



Multimedia Mobile Application for Muslim Prayer Guide for Deaf Students

Bambang Robi'in¹ and Zahra Arwananing Tyas²

¹Informstics Engineering Department, University of Ahmad Dahlan

² Information Technology Department, University of Aisyiyah Yogyakarta

Yogyakarta

Indonesia

ABSTRACT

Children with hearing loss are children who have difficulty learning because they have limited language and communication. This limitation hinders them when they study. They need special methods, special media, and special teachers in learning. SLB B Karnnamanohara students have difficulty in learning Muslim prayers (sholat and daily prayers). Almost all grade 2 elementary students cannot pronounce Muslim prayers. They need learning resources that are interesting and according to their needs. Muslim prayer guide mobile application that matches the characteristics of children with special needs. The aim of this study was to build a multimedia mobile application for Muslim prayer guides for children with hearing loss. This application is called M-Shollu.. The method in this study consists of eight stages: data collection, data analysis, create storyboard, prototype design, prototype evaluation, create multimedia, multimedia evaluation, and user experience evaluation. This research has succeeded in designing and developing a multimedia mobile application for Muslim prayer guides for children with hearing loss (M-Sholuu). The evaluation was carried out by multimedia experts and SLB teachers from Carnamanara. The results of M-Sholuu's evaluation were 4.42, out of 5. The multimedia evaluation results carried out by multimedia experts were 4.17 on a scale of 5. The results of multimedia evaluations by Karnnamanohara SLBB teachers were 4.25 on a scale of 5. The user experience evaluation results were 4, 52 on a scale of 5.

Key Words: M-Sholuu, Multimedia, Mobile Application, Prayer Guide, Hearing Loss

1. INTRODUCTION

Children with hearing loss are children who lose the ability to hear as well as the abilities of normal children. These children lose the ability to hear that can occur from birth or in its infancy. The level of disturbance in deaf children can be grouped into severe disorders, moderate disorders and mild disorders. Losing the ability to hear causes the child to never know what sounds or sounds are so that the child also has difficulty producing sounds. In fact, sound is a major component in communication. Understanding of children who are deaf to the language and its use becomes hampered. Hearing disability is different from other people with disabilities, because of other languages that compensate for oral or oral language and are known as sign language [1]. There are three communication techniques that can be chosen by a person with hearing loss, namely sign language, speechreading, or utilizing the rest of the hearing using a hearing aid or with a cochlear implant.

Children with hearing loss need special ways to learn [2]. They need special teachers who know their condition psychologically and to know how to communicate with them, how to say words, and understand them [3]. The curriculum must adapt to meet individual needs and a flexible approach [4]. The limitations of deaf children are of particular concern so that the educational process that needs to be attended by deaf children is different from the educational process in normal children. One educational solution for deaf children is special school part B.

Karnnamanohara Special School Yogyakarta is a special school that provides educational services to deaf children. Children at grade 2 elementary education have the basic ability to communicate using simple Indonesian. Students have the ability to read and write, and have the ability to communicate orally (speechreading). Especially for students who are Muslim, they have difficulty learning about sholat and daily prayers. This difficulty occurs because daily prayers and prayers use Arabic writing. This Arabic

writing when written in Indonesian will experience the difference between the words between writing and how to read, for example the words "ra" will be read "ro". Besides that religious subjects contain more material that is abstract in nature, while deaf children tend to be easier to learn something that is real like objects, places, etc.

Multimedia is a technology that is developing very rapidly. Five multimedia components: text, sound, images, animation, and video are used to convey information fully. Children with hearing loss have an interest in multimedia through smartphone devices that have advanced communication features [5]. Smartphone technology as a mobile device has experienced very rapid development and is part of the daily activities of children in learning activities [6] [7]. The use of smartphones has a positive influence on student learning behavior [8]. In addition, the use of technology both web and mobile will provide a different learning atmosphere for student participants and make learning resources more varied [9]. Recent technological advancements have resulted in many smart smartphone developments [10]. One of the developing modern technologies is application software, commonly known as " apps " for mobile devices [11]. At present there is not much research on the use of smart phones in learning worship for children with hearing loss. This study aims to design and build a multimedia mobile application for prayer study guides and daily prayers for children with hearing loss. This application is called M-sholuu.

2. LITERATURE SURVEY

There are a number of previous studies that can be used as a reference so that the multimedia mobile application of muslim prayer guide for children with hearing loss is proposed in this study.

The research entitled Interactive Multimedia-based Mobile Application for Learning Iban Language (I-MMAPS for Learning Iban Language) [12]. In this study, an interactive multimedia application was developed for learning iban language, namely the language used in the Sarawak area, Malaysia. In this study the application was developed by adopting Conversational method and Constructivism learning theory.

The research entitled Multimedia Mobile Learning Application for Children Education: The Development of Mfolktales [13]. This study aims to design multimedia mobile learning applications for children's education that contain folklore content in Malaysia. The application was developed through 5 stages, namely analysis, design, development, implementation, and evaluation.

Research entitled An analytical study of mobile applications for Hajj and Umrah services [11]. This research focuses on the analysis of applications that are intended for Hajj and Umrah. The research method used is divided into two parts, namely a review process and a case study.

The research entitled Quality Framework for Assessment of Multimedia Learning Materials Version 1.0 [14]. The focus in this research is the development of an instrument to measure the material quality of multimedia learning. This framework is called MLM version 1.0.

The research entitled Design and Development of Multimedia Pronunciation Learning Management System for Non-Native English Speakers [15]. This research was conducted to design and develop a management system for pronunciation learning with multimedia. Application development is done with the ISD Alessi and Trollip model approach.

The study entitled The design and testing of multimedia for arithmetic to deaf teaching learners [16]. This study focuses on how to design and test multimedia applications to teach arithmetic to deaf children.

The study entitled Development of intelligent mobile applications for teaching English pronunciation [10]. This research aims to develop intellegent mobile applications for English pronunciation teaching. The focus of this research is to change the concept of traditional learning into adaptive learning by utilizing smart applications.

Research entitled Assistive Technology for Deaf People Based on Android Platform [1]. This study aims to produce an android-based application that can be used for people with hearing loss.

3. METODOLOGY

The research method consists of eight stages: data collection, data analysis, storyboarding, prototype design, prototype evaluation, multimedia creation, multimedia evaluation, and evaluation of user behavior. Figure 1 below is the step taken in the research.

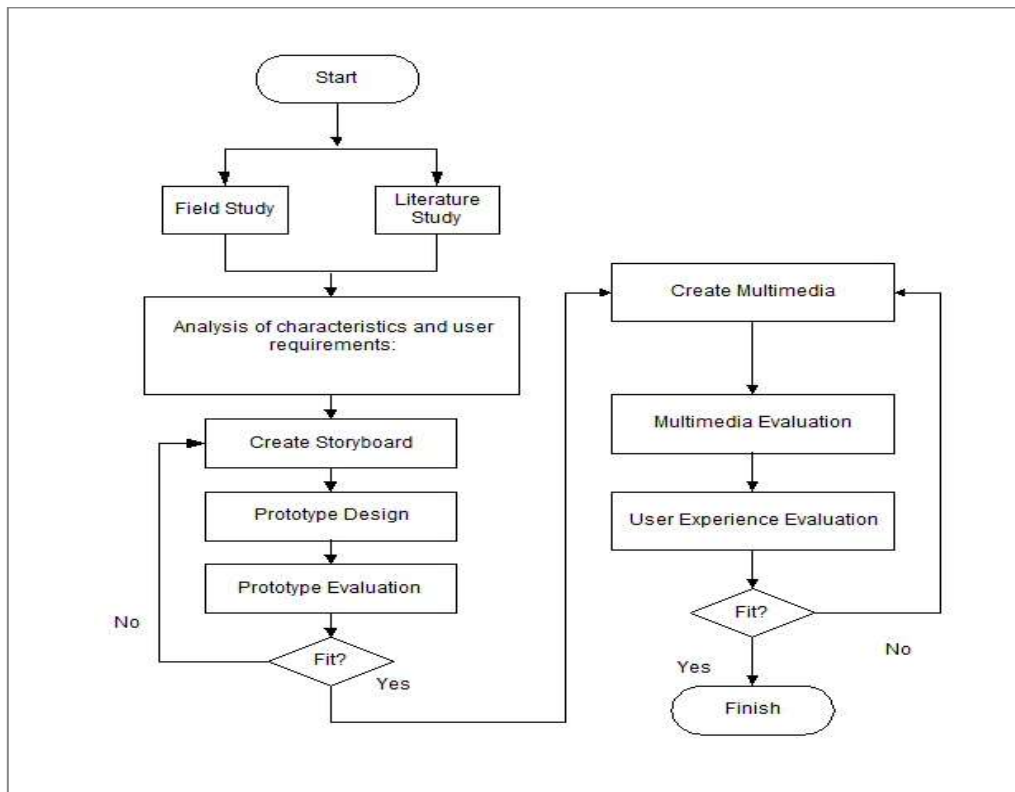


Figure1: Metodology

3.1. Data Collection

At this stage, there are two main activities, namely literature studies and field studies. Literature studies are conducted by studying references that are in accordance with the research topic. This study was conducted to obtain information relating to the topic of research. The field study was conducted with observation and interviews at the Karnnamanohara special school in Yogyakarta. In the field study, observations were carried out on grade 2 elementary students to find out the characteristics of users. In addition, interviews were also conducted with parents and teachers to obtain supporting data.

3.2 Analysis of Characteristics and User Requirements

This stage is the stage of needs analysis which includes two activities, identifying characteristics of user needs and identifying the characteristics of multimedia learning to be made. This stage will produce specifications on user requirements and character specifications for multimedia muslim prayer guides for children with hearing loss.

3.3 Creta Storyboard

The storyboard making stage is to illustrate how a multimedia application will run. The storyboard describes how the multimedia components (text, images, sounds, videos and animations) are applied in the prayer guide and prayer application for children with hearing loss. In making this storyboard refers to the user's need for learning material and multimedia characteristics.

3.4 Prototype Design

The prototype design is the design stage and the making of the M-Sholuu prototype as a mobile multimedia application for Muslim prayer for children with hearing loss. The design and manufacture of this prototype is based on the storyboard that was made before.

3.5 Prototype Evaluation

The prototype evaluation phase is the stage for evaluating the prototypes previously made. This stage is used to assess whether the prorotipe made meets the user's needs. Whether the prorotipe made is in accordance with the specifications of the user needs and the characteristics of the Muslim Muslim prayer guide for children with hearing disorders. If the evaluation results show that the prototype has not fulfilled it, the next step is to redesign until the needs are met. The prototype evaluation was carried out by multimedia experts and Karnamanohara school special teachers.

3.6 Create Multimedia

Creating multimedia is the making of a multimedia application for Muslim prayer learning for children with hearing impairments. This manufacture included the creation of five multimedia component assets and the creation of applications to incorporate multimedia components into the M-Sholuu application.

3.7 Multimedia Evaluation

Multimedia evaluation was conducted to evaluate the quality of M-Sholuu as a multimedia application. The evaluation was carried out by multimedia experts and special teachers at the Karnnamanohara school. Evaluation was also carried out to find out whether M-Sholuu was made according to user needs and according to the design that had been made before.

3.8 User Experience Evaluation

User experience evaluation is done to find out how users react when using the M-Sholuu application. This evaluation is done by observing the behavior of children with hearing impairments when using the M-Sholuu application that involves parents.

4. RESULT AND DISCUSSION

4.1 Analysis

Analysis of user needs is used to find out how the characteristics of user needs and multimedia characteristics. This analysis is done through literature studies and observations in the field. Observations were carried out on elementary school students 2 in the Karnnamanohara special school in Yogyakarta. The results of the analysis are shown in the following table 1.

Table 1. Analysis

Analysis	Result
Characteristics and User Needs	<ol style="list-style-type: none"> 1. Age of elementary school children 2 (9-11 years) 2. All elementary class 2 students are Muslims 3. Has advantages over visualization 4. Using ABM (Hearing aids) 5. The ability to use the rest of the hearing only reaches the stage of sound detection 6. Communicate with lipsreading techniques (reading lips) 7. Low academic ability 8. Already able to read with handwriting type writing 9. Have a little vocabulary, understand language 10. New children learn about prayer to eat and prayer to sleep 11. Children have not yet studied prayer prayer 12. Children have learned the prayer movement 13. Learning methods in the classroom use the MMR method (Reflective Materna Method) and images as illustration media 14. At home the children have practiced the prayer to eat and the prayer wants to sleep but it is still difficult for others 15. Children are used to using an Android phone
Multimedia characteristics	<ol style="list-style-type: none"> 1. Minimizing confusing content 2. Reducing sound effects 3. Reducing narration 4. Accentuate visual elements 5. Segmented content (content sharing) 6. Displays lipsreading video with sound 7. Using handwriting type text 8. Bright and constructive color combinations

The analysis results shown in table 1 are data that will be used to create story boards and application prototypes.

4.2. Menu Design

The application design menu of Muslim prayer guides for children with hearing loss consists of 4 main menus. The two main menus have prayer guides and prayer guides, each of which has a learning sub menu and a quiz sub menu. The design structure of this menu looks like in Figure 2 below.

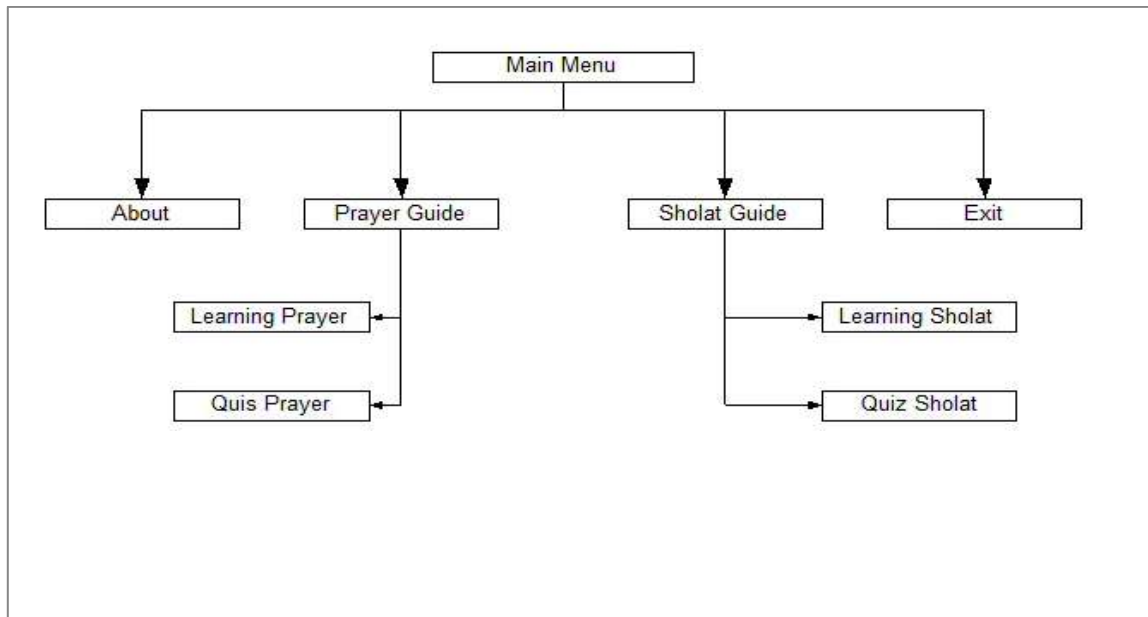


Figure 2: Menu Design

4.3. Storyboard

The storyboard illustrates how the multimedia mobile application of Muslim prayer guides for children with hearing loss will work. This storyboard is designed to show multimedia components that are equipped with graphical directions and information. The following picture 3 is a storyboard design from the main menu, sholat guide, and prayer guide.

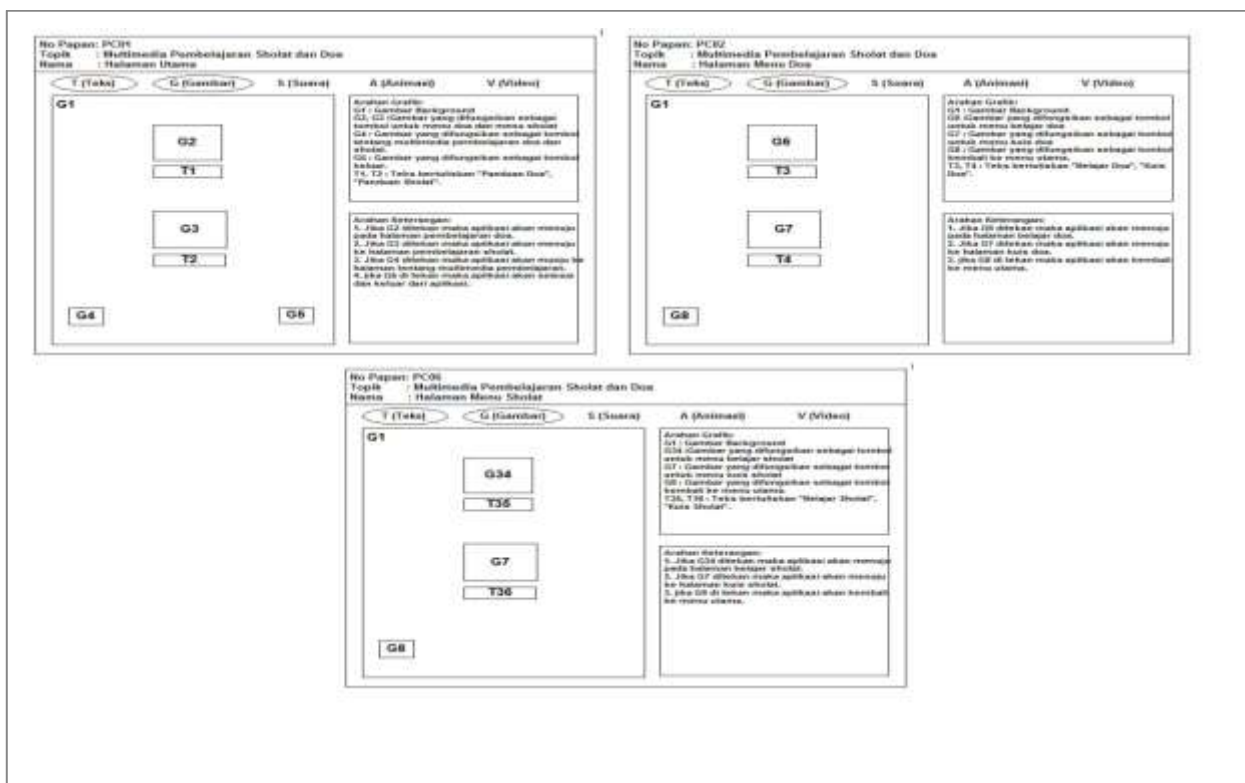


Figure 3: Storyboard of Main Menu

On the prayer guide menu there are three pages. Learn prayers, details, prayers, and prayer quizzes. The storyboard from the prayer guide looks like in Figure 4 below.

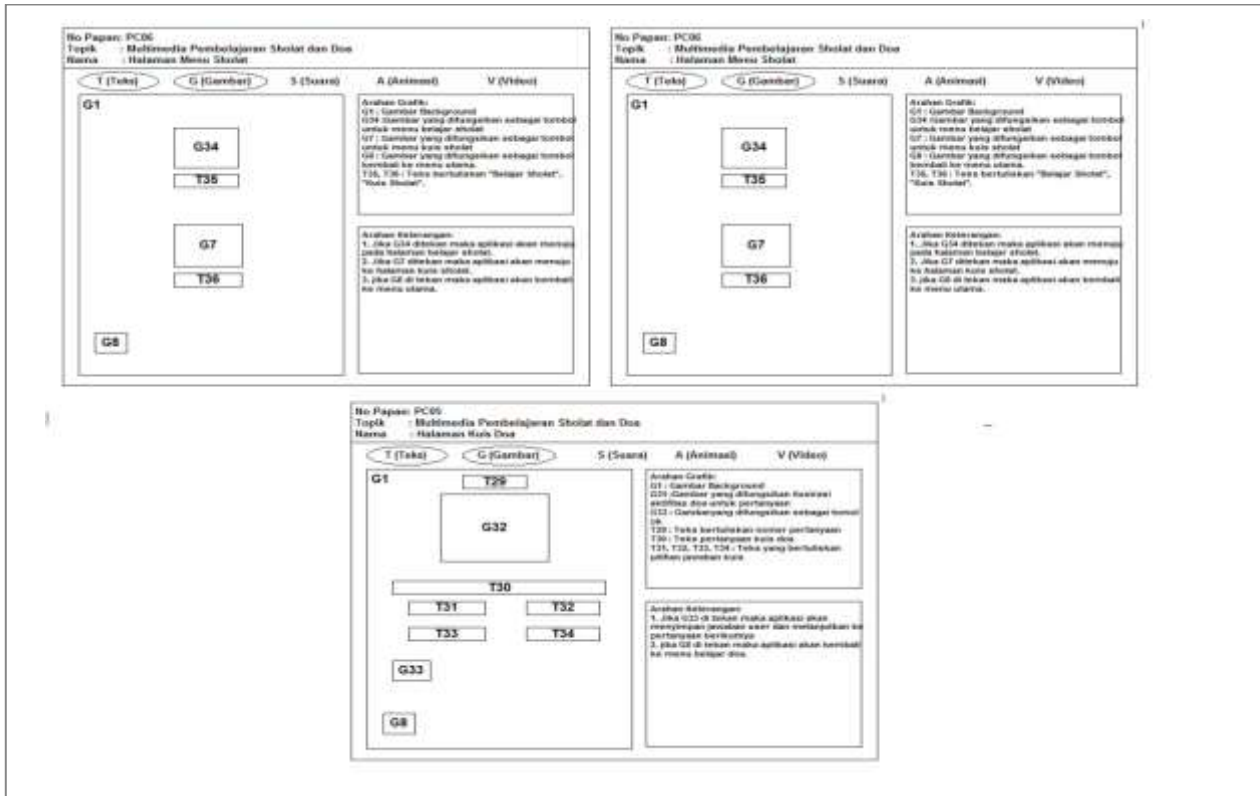


Figure 4: Storyboard of prayer menu

On the prayer guide menu there are three pages. Learn sholat, sholat details, and sholat quizzes. The storyboard of the sholat guide looks like in picture 5 below.

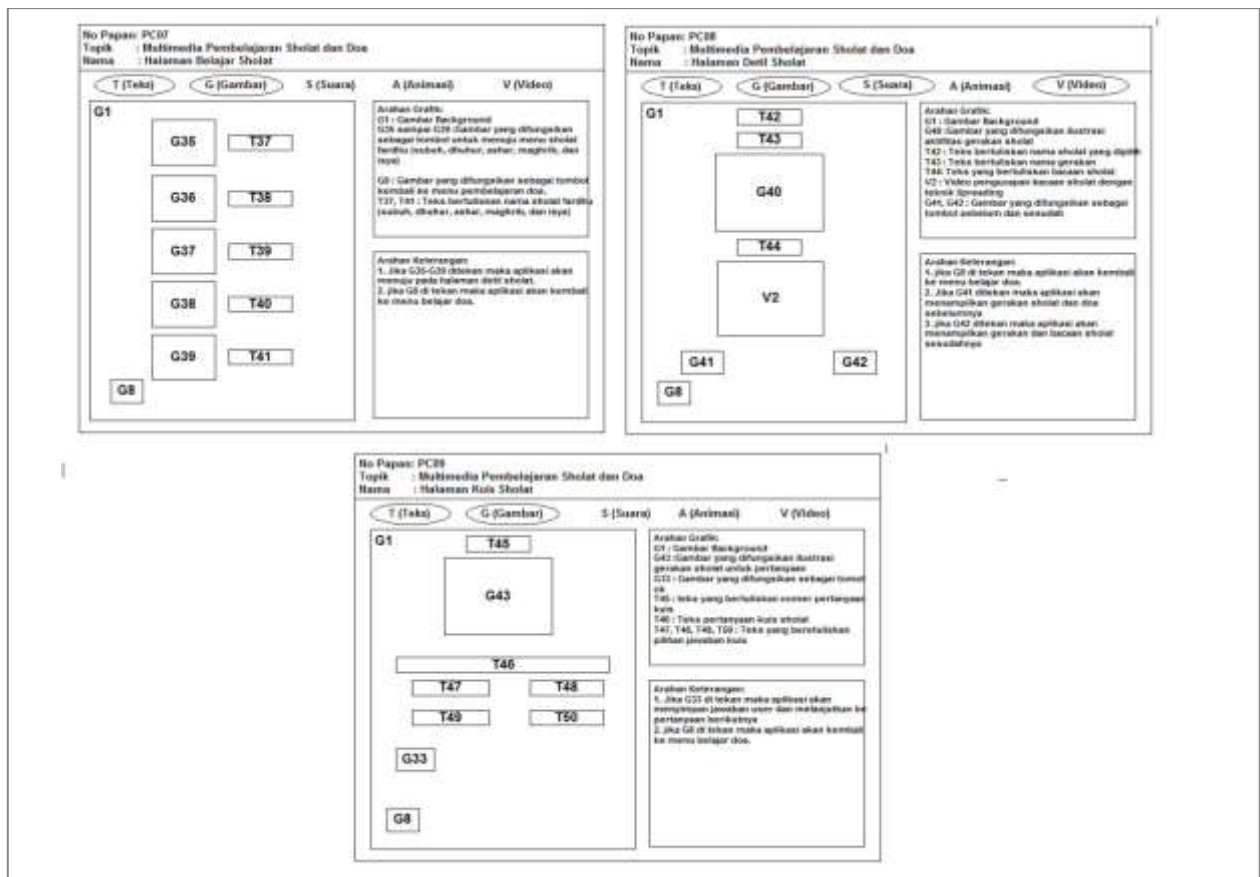


Figure 5: Storyboard of sholat menu

4.4. Prototype

The prototype design is the stage that aims to create a multimedia application prototype of the Muslim prayer guide for children with hearing loss (M-Sholuu). Design prototypes based on storyboard designs that have been made before. The prototype design of the multimedia mobile application of Muslim prayer guides for children with hearing impairment (M-Sholuu) is seen in the following picture 6.

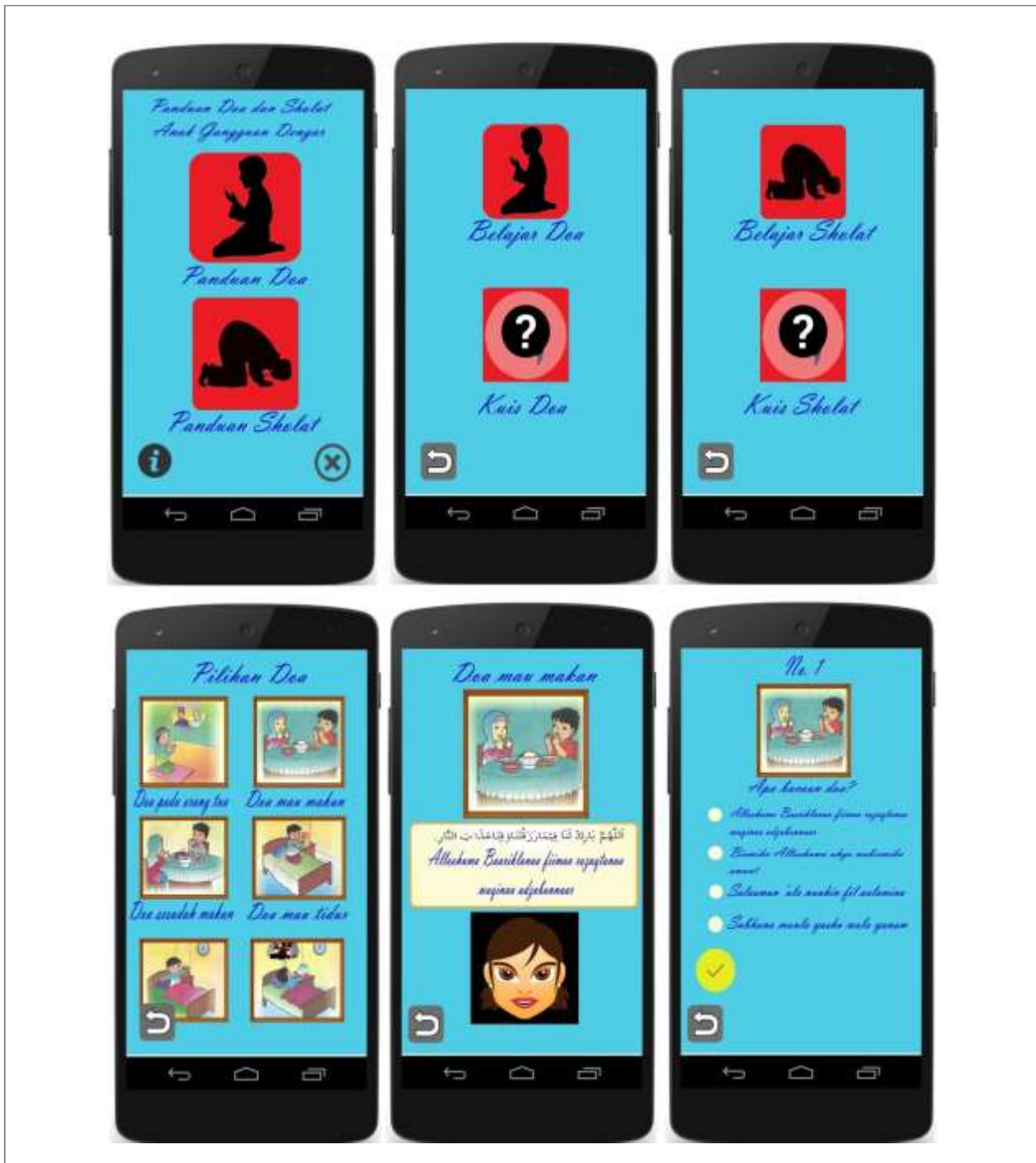


Figure 6: Prototype M-Sholuu

4.5 Prototype Evaluation

After the prototype is finished, the next step is to evaluate the prototype. This evaluation is done to find out and assess whether the prototype is in accordance with the needs of the user and the multimedia characteristics of the analysis. The prototype evaluation was carried out by multimedia experts and Karnnamanohara special school teachers. Seven questions that are indicators for evaluating prototypes are given to multimedia experts and Karnnamanohara special school teachers as respondents. The number of respondents in the prototype evaluation was 10 people consisting of 3 multimedia experts and 7 Karnnamanohara special school teachers. The results of the prototype evaluation are shown in the following table 2.

Table 2. The results of the prototype evaluation

Evaluasi Prototype						
No	Pertanyaan	STS	TS	R	S	SS
		1	2	3	4	5
1	The prototype has been described according to the purpose of the Muslim prayer guide application for children with hearing impairments				7	3
2	Guidance material on the prototype is in accordance with the needs of students				5	5
3	Components on the prototype have met the Muslim prayer guide requirements				6	4
4	The material in the prototype consists of learning methods and learning evaluation (quiz)				3	7
5	Muslim prayer material on the prototype includes five daily sholat				3	7
6	Prayer material on prototype includes daily activity prayers				3	7
7	The prototype has a special component for children with hearing loss in the form of speech with lip-reading				5	5
Total		0	0	0	32	38

The results of the prototype assessment on 10 respondents were: $(32 * 4 + 38 * 5) / (7 \times 10) = (128 + 190) / 70 = 4.42$. Thus, the prototype evaluation of multimedia experts and Karnnamanohara special school teachers scored 4.42 on a scale of 5.

4.6 Create Multimedia

The multimedia mobile application of Muslim prayer guides for children with hearing loss made with the android studio program. The M-sholuu application is created using three main parts: assets, layout, and java. The assets section is used to store the supporting files used in the application.. The following figure 7 is an example of an application display on the main menu. There are three views, the main menu page, the prayer guide page, and the sholat guide page.

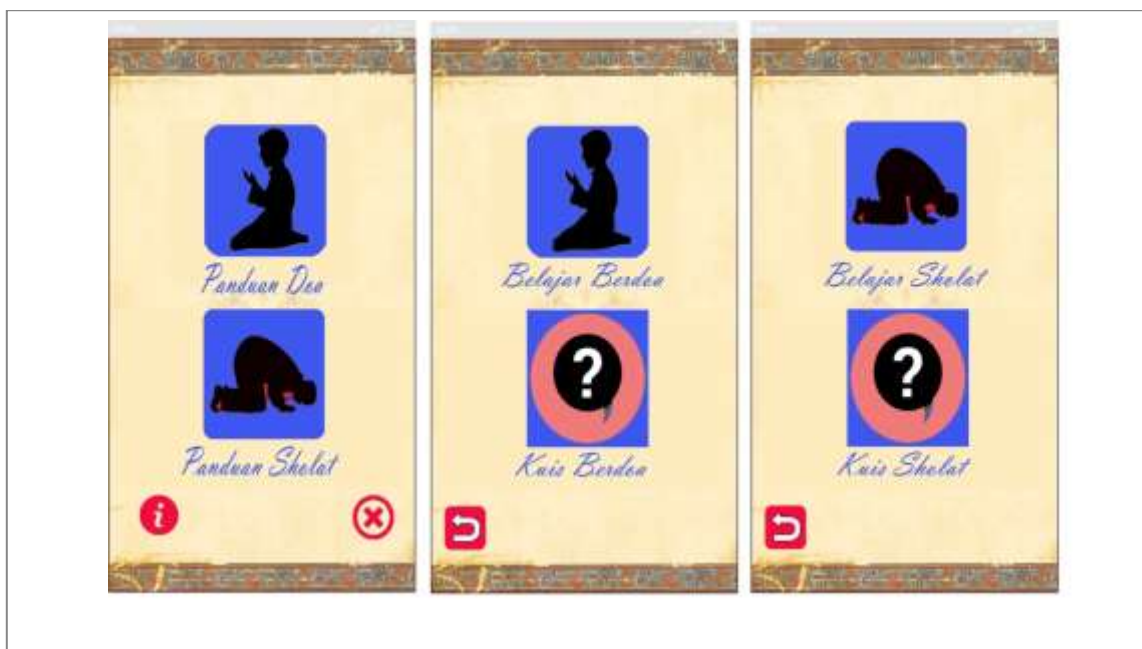


Figure 7: M-Sholuu Application

4.7 Multimedia Evaluation

After the completion of the mobile multimedia application, the next step is to evaluate multimedia. This evaluation was conducted to measure multimedia quality. The evaluation of the mobile multimedia application was carried out by 3 experts. Evaluations carried out by multimedia experts were conducted to measure multimedia quality with 17 questions as indicators. Assessment indicators are used scale scales on scale 5. The results of multimedia evaluations by experts are shown in the following table 3.

Table 3. The results of multimedia evaluations by experts

No	Indikator	Nilai
1	The learning objectives are clearly stated	3
2	Content meets learning objectives	4
3	Learning material is presented in sequence	4
4	Accurate and factual content	4,6
5	The scope of learning content is sufficient	4
6	Material depth	4
7	The relevance of the question of evaluation of competence	4,3
8	Content is easy to understand	4,3
9	User friendly display (easy to use)	4
10	Color choices according to user characteristics	4,3
11	Is there navigation	4,3
12	The existence of buttons is consistent	4,6
13	The text in the application is clear	4,6
14	The images in the application are clear and appropriate	4,3
15	The Sound on the application is clear	4,3
16	The animation in the application is clear and appropriate	4
17	The video in the application is clear and appropriate	4,3
Average		4,17

Table 3 shows that the results of multimedia quality evaluations carried out by experts on applications obtain a value of 4.17 from scale 5. In addition to being carried out by multimedia experts, this evaluation was also carried out by the teacher. There were 7 Karnnamanohara special school teachers who had evaluated the results as in Table 4 below.

Tabel 4. The results of multimedia evaluations by teachers

No	Indikator	Nilai
1	The learning objectives are clearly stated	3,14
2	Content meets learning objectives	4,14
3	Learning material is presented in sequence	4,14
4	Accurate and factual content	4,57
5	The scope of learning content is sufficient	4
6	Material depth	4,14
7	The relevance of the question of evaluation of competence	4,42
8	Content is easy to understand	4,42
9	User friendly display (easy to use)	4
10	Color choices according to user characteristics	4,42
11	Is there navigation	4,42
12	The existence of buttons is consistent	4,57
13	The text in the application is clear	4,57
14	The images in the application are clear and appropriate	4,42
15	The Sound on the application is clear	4,42
16	The animation in the application is clear and appropriate	4,14
17	The video in the application is clear and appropriate	4,42
Average		4,25

Data from table 4 shows that the results of multimedia quality evaluations conducted by Karnnamanohara special school teachers on applications have multimedia quality with a value of 4.25 from scale 5.

4.8 User Experience Evaluation

In addition to evaluating the application, evaluations were also conducted on the users of the application, the 2nd grade elementary school students in Karnnamanohara. This evaluation is carried out by parents by answering five questions as an indicator after observing children's behavior when using a mobile multimedia application prayer guide and prayer (M-Sholuu). The evaluation results are shown in table 5 below.

Tabel 5. The result of User experience evaluatuon

No	Indikator	Nilai
1	User reaction when running the application	4,4
2	The user shows the application to his friend	4,4
3	The user's face when running the application	4,2
4	After the user has finished using the application for the first time whether the user in the next few days is running the application again	4,8
5	When a user is asked to express his feelings using an emotional card, what emotional image is chosen	4,8
Average		4,52

The evaluation results presented in table 5 show that the positive behavior of users in using the multimedia mobile application for prayer guides and prayers is 4.52 on a scale of 5. In overall evaluation of the M-Sholuu application shows that the application has a very good value and can be accepted by the user. Applications can be used as a source of learning for children with hearing loss to make it easier to learn prayers and daily prayers.

5. CONCLUSSION

This research has succeeded in designing and creating a multimedia mobile application of Muslim prayer guides for children with hearing loss. The results of expert evaluations show that multimedia applications have met the needs of users with a value of 4.17 of scale 5. Likewise the results of multimedia evaluations carried out by teachers have obtained a value of 4.25 from a scale of 5. Evaluation of users who measure the level of satisfaction and attraction obtains a value 4.52 of scale 5. Overall this application has been in accordance with the needs of the user in learning prayer and prayer for children with hearing impairment in the elementary school class 2 of Karnnamanohara special school. The conclusion from the study is that children with hearing impairments have limitations in vocabulary and language so that prototypes are designed by minimizing unnecessary words and objects so as not to confuse users.

ACKNOWLEDGMENT

Thank you, the researcher conveyed to the Directorate of Research and Community Service, the Directorate General of Research and Development Strengthening, the Ministry of Research, Technology and Higher Education who had become a sponsor in this research.

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