

e-Bantu Solat 2D Animation Mobile Application

A Mobile Application as a Guidance to Perform Wudhu and Prayers During Illness

Nurul Syazwani Ghazali
Universiti Kuala Lumpur
Malaysian Institute of Information Technology
Kuala Lumpur, Malaysia
wanighazali96@gmail.com

Suzidiana Sulaiman
Universiti Kuala Lumpur
Malaysian Institute of Information Technology
Kuala Lumpur, Malaysia
suzidiana@unikl.edu.my

Abstract— Prayers are the most important act of worship in the life of a Muslim, whether they are in good health, in pain, or otherwise. One of the rapid developments of telecommunication technology is the development of android smart phone. With a variety of features and applications smart phone are not only used for communication tools, but also can be used to help various human needs such as entertainment media and learning aids. Because of that, some of the Muslims has less time to reading books, or studying religious science especially science of wudhu' and prayer. Some of us do not know the right procedure of wudhu' and prayer according to the guidance of Al-Quran and As Sunnah. Therefore, the aim of this research is to design and develop the mobile application of prayer and wudhu guide in 2d animation video that helps user to learn the right prayer movement during critical situation. This study conducted to identify the factors that contribute to the use of eBantu Solat mobile application. As a result of the findings this research helps to improve the quality of product development through the correct understanding of research methods and writing. This application also very helpful for Muslims to acknowledge the perfect and acceptable way to perform prayers during illness.

Keywords— Islam; mobileapplication; malaysia; kuala lumpur; muslims; illness; learningaids; animation;

I. INTRODUCTION

Mobile application development is regarded as one of the most competent fields in which to apply multimedia technology. Multimedia components include animation, video, and audio, as well as text and graphics, as well as the ability to perform interactivity, allowing for a more efficient learning and understanding process. As compared to traditional realistic learning, the use of 2D animation in mobile applications will gain a lot of popularity quickly [1]. Apple Store, Google Play, Blackberry App World, and Windows Phone Store are only a few of the sites that have the most device downloads. According to a statistic, Google Play categorizes applications into 27 categories, including faith, education, social, and games. However, due to a lack of demand, the implementation of Islamic religious style is still underdeveloped [2]. The proposal will include a brief overview of the eBantu Solat Mobile Application in the context of 2D animation creation. Context of analysis, problem statement, research purpose, research questions, and chapter overview are among the five subtopics covered in this chapter. In general, this subject will provide a

general overview of previous studies that have the same goal in mind when developing this application. The researcher will explain the issues and recognize the flaws in the application that can be improved. eBantu Solat is an application that helps Muslims in Malaysia, as well as anyone who is unable to conduct prayers in a normal manner due to illness, obtain knowledge in an acceptable manner in Islam. This application has six main functions for taking wudhu' and tayamum and performing prayers properly when in an imperfect state of condition or difficult situation such as sitting and lying down.

A. Problem Statement

Many people are unconcerned about how to do wudhu' and pray while they are ill [3]. Current applications take it more lightly to state the usual occurrences of prayer errors during illness. The majority of people are unaware of the situation and are having difficulty obtaining information from reliable sources, as there is currently no such application built in 2D animation video. In Islam, people who are ill are allowed to conduct their wudhu' and prayers according to their skill. If a patient is unable to stand for prayer, Islam does not compel them to do so. However, prayers should be performed in accordance with their unique abilities and capabilities. While there are fewer prayer guide applications that are designed to be interactive and simple to use. Oral learnings and modules can be considered obsolete and repetitive in today's world of modernization. In any difficult case, not everybody has the time to read the pages of a novel. The current application is missing some of the most common prayer errors.

B. Research Objective

- To analyse Muslim in Malaysia has the basic information on how to perform wudhu and prayer in Islam during illness.
- To develop mobile application that can deliver the information effectively with 2D animation video.
- To identify the effectiveness of mobile application in terms of user friendly, interactive and understandable.

C. Research Question

- How did Malaysian Muslims view and respond to Muslim patient movement during prayers?
- How effective is the 2D animation at delivering information through video and increasing awareness among the 64 percent of patients who do not pray five times a day?
- Why has Android been a viable choice for launching a product rather than some other mobile operating system, such as iOS?

II. LITERATURE REVIEW

Today's Muslims must be mindful of the use of technology, which is used as a facilitator. Various pieces of information and experience may be put to better use. The distribution of Islamic practices has been widely expanded due to the availability of technologies that can travel quickly in the internet world. Knowledge should be disseminated to the rest of the world in a more intelligent manner. With a mix of human expertise, the evolution of technology can be accelerated in a positive way. To put it another way, the success of Islamic da'wah is also determined by the extent to which knowledge is disseminated. It is possible to wisely disseminate information by shifting away from traditional learning and toward virtual learning [4]. The rapid advancement of information technology will aid in the transition from traditional to long-term technological usage [5]. It is possible to carry out the process of combining science and technology. The guidance of naqli propositions written in the Quran and the words of the Prophet SAW [6] is used to integrate insight between the advancement of science and technology. Technology advancements can also support the Muslim community's modernity by allowing for the dissemination of information through creative and important publications [7]. It is our duty as Muslims to assist patients in completing the religious argument. Its importance to our Islamic community has grown as a result of this position. The process of system analysis is essential before starting or developing a new system. This is needed for a comparison of existing structures with those that will be planned or developed in the future. Many projects have already addressed the process, but the author only conducted and researched among 4-5 applications that the analysis would use to improve the project's functionality later on. Users must assess the importance of information, comprehension, and accuracy of information, language, structure, references, and theoretical and practical aspects of Android content. The importance of knowledge in determining the quality of an established application is critical. It also be measured based on whether the application presented is clear or otherwise.

A. Teaching and Learning Methods

The component of how information is communicated via this mobile device is also important. This feature is evaluated in this study based on customer acceptance of mobile technology. The section on how users communicate with technology in the absence of a user manual. Users who are too embarrassed to inquire will learn on their own using this technology. Therefore, the use of picture illustrations and the use of the video is necessary to support in lessons activities. Video and audio is a very important element to create a more robust in the application.

- When developing mobile apps, user-friendly elements are a critical component. The level of knowledge access and display is often used to determine user friendliness [8]. The degree and interactivity of how the functionality of each piece of information displayed is also important to consider when designing an application.
- The most critical aspects of application creation are multimedia and mobility. To ensure that these applications help them better understand learning content, audio, visual, video, and mobile elements are included in the design [9]. This aspect would increase the level of knowledge of prayer in general while also increasing the level of knowledge of prayer during illness.
- The most significant factor in the growth of prayer and wudhu guide illness applications is learning outcomes. The parameters are based on the user's level of comprehension of how to properly conduct prayers and wudhu using a 2D animation video. This application allows users to comprehend the essence of the readings, pray, conduct wudhu during sickness, and determine the path of the qibla. Furthermore, learning results can be seen in this application's facets of information, knowledge sharing, development, and user queries. In order to enhance the progress application in the future, user feedback should be collected.

B. 2D Animations

2D vector animated film to use graphic design with digital animation, which is the fusion of manual images on top of a tablet pen, transferred to the screen, and then transformed into digital animation images. Animation videos can be used as both an entertainer and a learning tool [10].

C. Previous Research for application prayers guide

This research aids in the improvement of quality by providing an accurate view of strengths and weaknesses. Through providing input on research methodology and assisting in the expansion of expertise, the author is able to create a high-quality product. Existing references can be found in the field of science, and scientific writing can be defined as serious in its substance.

- Solah Guide During Illness

The application is mainly aim for patients to experience a new interactive 3D environment on how to perform prayers and wudhu in their life. SDGI provide six learning modules. Divided onto two parts which is four modules about prayers and another two about wudhu and tayamum. The procedure or the activity played by the 3d animation development [11]. The main software used for the development is Unity 3D and Autodesk Maya.



Fig. 1. SGDI menu mobile apps



Fig. 2. SGDI mobile apps

- Belajar Bacaan Solat (AR)

This application makes learning prayer readings in AR enjoyable and interactive for primary school students (KAFA). At a young age, students will improve their ability to use technology effectively [12]. Essentially, 'Belajar Bacaan Solat' is a card book that allows users to learn Augmented Reality in a fun way.



Fig. 3. Belajar Bacaan Solat(AR)

- SMART SOLAT

This app offers three different perspectives as well as animation movement. All Rukun recitals and prayers are led by Ustaz Don

Daniyal. Fajr, Dhuhr, Asr, Maghrib, and Isya are the five times for fardhu prayers. There are also purification procedures for wudhu sections. This application included three translation languages: Malay, English, and French.



Fig. 4. SMART SOLAT

A. Comparison Table

TABLE I. MOBILE APPS COMPARISON TABLE

Applications	Methods	Platform	Function
Solah Guide During Illness	-3D animation -2D animation -Audio -Description	- Android	- The content of 3d animation is developed - Shows the few positions in prayer such as sitting and lying down -Guide user to use the apps through audio

Belajar Bacaan Solat (Augmented Reality)	-2D animation -3D animation - Augmented Reality -Audio -Description	-Android version	-Description about KAFA Class syllabus -Having AR experience when scanning the card book that contains markers. -Contain audio to recite the readings. - Direct user to go to the home page -Having quiz of 'BETUL' or 'SALAH'
SMART SOLAT	-2D animation -Audio -Description	-Android -IOS	- Experience 2d animation visualization with audio instructions.

Based on table I, show the result that most of the mobile application are built for android. Result has showed that the use of technology growing rapidly such as animations gained great attention and found to be very effective tool for enhancing learning of individuals.

TABLE II. MULTIMEDIA ELEMENTS COMPARISON TABLE

NO.	TITLE	Text	Image	Video	Audio	Animation
1.	Solah guide during illness	✓	✓	-	✓	✓
2.	Belajar bacaan solat (Augmented Reality)	✓	-	-	✓	✓
3.	SMART SOLAT	✓	✓	-	✓	✓

However, based on table II, it can be concluded that text is the most commonly used multimedia feature. Each element serves a purpose and interacts with the others. As compared to other multimedia components, text is the most basic data form and takes up the least amount of storage space. Using too much text in multimedia is not recommended. This is due to the text's

inability to display details by attracting the user's attention. This isn't to say that the text isn't needed; it just means that it's only included in the most relevant sections. A successful mobile application should include all multimedia elements that make the information type acceptable to the senses of vision and hearing, bringing it closer to our real-world definition. User has the ability to control and animate those elements. Finally, the product that will be developed will include all multimedia elements and will be based on a 2D animation video, making the application more interactive and user friendly.

III. METHODOLOGY

The process of creating a mobile application, especially one based on the concept of education and training, is a difficult one. Many factors must be considered and followed to ensure that the design and development phase runs smoothly and that the objectives are met. A basic, easy-to-use, and systematic stage is required in the production of teaching materials [13]. Analyse, Design, Development, Implementation, and Evaluation are the five stages of the ADDIE model. Because of the model's architecture, which emphasizes repetition for each step, this ADDIE model was chosen to create learning applications. Each process is inextricably linked to the others. The process can be repeated until it is finished if the step link is properly implemented. Workflow in the development of mobile applications as in fig 5 shown below:

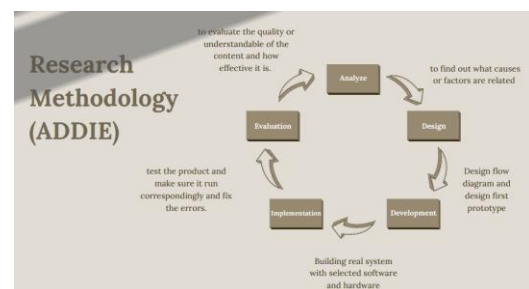


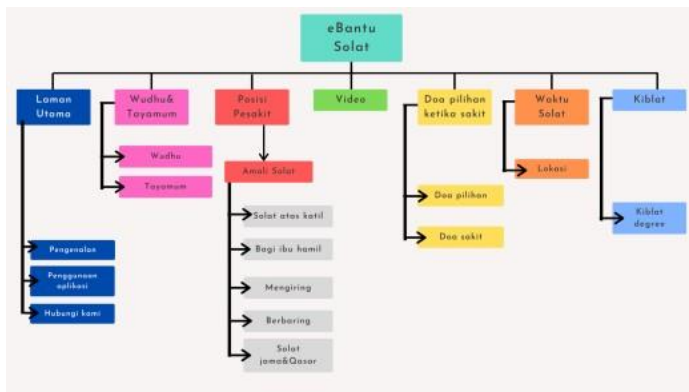
Fig. 5. Process Development of ADDIE Model

1) Analyse phase

At this stage it involves several processes of determination and identification of problems to be solved which is to find out what causes or factors are related or that they have taken the problem. In terms of media used, during this phase 2D animation is more complex than 3d for learning multimedia in mobile apps and it does not acquire big space for memory.

2) Design phase

The design phase will be a guideline of overall ideas and concept for interface, structure, element of multimedia, and technology involved.



3) Development phase

This stage involves building real systems using all selected software and hardware. Each development will be tested to be consistent and be able to operate effectively.

4) Implementation phase

Implementation phase is a role to implement or test against the application produced

5) Evaluation phase

In summative phase, developer improve the project and finally making the application compatible opened to any android users. The summative assessment is done through user reactions. Consumer reactions were assessed through survey questionnaires. The respondent consisted of forty-one people (41) randomly ages between 17-74 years old. The questionnaire form require user to evaluate or rate the applications in terms of design, interaction, and interface. The responses were analysed with the scale rating from highly dissatisfied to highly satisfy.

IV. PROTOTYPE DEVELOPMENT

A. Introduction

This chapter discusses the product development process in specific. As illustrated in Fig 5, the basic approach contains five phases of Analyse, Design, Development, Implementation and Evaluation. Each phase as well interconnected with each other. If one of the phases implemented well, the process can be repeated until it completed.

B. Stage of Prototype

During this phase by using the ADDIE methodology, the developer discovers requirements and constraints in details through phases. During analysis phase, researchers conducted an analysis of the objectives aspects that can be taken out from the current problems. After that in design phase, the developer will come out with flow diagram, interface design, and few storylines on storyboard of 2D animation video. Then, during

development process is to measures the construction of designing the content and programming. The prototype is developed using Adobe Illustrator for designing the characters of 2D animation and interface design of the mobile application. After that, adobe animate becoming the platform to animate all the characters and export into the mp4 video. As in, adobe premiere is used for trimming and design the text and title of the video. Then, all the elements will be imported to Unity 2018.4.25f1 to develop and functioning all the design. After that, during implementation phase, the complete prototype was tested informally to non-target user. Lastly, during evaluation phase, the quality or understandable of the content and how effective it is.

• Colour Scheme

Many developers of website, software or interfaces having difficulties of deciding the design that appear in the prototype. Choosing the right colours will be the hardest part of graphic element as it can be very subjective. The colour must align with the content and must view in target user either it for adults, general public or kids. The developer tested the entire interface look by observed some of the examples from current product that is more suitable for mobile application.

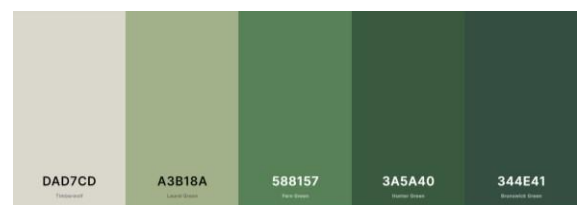


Fig. 7. Final Color

• Font Type Selection

Basically, a font is a group of text characters that can be printed or displayed in a specific style and size. A right type typography can increase readability of information. A tip that need to determine during deciding a typography is to follow brand guidelines of the product. However, it helps developer to stick with the rules of branding model.



Fig. 8. Logo title



Fig. 9. Content font of Waktu Solat



Fig. 10. Title Header

- Button

Everything in life has some basic rules that must be taken into account. The button design is special because it looks quite simply but comes with many factors that must be considered by the designer. Button is very important because it can help users to navigate the product.



Fig. 11. Main Menu button



Fig. 12. Icon button

- Layout

Layout design is the basic branch of graphic design that appealing the arrangement of text and visuals. The effectiveness of mobile application is greatly influenced by the layout. An affective layout not because of the looks, but also help the audience understand the message conveyed by the design. In other words, the layout is key when creating the user- friendly

and attractive designs, especially in the field of web design, mobile apps and advertising.



Fig. 13. Layout

- Graphic

The graphic elements are to represent the explanation about position of prayers during illness.



Fig. 14. Graphic animation movement

V. RESULT AND DISCUSSION

This chapter will describe and analyse the result and discussion of the questionnaire that collected from 41 of respondents. The questionnaire that contain in this chapter is descriptive analysis such as demographic and information of respondents and linear scale measurement.

A. Testing

In this survey, respondent has been asked in Demographic Analysis Section A and Descriptive Data has been asked in Section B aim to explore perception and interpretation respondents about the graphic elements in the mobile applications.

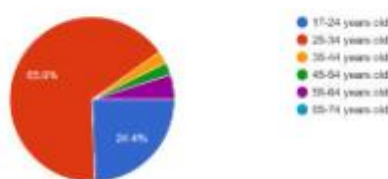
• Demographic Analysis

Questionnaire were distributed online and physical meeting to respondents regardless of their gender and age. Out of 41 group of Muslims respondents who filled out the questionnaire, 63.4% were female and 36.6% were male. However, respondent's age comprised from 24.4% among 17-24 years and 65.9% among 25-34 years and 2.4% among 35-44 years and 2.4% among 45-54 years and 4.9% among 55-64 years and 24.4% among 65-74 years old. All range age participates in questionnaire.

What is your gender ?
41 responses



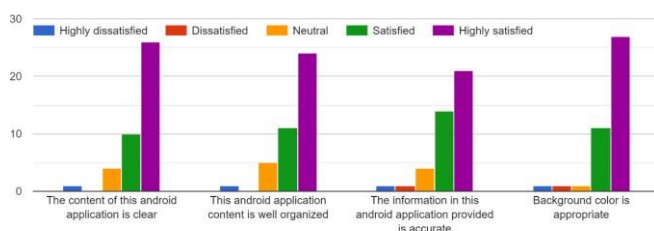
What is your age ?
41 responses



1) Functionality of mobile application in terms of content design

Upon the analysing data from Figure 5.8, it was revealed that 90% of respondents stated that the content of this android application is clear. Besides that, 88% of respondents satisfied that this android application is well organized. However, 86% of respondents satisfied that the information in this application is provided is accurate. And lastly, 89% of respondents stated that background colour used is appropriate.

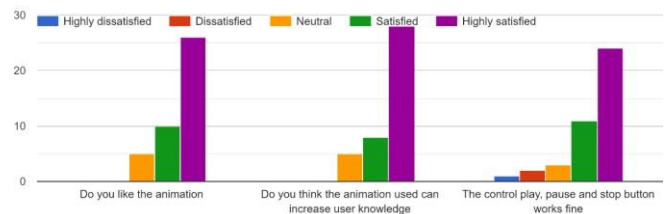
How you rate the content of the design?



2) User acceptance of interaction 2D animation video

As stated on the figure 5.9, 90% of respondent satisfied with the animation. Then, 91% or respondents shows agreed that animation used in mobile application can increase user knowledge. And 87% of respondents satisfied that the control play, pause and stop button works fine.

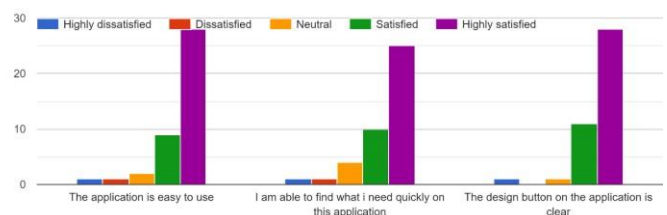
How you rate your acceptance of interaction 2D animation video?



3) Usefulness of the design

Based on figure 5.10, 89% of respondent satisfied that the application is easy to use. And 90% of respondents satisfied that they gather information quickly in this application. In addition, 90% of respondents satisfied that the design button on the application is clear.

How you rate the usefulness of the design?



B. Discussion

The study's hypothesis was that eBantu Solat could create a prayer guide mobile application that could effectively deliver information using 2D animation video. The hypothesis was evaluated based on the results of the questionnaire. 90 percent of respondents were pleased with the mobile apps' interface and content. Based on research question 1, "How did Muslim in Malaysia perceive and relate towards Muslim's patient movement during prayers?" Malaysia's population is over 30 million people. If more than half are Muslims, then imagine how many percent of those who are diligent in studying religious knowledge. I have cited relevant literature review to show how my results fit in. According to Rizky Bajary (2014), Many people has less concerned that prayer is a fundamental of life that we as a Muslim must obliged to perform prayers[14]. Some of us do not pray because it is difficult

to do or even memorize the readings, and others neglect the prayers because they are preoccupied with work or because they are timeless. A random survey was also conducted in a hospital among Muslim women's patients to determine the prevalence of prayers performed among them, according to the study. A total of 100 people are being observed, and only 36% of them pray five times a day, 38% do not pray at all, and 26% only pray once. Their ability to comprehend prayers is severely limited [15]. Furthermore, according to research question 2, "How well does the 2D animation convey information through video and how effective is it for increasing awareness among the 64 percent of patients who do not pray five times a day?" User acceptance of interaction 2D animation video research will increase user awareness, according to developers, and this is the main focus of the design. The most affective aspect of learning is applying animation correctly in educational and know how to handle visual of communication. According to [16], stated that the understanding and application of movement, sound, time, and visual communication interactions will provide the best outcome. Meanwhile, based on research question 3, "Why is platform android become the option to launch the product other than any mobile OS such as iOS?" This was found out on result about 92.7% of respondents are android user. A research studies was made that according to John, Android has manages to capture about 70 percent of the global smartphone market share, whereas Apple only managed to get around 20 percent and the rest was others. In the article it mentions that smartphone sales have increased 38 percent in the latter quarter of 2012, reached 217 million units worldwide, a place of over 700 million, new report analysis from Strategy Analysis. Of this number, 68.3% smartphones use Android, as the operating system. IOS are only around 19.4% because operational system [17]. For the recommendation, in the age that we are living in it. Result has showed that the use of technology growing rapidly such as animations gained great attention and found to be very effective tool for enhancing learning of individuals. In the future I am hoping to gain more respondents as I wanted the data to be more accurate.

VI. CONCLUSION AND RECOMMENDATION

The final chapter of the thesis presents hypotheses based on the study results. It summarizes key findings gleaned from interviews and record review. It concentrates on the study's main findings. This was accomplished by summarizing research questions and demonstrating the research's implications as well as potential future research topics.

A. Future recommendation

This survey presents a compilation of findings from research studies such as eBantu Solat, which genuinely has a lot of functionality to change in order to create a better mobile

application. The respondents' advice is to send the application in both English and Arabic. It can be access to anyone without limitation of languages and it will make the information more understandable. The most highly recommendations are hoping to make the application suitable for iOS user. Some of the respondents also stated that, this application should enter the market such as play store so it could be very useful to every Muslim. I am hoping in the future the application enters play store and apple store also upgrading all the features that contain on every Islamic apps such as Azan, recitation of Al Quran etc. Most importantly, eBantu Solat can be serve as a guide and deliver information widely all around the world.

B. Limitation

The limitation and constraints that occurs before and after development of the project is the data can be more accurate with numerous of respondents that took the questionnaire online and physical. Because of pandemic situation, developer had limited time and area to observe many people. Somehow, the 2D animation content is not playing well at certain smartphone. It shows bug and the playlist button went missing at certain time. Other than that is the Qibla features which developer put so much effort figuring out the problems, and finally gain source from professional software developer.

C. Conclusions

To be summarize that eBantu Solat mainly focused on develop the mobile application of prayer and wudhu guide in 2d animation video that helps community Islam to learn the right prayer movement during critical situation. Based from the research studies there are lack of practices on religious about Rukhsah among patients. During research studies, this kind of application have not exist in android or iOS yet and still lack of numbering application that has same propose have not develop yet. Because of that, Muslims tend to refer the sources from module or google. This is why the percentage of Muslim does not prayers during illness is high because of their lack of ability, it is hard for them to learn at the time. During this time, the concept of making the mobile app more interactive with multimedia elements such as 2D animations, video, text, audio, and graphics was floated. There are many challenges to overcome in the chapters, but the right approach aids me the most. The approach we used has the ability to improve the software's efficiency and quality. This application is designed to assist Muslims in Malaysia, especially those who have difficulty praying in a correct way or who lack the knowledge to conduct prayers in a method that is permissible in Islam based on their abilities. With the presence of information comes the existence of technology, which can be extended to all fields of knowledge and have a thousand and one options for finding the right sources. As a developer of eBantu Solat, in the future I am truly hoping that this application could be very useful to every Muslims around the world, and making the application complete by having all features inside like any other Muslim application.

REFERENCES

- [1] Baglama, B., Yucesoy, Y., & Yikmis, A. (2018). Using Animation as a Means of Enhancing Learning of Individuals with Special Needs. *TEM Journal*, 670-677.
- [2] AZMI, S. B. (OGOS 2013). PEMBANGUNAN APLIKASI PANDUAN SOLAT UNTUK PLATFORM. *Fakulti Komputeran*, 1-88.
- [3] Yusof, N. M., Aziz, F. A., Mustafa, K. B., Awang, M., & Abdullah, A. R. (2018). Practice and Awareness of Salat Obligation during Hospital Admission among. *Revelation and Science*, 24-30.
- [4] Adam, F., Anuar, M. M., & Ali, E. M. (2015). CABARAN MEDIA BARU SEBAGAI MEDIUM PEMBELAJARAN AGAMA DAN PENYELESAIANNYA DARI PERSPEKTIF ISLAM. *Jurnal Islam dan Masyarakat Kontemporari*, 12-23.
- [5] Ahmad, S. F., & Tamuri, A. H. (2010). Persepsi guru terhadap penggunaan bahan bantu mengajar berasaskan teknologi multimedia dalam pengajaran j-QAF. *JIAE: Journal of Islamic and Arabic Education*, 2 (2), 53-64.
- [6] Musa, N., Said, M. H., & Wahab, N. M. (2014). Aplikasi Khusyuk Solat menerusi Pendekatan Teknik Biofeedback = The Application of Devout (Khusyuk) Prayer through the Biofeedback Approach. *Ulum Islamiyyah Journal*, 13(Special Edition), 3-18.
- [7] Othman, H. R., & Massoro, Z. Z. (2014). State of the Art in Publishing of Islamic Children's Books. *World Journal of Islamic History and Civilization*, 4 (2), 35-42.
- [8] Do, Q., Do, Q., & Choo, K.-K. R. (2014). Enhancing User Privacy on Android Mobile Devices via Permissions Removal. *2014 47th Hawaii International Conference on System Sciences*, 5070-5079.
- [9] Liu, Min, Navarrete, C., C., Wivagg, & Jennifer. (2014). Potentials of mobile technology for K-12 education: An investigation of iPod touch use for English language learners in the United States. *Educational Technology & Society*, p115-12.
- [10] Yuliati, T. (2019). METODE DIGITAL ANIMATION DALAM PEMBUATAN FILM ANIMASI 2D VECTOR DENGAN TEMA HARAPAN DAN DOA. *INFORMATIKA* 11(1):71.
- [11] AZHAR, B. B. (2019). SOLAH GUIDE DURING ILLNESS (SGdI). *BACHELOR OF INFORMATION TECHNOLOGY*.
- [12] Ali, M. S., & Zamzuri, A. (2008). Effective Instructional Courseware Design To Improve Students Cognitive Skills: a Practical Guide For Educators As Multimedia Author. *Computer Science*, 245-252.
- [13] Bezerra, H., B. F., & Velho, L. (2005). An image-based shading pipeline for 2D animation. *Computer Graphics and Image Processing*.
- [14] Branch, & Maribe, R. (1977). Instructional Design: The ADDIE Approach: Proceedings of the Second Sussex. *Springer Science & Business Media*, Vol. 722.
- [15] Yusof, N. M., Aziz, F. A., Mustafa, K. B., Awang, M., & Abdullah, A. R. (2018). Practice and Awareness of Salat Obligation during Hospital Admission among. *Revelation and Science*, 24-30.
- [16] Lowe, R., & Mason, L. (2017). Self-generated Drawing: A Help or Hindrance to Learning from Animation? *US: Springer International Publishing*, 309-331.
- [17] Koetsier, J. (28 January, 2013). *venturebeat.com*. Retrieved from Android captured almost 70% global smartphone market share in 2012, Apple just under 20%: <https://venturebeat.com/2013/01/28/android-capturedalmost-70-global-smartphone-market-share-in-2012-apple-just-under20/>
- [18] Kurnia, T. D., Lati, C., Fauziah, H., & Trihanton, A. (2019). MODEL ADDIE UNTUK PENGEMBANGAN BAHAN AJAR BERBASIS KEMAMPUAN PEMECAHAN MASALAH BERBANTUAN 3D PAGEFLIP. *Vol 1, No 1*.
- [19] Liu, Min, Navarrete, C., C., Wivagg, & Jennifer. (2014). Potentials of mobile technology for K-12 education: An investigation of iPod touch use for English language learners in the United States. *Educational Technology & Society*, p115-12.
- [20] MALAYSIA, J. K. (n.d.). *PANDUAN BERSUCI & SOLAT BAGI PESAKIT*. Kuala Lumpur: ATTIN PRESS SDN. BHD.
- [21] Manaf, S. Z. (2015). The User Guide of the Mobile Muslim Prayer Application. *Ulum Islamiyyah Journal*, 43-61.
- [22] Mayhew, & J. D. (1992). *Principles and Guidelines in Software User Interface Design*. Englewood Cliffs: N.J: Prentice Hall.