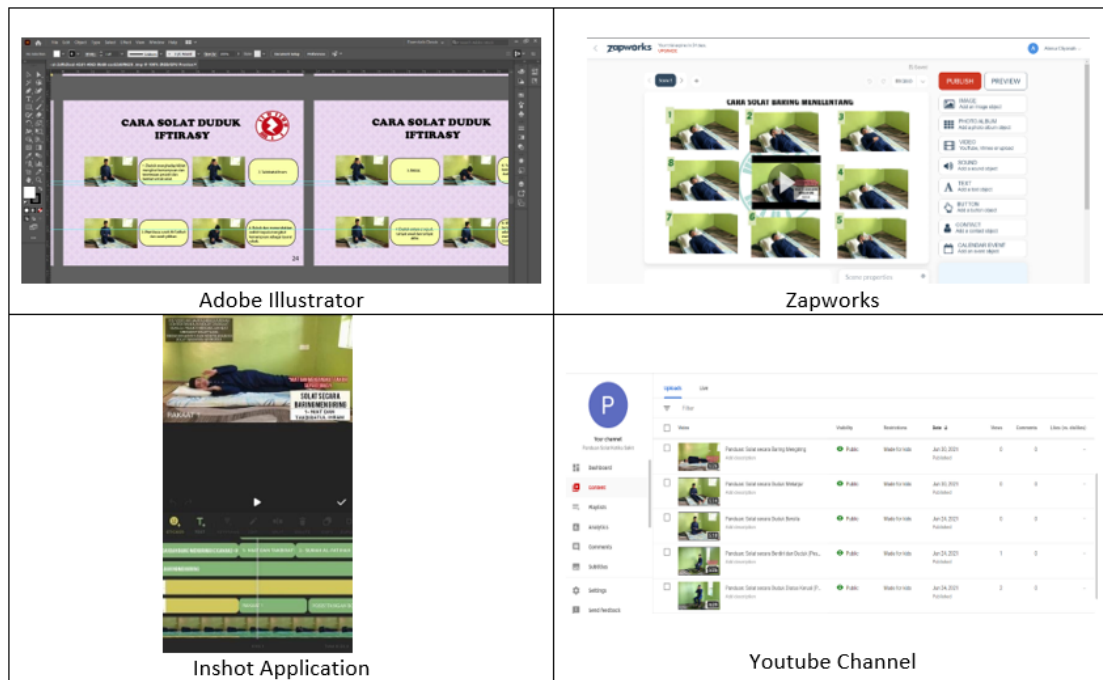

Figure 3: Designing Pocket Book, Editing Zappar, Editing Videos and YouTube Channel

2.4 Implementation

This phase delivers the complete application for testing using a pocketbook that can be scanned by the user using the Zappar application as shown in **Figure 4**.
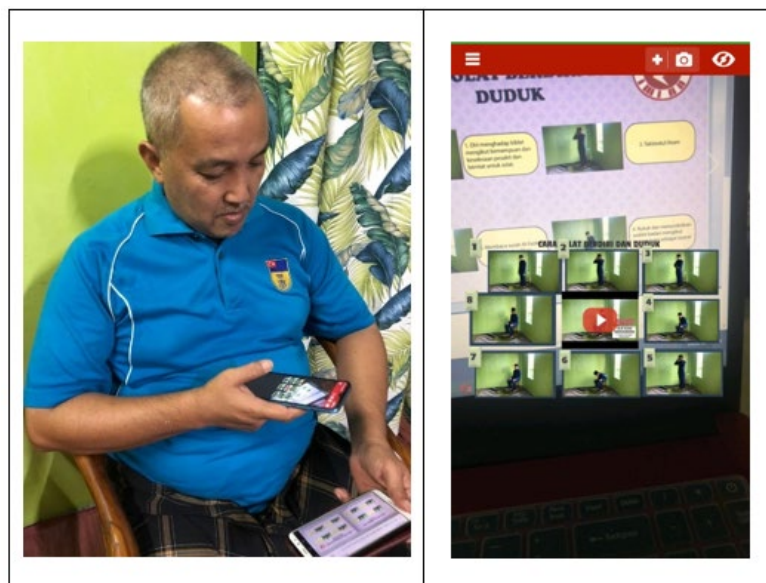

Figure 4: User scan Zappar code using Zappar application

2.5 Evaluation

This phase lets us know whether e-Bimbing Solat can increase knowledge of prayer during sickness. The effectiveness of e-Bimbing Solat was measured through an online questionnaire method that was implemented using Google Forms on respondents by three former patients who had been in the hospital and 46 public users who wanted to learn and add knowledge about rukhsah prayers.

3. Results and Discussion

Table 2: Questionnaire result of respondent

Question	Scale		
	Disagree	Agree	Strongly Agree
The use of M-Learning can improve understanding of how to pray when sick.	0	4	45
e-Bimbing Solat improve understanding of how to pray when sick.	0	3	46
Interface and interaction in e-Bimbing Solat attract interest effectively.	0	7	42
e-Bimbing Solat is an effective learning tool.	0	7	42

Table 2 summarises perception of respondents regarding M-learning, as well as usefulness, attractiveness, and effectiveness of the application after using it. Overall, the feedback obtained was very positive. Throughout the testing session, former patients and public users were very happy with the application. They stated that this is their first time learning rukhsah prayer while ill-using AR in a mobile application, and it improves learning about rukhsah prayer as it is easy to use.

4. Conclusion

The objective of our project is to help the patient's understanding in performing prayers when sick. The AR concept in the e-Bimbing Solat app that uses the Zappar app is a good alternative as users only need to scan the code in the pocket book according to the desired type of prayer as opposed to traditional learning from the book. Attractive colors, graphics, text and audio (every step in the prayer can be heard along with the recitation in the prayer) strongly support visual, audio and kinaesthetic (VAK) based learning styles that will facilitate comprehension in learning because the use of attractive color combinations is one important factors for attracting users [16]. In addition, the elements of its use are reality and virtual in the Zappar app with the help of AR in 3D which makes it interesting because it has movement. The use of elements in this application helps a clearer understanding during the learning process and remembering them more easily [17]. Each rukhsah prayer performance is taken from authentic references such as hospital websites, journals, MyHEALTHKKM YouTube channel, and the mufti's website. e-Bimbing Solat has been proven to improve understanding in learning to perform prayers when sick. e-Bimbing Solat can be improved by adding how to perform fardhu prayers.

Acknowledgement

References

[1]   D. Oblinger and B. Hawkins, "The Myth about E-Learning", *Educase Review*, vol. 40, no. 4, pp. 14–15., 2005. Available: https://er.educause.edu/articles/2005/1/the-myth-about-elearning.

[2]   M. Abbad, D. Morris and C. De Nahlik, "Looking under the Bonnet: Factors Affecting Student Adoption of E-Learning Systems in Jordan", *The International Review of Research in Open and Distributed Learning*, vol. 10, no. 2, 2009. Available: 10.19173/irrodl.v10i2.596.

[3]   S. Bronack, "The Role of Immersive Media in Online Education", *The Journal of Continuing Higher Education*, vol. 59, no. 2, pp. 113-117, 2011. Available: 10.1080/07377363.2011.583186.

[4]   H. Wu, S. Lee, H. Chang and J. Liang, "Current status, opportunities and challenges of augmented reality in education", *Computers & Education*, vol. 62, pp. 41-49, 2013. Available: 10.1016/j.compedu.2012.10.024.

[5]   H. Wu, J. Krajcik and E. Soloway, "Promoting understanding of chemical representations: Students' use of a visualization tool in the classroom", *Journal of Research in Science Teaching*, vol. 38, no. 7, pp. 821-842, 2001. Available: 10.1002/tea.1033.

[6]   E. Peters, F. Wendy, A. Leonard, L. Richard, C. Rebecca and C. Margaret, "Modeling Augmented Reality Games with Preservice Elementary and Secondary Science Teachers", *Journal of Technology and Teacher Education*, vol. 19, no. 3, pp. p303-329, 2011. Available: https://eric.ed.gov/?id=EJ944276.

[7]   F. Muhammad Pozi and F. Khalid, "Kesan Teknologi Augmented Reality Dalam Pendidikan Terhadap Peningkatan Motivasi Pelajar.", *Prosiding International Conference on Global Education V Universiti Ekasakti, Padang Indonesia*, vol. 10-11, pp. 1199- 1208, 2017.

[8]   S. Sotiriou and F. Bogner, "Visualizing the Invisible: Augmented Reality as an Innovative Science Education Scheme", *Advanced Science Letters*, vol. 1, no. 1, pp. 114-122, 2008. Available: 10.1166/asl.2008.012.

[9]   N. Sapri and F. Khalid, "Keberkesanan Teknik Augmented Reality (AR) Dalam MeningkatkanKefahaman Konsep Asas Matematik", *Persidangan Kebangsaan Amalan Terbaik Pelajaran dan Permudahan (Pdpc) & Inovasi*, vol. 14-15, pp. 1046-1047, 2019.

[10]   F. Deraman, I. Suliaman and F. Ahmad Shah, "Sunnah Nabi: Realiti dan Cabaran Semasa", *eprints.um.edu.my*, 2011. [Online]. Available: http://eprints.um.edu.my/2015/1/ Buku_Sunnah_Nabi_%28Realiti_dan_Cabaran_Semasa%29.pdf.

[11]   "Cara Solat Ketika Sakit", *Hospital Baling*, 2013. Available: https://hbaling.moh.gov.my/v3/modules/news/article.php?storyid=2. [Accessed 31 July 2021].

[12]   M. Ishak and B. Ibrahim, "Form of Rukhsah For Prayer in Critical Situation", *International Journal of Academic Research in Business and Social Sciences*, vol. 10, no. 4, pp 359-370, 2020. Available: 10.6007/ijarbss/v10-i4/7139.

[13]   B. Ibrahim and B. Abdullah, "Sikap Pesakit Terhadap Solat: Kajian Kes di Hospital Kuala Terengganu", *Prosiding Seminar Penyelidikan Dalam Pengajian Islam*, pp. 67-77, 2007.

[14]   L. Muhamad Ghazali and D. Dato' Dahaman @ Dahlan, 2017. Peranan Jururawat Terhadap Ibadah Solat Pesakit: Kajian Di Hospital Sultan Abdul Halim, Sungai Petani, Kedah. In: *Persidangan Antarabangsa Sains Sosial & Kemanusiaan (PASAK) 2017*. [online] Selangor International Islamic University College (KUIS). Available at: http://conference. kuis.edu.my/pasak2017/images/prosiding/sosiobudaya/09-Luqman-Hakim.pdf [Accessed 27 September 2021].

[15]   D. Brown, "The ADDIE Model", *EdApp*, 2020. [Online]. Available: https://www.edapp.com/blog/the-addie-model/.

[16]   M. H. Mohd Hatta, R. Rosfuzah and A. S. Sam Faheeda, "A Study On Critical Success Factors (CSF) On Mobile Learning Apps That Enhance Learning Experience In Prayers (Solat) Among Students In Johor Religious School,",in *Proceedings of International Conference on E-Learning 2019*, UNIMAS, 2019, pp. 153-160.

[17]   M. H. Mohd Hatta et al., "Adik-Adik Solat: The Development Of Mobile Learning Apps To Enhance Learning Experience In Prayers Towards Education 4.0", in *Proceedings of International University Carnival on e-Learning 2019*, UNIMAS, 2019, pp. 238-242.