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## DEVELOPING ANDROID-BASED LEARNING MEDIA IN ISLAMIC RELIGIOUS EDUCATION THROUGH THE MIT APP INVENTOR

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### **Abstract**

*Nowadays, almost all Islamic Religion Teachers and students have smartphones. However, these gadgets have not been utilized optimally in increasing students' learning motivation, mastery and understanding of Islamic Religion learning materials. One of the reasons why smartphones have not been developed in learning Islamic Religious Education is the lack of knowledge on how to develop android-based learning media. Based on the need assessment, it was important to do this development research. This study aims: (1) to produce product in the form of Android-based Islamic Religious Education learning media through the Massachusetts Institute of Technology (MIT) App Inventor or known as MIT App Inventor, and (2) to determine the feasibility of product in the form of android-based learning media through MIT App Inventor in Islamic Religious Education subject. The stages of development adapted Borg and Gall's models. The results of research and development showed: 1) the results of the validation by the experts found that the developed product was in the very good category; 2) the product of the learning media is in the feasible and good category to be used as the learning media for Islamic Religious Education.*

**Keywords:** *Learning Media Development, Islamic Religious Education, MIT App Inventor*

### **1. Introduction**

The position and function of the media is very important for increasing the effectiveness of learning. Moreover, the world is currently facing the corona 19 pandemic which has brought many changes to the world of education. Learning must be done online to protect students from the virus. Professional teachers are challenged to be creative in dealing with this situation. Some efforts to develop learning media based on IT are expected to increase the limitations of space and time and to increase the students' motivation, creativity and achievement. With the existing media, teachers

provide opportunities for students to rebuild the knowledge they have acquired. In fact, the class can be more active, there is a training process, the application of higher order thinking skills, so that the achievement of quality outcomes can be conditioned as described by Marzano, Pickering, & Tighe (1993).

Utilization of information technology in education is expected to create a pleasant atmosphere, learning is more communicative, interesting, so that learning objectives can be achieved effectively (S. Sirate & Yaumi, 2017; Tafonao, 2018). There is already a lot of software

classified as edutainment which is a combination of education and entertainment. One of the software that is currently popular in the community is Android, which is one of the operating systems embedded in smartphones (Saputra et al., 2020). The development of science and technology increasingly encourages renewal efforts in the use of technological results in the learning process. Teachers are required to be able to use the tools provided by the school and it is possible that these tools are in accordance with the developments and demands of the times. Teachers can at least use inexpensive and efficient tools even though they are simple and modest. It is a must in an effort to achieve the expected teaching goals. Besides being able to use the available tools, teachers are also required to be able to develop skills in making learning media that will be used when the media is not yet available. For this reason, teachers must have sufficient knowledge and understanding of learning media, which include: a) media as a communication tool to make the teaching and learning process more effective, b) the function of the media in order to achieve educational goals, c) the intricacies of the learning process, d) the relationship between teaching methods and educational media, e) the value or benefits of educational media in teaching, f) the selection and the use of educational media, g) various types of educational media tools and techniques, h) educational media in each subject, and i) innovation efforts in education (Hamalik, 1994).

Based on observations at SMA Negeri Patikraja, most of the students of class X already have their own cell phones and the majority use Android smartphones. However, its use is still limited, especially in integrative learning of Islamic Religious Education. The emphasis of Islamic Religious Education (PAI) is on developing the nature of the students' diversity so that they are able to understand, appreciate,

and practice Islamic teachings better. To achieve this, media is urgently needed, especially now that teaching learning is not conducted offline, avoiding face-to-face by online learning. Therefore, the presence of learning media, including smartphones, becomes an easy alternative for students and teachers. In addition, based on the data of need assessment for teachers and students, it is obtained that teachers and students needed more interesting and varied learning media for Islamic Religious Education based on Android.

Based on the results of previous studies, it was found that the development of android-based learning media has been widely carried out. However, those related to the development of Islamic learning media using the MIT App Inventor do not exist yet. Massachusetts Institute of Technology (MIT) App Inventor abbreviated MIT App Inventor is an innovative application developed by Google. In addition, MIT introduces and develops android programming by transforming complex text-based programming languages into visual-based (drag and drop) blocks (Siregar, nd). Through Android-based media, the function of educational media to channel messages from sender to receiver can be improved in stimulating students' thoughts, feelings, concerns and interests and attention so that it can improve the learning processes and outcomes (Rohani, 1997).

There are at least four foundations that can be used why media is needed in the learning process, namely: the basis of the media as a learning system, the basis of the media as a form of communication, the psychological basis of the use of media, and the philosophical basis of the use of media (Hasan et al., 2021, pp. 59 -60). However, in its use, it is necessary to pay attention to the effectiveness of media, for example by considering cost, compatibility with

class size, conciseness, ability to change, time and effort to prepare, impact, complexity and finally its usability.

Through android media, these limitations can be overcome through App Inventor. App Inventor is an open source web application originally developed by Google, and currently maintained by the Massachusetts Institute of Technology (MIT). App Inventor allows new users to program computers to create software applications for the Android operating system. App Inventor uses a graphical interface, similar to the user interface on Scratch and StarLogo TNG, which allows users to drag and drop visual objects to create applications that can run on android devices.

## 2. Method

This research is a type of Research and Development (R&D), namely the research method used to produce the product of the Islamic Religious Education learning development model (Borg, WR & Gall, 1983). The research procedure was simplified into six stages, adjusting to the needs and limited research space (Sugiyono, 2009). The six stages used in this study are: 1) analysis and potential problems, 2) data collection, 3) product design, 4) design validation, 5) design revision, and 6) product testing. Furthermore, the product was validated by 3 experts, namely: material/content expert for Ibadah (Worship) subjects, 2) learning media design expert, 3) teaching experts/lecturers/teachers. This validation includes material/content validation and product design/media validation. This validation aims to obtain data in the form of assessments and suggestions from the validator, so that it is known whether or not the product developed is good and then used as a basis for making revisions.

The validation subjects consisted of 3 experts,

namely the lecturer of Islamic Religious Education (PAI) at Universitas Muhammadiyah Purwokerto as material/content expert or media expert, and a PAI teacher at SMA Negeri Patikraja as a teacher who tested the feasibility of the product. The validators in the subject matter/content of Islamic Religious Education, should have these following criteria: 1) being a PAI lecturer who is competent in fiqh, 2) having a minimum educational background of S2, 3) mastering the curriculum for Fiqh/ Worship subjects at SMA/MA. Meanwhile, for Learning media design expert, they should have the following criteria: 1) having a minimum educational background of S1 Computer, 2) having experience in the field of web development and mobile development. For Expert lecturers/teachers of Islamic Religious Education subjects, he/she should have the following criteria: 1) teachers of Worship subjects at the SMA/MA level, 2) having an undergraduate background in Islamic Religious Education, 3) understanding the curriculum for Worship subjects at the SMA/MA level, 4) having minimum 5 years teaching experience.

The research instrument used in this development research is a questionnaire. Questionnaire is a data collection technique done by giving written questions to respondents. There are two types of questionnaires: closed and open questionnaires. This study used a closed questionnaire to obtain data on the quality assessment of the feasibility of learning media. The data collection instrument in this study was carried out by three validators namely, material expert, media expert and teaching expert.

The data are analyzed using descriptive analysis technique, namely changing the category value into an assessment score. In this case the researcher uses a Likert Scale, namely the assessment in the form of categories and then converted into an assessment score. Conversion of

category values into assessment scores, from a range of 1-5. Analyzing the score is done by calculating the score that has been obtained from the study and then dividing it by the ideal score for all items then multiplying it by 100%. The formula can be stated in the following formula (Sugiyono, 2009, p. 137)

$$V = \frac{Se}{Sh} \times 100\%$$

Note: V = Validity  
Sh = Total Ideal Score  
Se = Total Empirical Score  
(Expert Test Results)

Table 3.1. Feasibility Criteria for Media Quality

Percentage of Assessment (%)	Category	Description
80.1-100	Very Good	Very Feasible
60.1-80	Good	Feasible
40.1-60	Fairly Good	Fairly Feasible
20.1-40	Poor	Unfeasible
0-20	Very Poor	Very Unfeasible

If the expert validation score is obtained at least 60.1% (good), then the media, the developed learning, can already be used as a medium of learning in school activities

### 3. Result and Discussion

At the stage need assessment, potential and problem analysis was carried out. Researchers have conducted interviews with Islamic Religious Education teachers at SMA N Patikraja. Based on the results of researchers' interviews with Islamic Religious Education teachers at SMA N Patikraja, it was found that out that of ten classes (320 students) at SMA N Patikraja, on average, only 10 students of class X did not have smartphones. In the process of teaching and learning activities, teachers still use module and worksheets so that the students were less enthusiastic in participating in the learning. Hence, learning

media needed to be developed so that along with technological developments, students are more interested in participating in the learning process.

Based on the need analysis above, the researcher discussed with the teacher to develop an Android-based Islamic Religious Learning media. At this stage, the researcher gained some information from journals, Islamic Religious Education books for SMA/MA, the internet and syllabus. In addition, researchers collected some important information and then developed it to solve problems and to take action in the next step.

The design stage is the step of making product designs. The product design was realized in the form of drawings or flowcharts before the development stage was carried out. The product design of this research consisted of four parts, namely: Cover, KI and KD, Material, and Quiz. For more details, the design of Islamic Religious Education learning media only took the Hajj Chapter. Stages of product design began with the creation of flowchart media design. This flowchart was used to facilitate and serve as a guide in making learning media. The following is a flowchart of the development of learning media in the Hajj Chapter.

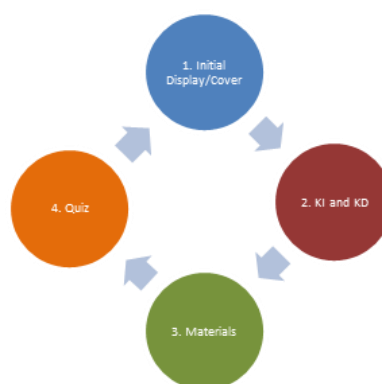


Figure 1. Flowchart of Media Product

The followings are the explanations of the figure above:

- 1) initial display/cover is the initial display of the application which contains an image on the start page of the application and buttons to enter the next page,
- 2) KI and KD contains exposure to core competencies and basic competencies taken from the syllabus,
- 3) materials contain materials regarding the hajj chapter such as the meaning of hajj, law of hajj, terms and pillars of hajj, types of hajj, and the virtues of hajj, and
- 4) quiz contains multiple-choice questions. totaling 10 as an evaluation tool for students' learning and scores obtained when completing the questions.

The flowchart is used as a guide in creating media. In making this application, in addition to using MIT App Inventor, researchers also use supplementary applications such as Corel Draw (creating/editing images for page backgrounds) and SublimeText (creating html text containing material for the Hajj chapter). Inside the MIT App Inventor, there are two main menus, namely the designer menu and the block menu.

The first thing to do was creating a display design on the MIT App Inventor which consists of 5 pages, namely the cover page, KI and KD pages, material pages, quiz pages and scores pages. After completing the page design, then buttons were created on each page used as navigation in the application. After the page design had been completed, then the material text (the Hajj chapter) was created into the html format using the SublimeText application. Next, coding (the programming language on the MIT App Inventor in the form of blocks) was created in the MIT App Inventor (located in the block menu) so that the buttons that had been created on the design menu can run according to their use. And then, quizzes were created in the form of multiple choices totaling 10. Each question has

10 points for each correct answer. After designing the learning media application, then a trial/test was carried out on several types of smartphones. This trial was done to find out whether the application can run smoothly or not. The process of designing this application took approximately 2 months.

The following is the display of the process in developing the MIT App Inventor learning media for Islamic Religious Education.

### 1. Initial Display of MIT App Inventor



Figure 2. Initial Display of Learning Media MIT App Inventor

### 2. Display Design of Menu

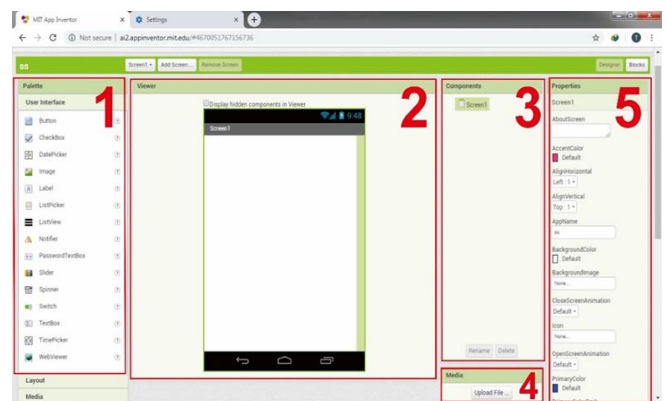


Figure 3. Display Design of Menu

After the learning media had been created then it was validated. This product was validated by Drs. Wage, M.Ag. as the material expert and Rifdhotul Alfiansyah S.Kom as the media expert. The following are the results of the validation

assessment from the expert. The assessment conducted by Drs. Wage, M.Ag consisted of 14 assessment indicators, namely: (1) clarity of core competencies, (2) clarity of basic competencies, (3) feasibility of learning material with KI & KD, (4) feasibility of material with syllabus, (5) clear delivery of material, (6) the interesting material, delivery (7) the suitability of the image/illustration, (8) the suitability of the level of difficulty of the material, (9) the attractiveness of the material, (10) the depth of the material, (11) the completeness of the material, (12) interesting evaluation/quiz material, (13) evaluation/quiz to help students understand the material. The percentage of material expert assessment results 87.7% in the "very good" category

Table 1. Validation Assessment Results by Material Expert

No	Aspects of Assessment	Number of Indicator Items	Score Obtained	Ideal Score	Level of Feasibility
1	Material	13	57	65	87.7%

Meanwhile, the assessment carried out by Rifdhotul Alfiansyah S.Kom consisted of media aspects and usage aspects. The media aspect consists of 10 indicators, namely: (1) suitability of cover/start page, (2) page design, (3) readability of text, (4) accuracy of design layout, (5) color combination, (6) button placement, (7) button size accuracy (8) button description, (9) image clarity, (10) image color contrast quality. The percentage obtained from this aspect is 80% in the "very good" category. while the aspect of usage consists of 3 aspects namely; (1) the ease of using the media, (2) the suitability of the image with the material, (3) the suitability of the button with its function. The percentage obtained from this aspect is 93.3%. The average of these two aspects was 86.65% in the "very good" category.

Table 2. Validation Assessment Results by Media Expert

No	Aspects of Assessment	Number of Indicator Items	Score Obtained	Ideal Score	Level of Feasibility
1	Media	10	40	50	80%
2	Usage	3	14	15	93.3%
Average number of percentages				86.65%	

Based on the validation assessment carried out by material expert and media expert, it was found some weaknesses or limitations of the initial product. According to the media expert, it was suggested that the location of the button on the start page should be adjusted, audio to the displayed paragraph should be added, and the html text should be displayed. The validation carried out by the material expert and the media expert was only carried out once because according to the two experts, the product had been quite good and deserved to be tested with some revisions. The following is the result of the revision from the media expert:

Table 3. Media Expert Revisions

No	Suggestions for Improvements	Improvements made
1	The location of the buttons on the start page	Adjusting to the button layout and spacing on the start page
2	Adding audio to the displayed verse	Adding audio of Surat Ali -Imran verse 97
3	Displaying the html text to make it neat.	Adding text box to the html text display.

In this stage, a product feasibility test was carried out by the Islamic Religious Education teacher at SMA N Patikraja and tested on students of class X IPS one SMA N Patikraja. The assessment was carried out by Aflahah Taufik S.HI consisting of material aspects and media aspects. Material aspects consist of 5 indicators namely; (1) the suitability of KI and KD, (2) the suitability of the level of difficulty of the material, (3) the good presentation of the materials on the media, (4) the suitability of the media with the material, (5) the

suitability of the level of difficulty of the questions. Islamic Religious Education (hajj chapter); (3) find The score obtained in this aspect is 88% in the "very out the effectiveness of android-based learning good" category. Meanwhile, the media aspect media through the MIT App Inventor (hajj chapter) consists of 5 indicators, namely; (1) the display of seen from the process. The development stages the contents of the application, (2) the quality of the carried out are (1) potential and problem analysis text/images, (3) the legibility of the text/images, (needs assessment), (2) data collection, (3) product (4) the suitability of the audio with the paragraphs design, (4) product validation, (5) product revision, displayed, (5) the ease of the media usage. The and (6) product testing. The following is an score obtained in this aspect is 84% in the "very explanation of the six stages of development. good" category. The average of these two aspects is 86% in the "very good" category.

Table 4. Assessment Results of Teacher Expert /Teacher Validation

No	Aspects of Assessment	Number of Indicator Items	Scores Obtained	Ideal Score	Level of Feasibility
1	Material	5	22	25	88%
2	Media	5	21	25	84%
Average number of percentages					86%

Tests conducted on students through observation on the students' attitudes in the learning process, namely before using and after using learning media. In observing the learning process of Islamic Religious Education, the researcher was assisted by the teacher during the learning process. According to the observations of the Islamic Religious Education teacher after the media trial, he said "with this android-based learning media, students' attention is increasing in learning activities, and this media can be an alternative for me when selecting the learning media so that students do not get bored in participating in teaching learning activities".

This research is Research and Development which aims to: (1) produce a product in the form of android-based learning media through the MIT App Inventor on Islamic Religious Education subjects (Hajj chapter); (2) determine the feasibility of the product in the form of android-based learning media suggestions for initial product revisions. At this through the MIT App Inventor in the subject of stage, the product was validated by material expert

In the first stage, the stage of the analysis of potential and problems, there were two things analyzed, namely the existing potential and the problems that occurred. From the results of the interviews, it was found that the students are allowed to bring cellphones in the school and most of them were android users. Meanwhile, the problem that occurred was that teachers still rarely used learning media during the learning. They only used modules and worksheets so that students were less active and interested in the learning process. From the results of observing the potential problems and needs above, the researcher concluded that there was a need to develop Islamic Religious Education learning media so that learning media could be more varied along with technological developments to make students more interested in following the learning process.

In the second stage, in the stage of data collection, information was obtained from journals, Islamic Religious Education books for SMA/MA, the internet and syllabus. The third stage of product design is divided into 5 parts, namely making flowcharts as a product design guide, making application display designs, making backgrounds, making html texts, and setting blocks/coding.

The fourth stage, product validation, was carried out to determine the level of feasibility and



and media expert. The score of the presentation by material expert was 87.7% in the "very good" category and the average percentage by the media expert was 86.65% in the "very good" category. The fifth stage of product revision was carried out based on validation assessments by material expert and media expert. This can be seen the limitations of the initial product so that some improvements can be made according to suggestions from the media expert.

In the sixth stage of product testing, a product feasibility test was carried out by Islamic Religious Education teachers at SMA N Patikraja and tested on students of class X IPS 1 SMA N Patikraja. From the results of the feasibility test, the Islamic Religious Education teacher got a percentage of 86% which was included in the very good category. While the results of the trial to students, from observing students' attitudes during learning, it was found that students became more active and interested in participating in teaching and learning activities. Therefore, it can be said that this media is effective to be used during learning process. It was seen that the students became more active in participating in learning activities with the right teaching method used. by the teacher. Thus, this application is feasible to be used as the learning media.

Media quality assessment is an assessment through validation from three experts, namely, the material expert, the media expert and the teaching expert / teachers of Islamic religious education subjects. The results of the validation assessment can be seen in the following table:

Table 5. Validation Assessment Results  
by Three Experts

No.	Media Quality Assessment	Percentage	Assessment Category
1	Material Expert Validation	87.7%	Very Good
2	Media Expert Validation	86.65%	Very Good
3	Teacher Expert Validation	86%	Very Good

Average Percentage	86.7%	Very Good
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Based on the table above. it can be seen that material expert validation obtained 87.7% in the "very good" category, media expert validation obtained 86.65% in the "very good" category, teacher expert validation obtained 86.0% in the "very good" category. good". From the results of the validation by the three experts, it obtained an average percentage of 86.7% which was included in the "very good" category and the learning media produced in this study were feasible to be used as learning media for teachers. While the level of effectiveness in this study is seen from two points, namely, from the feasibility of the media that had been validated by three experts and from the observation of the learning process when testing the learning media. From the feasibility level of the media, it is categorized as very good and feasible to be used as learning media. Meanwhile from the results of the observation of students' attitudes during learning, it was seen that the students became more active and interested in participating in teaching and learning activities. So, the effectiveness of this media can be seen during the learning process. Students became more active in participating in learning activities supported by the teaching method used by the teacher.

Research on the development of android-based learning media for Islamic religious education subjects through the MIT App Inventor in its development still have limitations, including: first, the content of the material in the learning media which is still focused on the Hajj material, secondly, it has not yet reached the stage of field testing and wider.



## CONCLUSION

Based on the results of the study, it can be concluded that: first, this study produces learning media for Islamic Religious Education for class X (Hajj chapter) in the form extensions of application apk and barcodes (another alternative for application installation) which is packaged in the form of a CD (compact disc). Second, after going through the validation stages by three experts, the application of Islamic Religious Education learning media (Hajj chapter) is feasible to be used as learning media. Based on the results of the material expert validation, it obtained 87.7% in the "very good" category. Based on the media expert validation, it obtained 86.65% in the "very good" category. Based on the teacher expert validation, it obtained 86.0% in the "very good" category. Therefore, from the results of the validation of the three experts, it obtained an average percentage of 86.7% that was included in the "very good" category or feasible for use as learning media. Third, based on the observation during the learning process using this media, it can be concluded that this media can provide motivation and activeness in learning.

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