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Development of Augmented Reality-based Learning Media to Improve Students' Understanding of Moral Affairs Lessons in Class IX MTs

Uswatun Hasanah, Asri Widiatsih[2], Eges Tri Wahyuni[3]
[1,2,3] PGRI Argopuro University Jember, Indonesia

E-mail: [1] uswatunhasanah@gmail.com
*, [2]asriwidiatsih@mail.unipar.ac.id, [3]eges.triwahyuni@gmail.com

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ABSTRACT
The product developed in this media is an Augmented Reality-based learning medium that is an application. Basically, Augmented Reality media is a software to create 3D image, video, text and audio devices into a program created.The study aims to determine the effectiveness and level of students' understanding of the material of faith to the last days using the Augmented Reality media. Research and development techniques, or simply "research and development," are employed in this kind of study. The development product validated by the media expert receives a 79% rating with a valid category, while the media validation receives a 97.5% rating with the highly valid category used. Samples from class IX students are then used, using one group pretest and posttest design patterns. Dick and Carey's nine-stage development design model is used. The daily repeat values before and after the therapy were the data, which were then subjected to t test analysis. The study's findings demonstrated the high degree of efficacy and comprehension of the augmented reality-based learning resources employed, particularly in the academic areas.

Keywords: media development, augmented reality, student understanding

INTRODUCTION

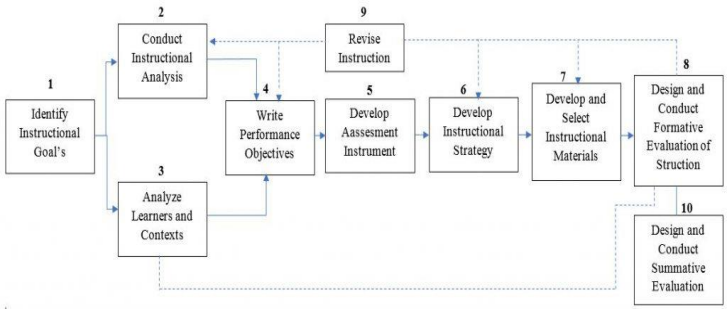
The use of information and communication technology in the learning process of teaching students today requires further exploration. This exploration aims to contribute to a better understanding of the child's learning process. The use of information technology is one way for children to easily understand what they are learning, such as using augmented reality learning media. (AR).

According to recent technological advancements, teachers can use these tools—

augmented reality, for example—to communicate concepts that are challenging to teach in the classroom (Utami, 2021). According to Suryawinata (2010), cited by Yimaz (2016) in the journal UTMI (2021), augmented reality technology is a combination of the virtual and real worlds produced by computers. It is defined as the fusion of the real and virtual worlds, allowing for interaction and the presentation of three-dimensional objects (3D).While much study has been done on the creation of Augmented Reality (AR) learning materials, there hasn't been much work done on Akidah Akhlak learning materials for ninth-grade math teachers.

METHODS

The study was designed using a learning development model (Walter Dick and Carey, 1978) in a research thesis.(Ibrahim, 2016). In this model, there are 10 stages of learning design, but in this study, the researchers used only 9 stages. This is because of the consideration that the development of Augmented Reality-based learning media is limited to testing a product prototype. The tenth stage is the summary evaluation that the researchers do not do because they are outside the learning system. Here is a picture of learning development model (Walter Dick and Carey, 1978) quoted in a research thesis (Ibrahim, 2016).



1.Desig

Based on the Walter Dick and Lou Carey learning design system approach model as mentioned above, the development procedure in this development research follows the steps instructed in the design model as follows (Fitratul Uyun, 2010) in research (Ibrahim, 2016):

1. Identifying Instructional Goal (Identifying general learning objectives)
2. Conducting Instructional analysis

3. Identifying Entry Behaviors, Characteristics (Identifying entry behaviors and student characteristics) 4. Writing Performance Objectives (formulating specific learning objectives)

5.Developing Criterion - References Test (Developing benchmark reference test items)

6. Developing Instructional Strategy.

7. Developing and Selecting Instruction (selecting and developing learning materials).

8. Designing and Conducting Formative Evaluation.

9. Revising Instruction

At the stage of developing Augmented Reality-based learning media, there are several stages that must be done in the research, namely

1. Initial situation analysis stage a) Curriculum review, b) A review of the theory of students' level of understanding, c) Study of Augmented Reality-based learning media

2. Augmented Reality (AR)-based learning media design development stage The activities carried out at this stage are as follows: a) Determination of basic competencies that must be achieved by students b) Determination of time allocation c) Learning content development d) Augmented Reality-based learning media content development e) Development of learning activities

3. The stage of making mediaAugmented Reality The steps in making Augmented Reality media include several stages, namely:

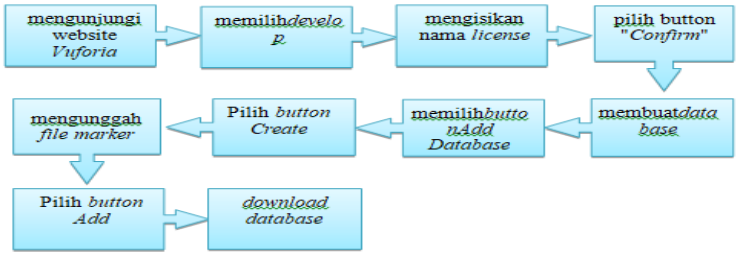
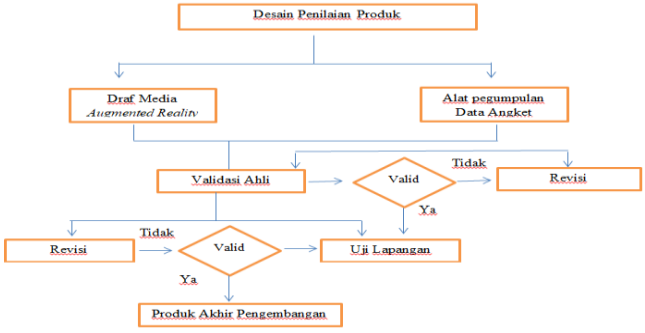


Chart 1. Augmented Reality media creation stage

1. Design Product trial



2. Validation stage

a. Teacher validator: IT lecturer, and has taken the S-2 level in the Information and Computer Technology study program b. Aqidah Akhlak teacher: Aqidah Akhlak teacher of class IX who has experience teaching Aqidah Akhlak, and the last education is S-2 Islamic Religious Education program.

3. Large group field trial stage

The sample that will be a large group pilot test is class IX students of MTs Hidayatul Munawwarah. The data obtained was then analyzed. The data analysis technique in this study is to describe all opinions, suggestions and validator responses obtained from the criticism and suggestion sheet. Data from the questionnaire is qualitative data quantified using a Likert scale (Sugiyono, 2010). (Sugiyono, 2010) which has a four-level criteria, then analyzed through the calculation of the percentage of item scores on each answer to each question in the questionnaire.

a. Product Validation Analysis

$$Persentase = \frac{\sum skor\ yang\ diberikan\ validator}{\sum skor\ maksimal}\ x\ 100\%$$

Mencari persentase hasil keseluruhan skor yang diperoleh menggunakan rumus:

$$Persentase = \frac{\sum keseluruhan\ skor\ yang\ diberikan\ validator}{\sum (skor\ maksimal\ angket)(banyak\ validator)}\ x\ 100\%$$

Tabel 5 PengambilanKeputusanRevisiProduk

Kategori	Penilaian(%)
SangatValid	80<*N*≤100
Valid	60<*N*≤80
CukupValid	40<*N*≤60
TidakValid	20<*N*≤40
SangatTidakValid	0 <*N*≤20

b. Trial Data Analysis

Analysis is needed to determine the achievement of the learning objectives that have been set. Product trial data is collected using tests. Tests are used to determine the level of understanding of students, trials before and after using Augmented Reality learning media. Furthermore, the data will be analyzed using IBM SPSS 26, namely the t-one group test (pretest and postest).

RESULTS AND DISCUSSION

In this section IV will be described about how the process and results of the development of Augmented Reality learning media to improve the understanding of MTs class IX students. The process of developing Augmented Reality media is carried out

validity test, reliability test and effectiveness test of Augmented reality media developed. This researcher refers to the Dick and Carey development model approach to nine stages of the ten stages as follows:

1. Identifying Instructional Goals The identification of learning objectives is by analyzing the curriculum such as the syllabus of aqidah akhlak subject matter of faith in the last day with the core competencies to be developed, namely when following the process of teaching and learning activities students can use Augmented Reality learning media so that students more easily understand the contents of the material of faith in the last day.

2. Conducting Instructional analysis Where the analysis carried out on students includes several things, as follows: a. Learning process analysis b. Student analysis c. Analysis and learning objectives

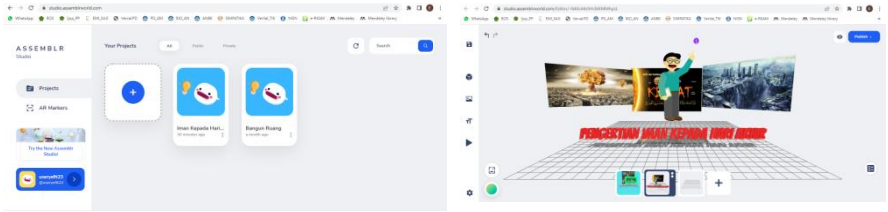
3. Identifying student characteristics In this case the researcher makes direct observations of students and conducts direct interviews with the relevant teachers regarding the characteristics of students at MTs Hidayatul Munawwarah, especially class IX.

4. Formulating Specific Learning Objectives (Writing Performance Objectives) The specific objectives in learning aqidah morals on the material of faith in the last day are as follows: a. Students can understand and explain about faith in the Last Day. b. Students can mention the signs of the Last Day c. Students can mention other names of the last day

5. Creating Test Items using Criterion Referencea. Trial Data Analysis: To ascertain if the established learning objectives have been met, analysis is required. Data from product trials is gathered through testing. Students' comprehension levels are assessed by tests that are administered both before and after they use augmented reality learning resources. Additionally, IBM SPSS 26, specifically the t-one group test (pretest and posttest), will be used to examine the data.

The benchmark reference test items or assessment instruments are in the form of questions that researchers ask directly to students when students before and after using Augmented Reality media that penelity developed. The benchmark reference tests are: a. Pretest is before using the developed product b. Posttest is after using the developed product

6. Developing Instructional Strategies At the stage of developing learning strategies, researchers determine the strategy used is a learning model that can make students active and fun when participating in learning. 7. Developing and Selecting Instructional Materials The description of the content of this learning media product is as follows: a. Augmented reality-based learning media products are specialized in Aqidah akhlak subjects for ninth grade students of MTs Hidayatul munawwarah. b. Systematically organized which aims to explore the level of knowledge or cognitive of students with the help of Augmented reality media. c. Contains a series of learning materials that have been clearly formulated in accordance with KI and KD curriculum 13. d. Researchers compiled some material related to faith in the last day to make it easier for students to learn independently and operate directly with the help of Augmented reality media with assemblr edu application. e. Create Augmented reality objects that can visualize the modeling of the final day. f. There is an animated video for simulation in the learning meter of the last day.



Augmented reality learning media display on the material of faith in the last day 8. Designing and Conducting Formative Evaluation This data analysis is done after obtaining data from the evaluation sheet of learning media for media experts (S2 lecturers / IT lecturers) and material experts (Aqidah akhlak / S2 teachers). The results of the analysis will be used to improve the Augmented Reality media developed. a. Media expert product validation b. Material expert product validation 9. Revising the Product (Refising Instruction) The data used as the basis for revision is based on suggestions and input from media expert validators and material expert validators. The revision of the media expert is in writing Augmented Reality should not be abbreviated as AR so that there is clarity for users of Augmented Reality media, while the revision of the material expert is that it must attach a learning device as a landsaan in conducting teaching activities and attaching pretest-posttest questions as a test to determine the level of understanding of students in aqidah akhlak lessons.

To ascertain the degree of variation in the mean score attained by pupils between the pre-test and the post-test periods (protest). In this study, students' comprehension of the subject of aqidah akhlak class IX MTs Hidayatul munawwarah is improved by the usage of Augmented Reality learning medium. Exam results from both before and after utilizing augmented reality media were utilized by researchers to gauge students' comprehension levels. Daily test results prior to receiving treatment (pretest) are derived from written assessments administered by the mapel teacher, and daily test results subsequent to treatment (posttest) are derived from the outcomes of written assessments that have been.

The 35 responders, or students, all have pretest and posttest results, according to the one sample statistics and one sample test tables. The average student pretest score is 53.00, the average student posttest score is 81.71, with the lowest student pretest score being 35 and the highest being 70, and the lowest student posttest score being 75 and the highest being 90. Deviation freedom 34 sig.2 tailed value of 0.00 with a 95% confidence degree. These findings indicate a 28.71% rise in student scores. a. Evaluation of the progress of augmented reality media It is evident from the end output of augmented reality media development that the qualities of instructional media utilized during the procedure.This educational resource integrates text, pictures, sound, and video to provide content about faith in the last day. When looking at the manufacturing process, augmented reality media using Android is thought to be practical to use as a learning medium. It also doesn't require a long development time because it isn't too complicated for novices. We must be more inventive because of its shortcomings, which include the fact that not all Android devices can download augmented reality apps and that there are issues with signal collecting when launching these apps.

c. Evaluation of Augmented Reality media's efficacy According to the trial data collected on class IX MT students, the student pretest had a high score of 70 and a low score of 53. The posttest had a maximum score of 90 and a lowest score of 75. According to the test results, using augmented reality media in class IX aqidah akhlak courses is thought to be beneficial in terms of increasing student comprehension.

d. An examination of students' comprehension of augmented reality media The existence of augmented reality instructional media is clearly indicated by the findings of

field tests, expert and practitioner research, and other sources. This evaluation shows the viability of the outcomes of the creation of augmented reality instructional materials that instructors employ in aqidah akhlak classes. Teachers and students can use augmented reality-based teaching materials because their development has been validated by media and content specialists.

e.The percentage of the level of attainment of the compatibility of the content with teaching media taken from the results of material validation is 97.5%, according to research conducted by moral aqidah topic specialists on augmented reality-based teaching media. This demonstrates that teaching materials based on augmented reality can be used to impart moral aqidah on the subject of faith in the last day.

CONCLUSIONS

1. The product developed in this study is Augmented Reality learning media on the subject of aqidah akhlak material of faith in the day of class IX MTs even semester. This Augmented reality-based teaching media is an android application in the form of Augmented reality which has an Apk file format. This Apk file can be installed on a mobile device with Android OS and then run according to its use as a learning medium.
2. The average pretest scores, which indicate students' starting proficiency in the topic of aqidah akhlak, are 53.00. Student scores climbed to 81.71, up 28.71%, after engaging in teaching and learning activities using interactive learning models based on augmented reality media. This demonstrates the successful application of media in teaching aqidah akhlak subject of faith on the final day of class IX MTs.
3. Augmented reality-based interactive learning is very helpful in enhancing students' comprehension of a subject matter comprehensively, which is better than conventional learning, according to the indicator of learning completeness.

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