

STUDY OF THE EFFECT OF USING AUGMENTED REALITY (AR) BASED LEARNING MEDIA IN ISLAMIC SUBJECTS AS AN EFFORT TO IMPROVE STUDENTS' COGNITIVE LEARNING OUTCOMES

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Abstract: *The process of implementing Islamic education generally uses the method of reading textbooks and practical methods, but this is not optimal. Therefore innovation is needed to develop interesting and interactive learning media. Learning media with Augmented Reality (AR) technology can provide opportunities for students directly to get more detailed information. Augmented Reality (AR) technology is a technology that can be used as a learning medium by combining two or three-dimensional visual objects that can be presented in the real world and displayed in real-time. This technology can be used in practicum-based Islamic education in the subject of knowing hijaiyah letters, performing ablutions, performing prayers, procedures for washing the cadaver, and so on. The use of Augmented Reality (AR) technology as a learning medium can improve student learning outcomes in the cognitive domain which includes students' ability to name, give examples, memorize, understand, distinguish, and determine. This study uses a qualitative approach through the research method of a literature study to support Islamic Education activities with the background of the need for learning innovations following the digital age.*

Keywords: *Learning Media, Augmented Reality (AR), Islamic Education*

Introduction

Learning is the most important part of human life. Where with the existence of learning humans can change their conditions from those who did not know to know, from those who did not understand to understand, and from those who could not to be able and have an impact on the welfare of human life. As stated by Setyosari and Sul-ton who said that learning is an effort made by students (teachers, instructors) to help students to learn easily. The most important part of learning is to form perfect human beings who make this world a field of virtue to obtain a perfect life in the hereafter. One way to achieve this perfect life is with Islamic religious education. Religious education is a process of transfer of knowledge which is the main spearhead in conveying the teachings contained in the Qur'an and al-Hadith as the main source of Islamic religious teachings. Where with this education, the teachings of Religion can be passed on to the next generation and truly internalized in future generations. Just like Islamic Education according to Muhaimin (2004) which is an effort to make students able to learn, need to learn, are motivated to learn, want to learn, and are interested in continuing to study Islam, both to know how to have a true religion. as well as studying Islam as knowledge. Likewise, according to Zakiyah Darajdat quoted by Abdul Majid and Dian Andayani (Andayani, 2004), "Islamic

religious education is an effort to foster and nurture students so that they can always understand Islamic teachings as a whole, then live up to the goals, which in the end can practice and make Islam as a way of life.

Thus Islamic Education learning can be interpreted as an effort to make students able to learn, motivated to learn, willing to learn, and interested in continuously learning what is actualized in the Islamic religious curriculum as the needs of students as a whole which results in some relatively permanent changes in one's behavior either in cognitive, affective and psychomotor.

The meaning of learning Islamic education is guidance to become a strong Muslim and able to realize the teachings of Islamic education in everyday life so that they become perfect human beings. For this reason, the cultivation of Islamic education learning is very important in shaping and underpinning students. By instilling Islamic learning from an early age, one is expected to be able to form a strong, strong, and independent person to be guided by Islam.

Islamic Education Teachers have a very strategic role in improving the quality of education in Indonesia. They are expected to be able to develop the potential of students so that they can live and practice the teachings of Islam in everyday life. They are the main figures in instilling the values of Islamic teachings within the framework of forming attitudes and character, as well as akhlakul Karima's behavior through various learning models developed in schools.

However, Islamic Education in schools or madrasah, in its implementation, still shows various unpleasant problems. As with the learning process of Islamic Education in schools today it is still limited to the process of conveying knowledge about Islam. Only a few are directed at the process of internalizing Islamic values in students. This can be seen from the learning process carried out by the teacher who is still dominant in lectures. The internalization process does not automatically occur when certain values are understood by students. That is, the lecture method used by teachers when teaching Islamic education has a high chance of failing the process of internalizing Islamic values in students, this is because students are less motivated to learn Islamic education material (Saepul Hamdani, 2003: 1). Based on the results of research conducted by Beni Harsono, Suesanto, and Samsudi that teaching using the lecture method has several weaknesses such as a lack of mastery of the class because the teacher is busy writing on the blackboard, the pictures provided in learning do not attract students' attention, and students are confused in understanding the material taught. conveyed by educators due to the limitations of teaching aids. This can be said to be a weak point that is owned by every educator with the limitations they have.

Along with the development of the era of the advancement of information technology and technology, many changes have occurred. This increasingly rapid technological development affects the learning process in schools and also influences learning materials and the way the material is delivered in the teaching and learning process. Society's increasing demands on education and advances in science and technology have made it impossible for education to be managed through traditional patterns, besides being less relevant to the needs and demands of society, understanding how children learn, advances in communication media, and so on have given their meaning to educational activities. The use of technology in the world of education is very necessary for the context of teaching and learning activities. Because with a scientific, systematic, and rational approach, effective and efficient educational goals will be achieved (Nurfahmi, 2011).

In practice, current information technology has become part of the lifestyle of Indonesian society, this makes most teachers afraid that the role of a teacher will be replaced by technology even though technology can help teachers to be more creative, and innovative in conveying learning because their students live in their time. namely the development of technology, that's why educators are required to keep up with the times. Teachers who are not proficient in technology will be replaced, a sentence that criticizes us is of course constructive criticism, as educators to further improve our competence as teachers to always be up to date with the times.

Of course in many positive ways. So the teacher must be creative and innovative. It is intended that students do not get bored with the ongoing learning activities.

Therefore, the use of media is highly recommended in developing learning, especially learning Islamic education. Islamic education is intended to form students into human beings who believe and fear Allah SWT and have noble characters and increase spiritual potential. Likewise, Islamic education must be taught to children as early as possible so that they become children with Muslim personalities, and commendable and virtuous morals through the teachings of Islam (Istikomah, 2013).

Based on this, the existence of learning media can help the learning process to be effective and interesting because the role of learning media in the learning process is an inseparable unit in education. The suitability of the media for students is the main consideration because there are almost no media that can meet all age levels. Careful planning is needed so that the media can be right on target in its use (Riyana, 2009). Learning media is one of the components of the learning environment that can stimulate students to learn. Learning media can be used as a stimulus to increase the willingness of students so that they follow the teaching and learning process properly (Baharun, 2016).

However, on the other hand, technology also encounters many obstacles, including the lack of opportunities for students to develop psychomotor abilities, such as direct practice. Therefore, it is necessary to innovate new learning media to overcome these obstacles. Augmented Reality (AR) technology can be used as an alternative because this technology can be used as a learning medium by combining two or three-dimensional visual objects into a real world that will appear in real-time, so teachers can create fun, interactive and easy learning. used. Augmented Reality (AR) can also replace learning modules that are not yet in schools in virtual or virtual form. Students can still view and use the module as the original module but in virtual form. Through this breakthrough, more and more variations of learning media can be built to support learning activities in schools, especially in Islamic education learning. According to Mustaqim, 2017, the advantages of Augmented Reality (AR) are that it is more interactive, effective in use, can be implemented widely in various media, and simple object modeling, because it only displays a few objects, manufactured that doesn't cost too much and is easy to implement. operated. While the drawback of Augmented Reality (AR) is that it is sensitive to changes in viewing angles, there aren't too many makers, and it requires a lot of memory on the equipment installed.

Through the use of Augmented Reality (AR) in learning, it is expected to be able to attract students in the learning process and be able to improve students' cognitive learning outcomes. The benefits of using Augmented Reality (AR) media as learning media are as follows :

1. convey messages from educators to students in the learning process.
2. Media is the key to creating interaction in the learning process.
3. Means to improve accurate, clear, and interesting information communication
4. Improving the learning process and learning interest of students because it is entertaining by involving interaction with the five senses of students.
5. Increase students' imagination of the real world.

Literature Review

One of the media developments that have recently been developed is the development of learning media using Augmented Reality (AR). Along with the growth of increasingly advanced technology in every human life, the use of the latest technology in education must also occur. This of course aims to make the learning process in the classroom more enjoyable and varied. The use of Augmented Reality-based media will take students deeper into the material they are learning.

Especially with the existence of technology, especially smartphones which are now growing, Augmented Reality (AR) can use to become a fun learning capital for early childhood and other

students, thereby diverting misuse for negative things. As Burhaniddin said, in 2017, besides being a challenge, the existence of smartphones also brings great opportunities to develop useful technology in the field of education. One of the benefits that can be drawn from the existence of this technology is to use it as an effective, creative, and educative learning medium.

Augmented Reality technology is a visual technology that combines virtual objects or worlds into real-world displays in real-time. The use of Augmented Reality (AR) which is used as a medium and a source of learning in the learning process can improve the quality and quality of Indonesian education. Because education requires updating or innovating in learning which can change at any time to follow the trend of the times.

Learning media based on Augmented Reality (AR) is media that combine components in Augmented Reality that are technological in the form of images, internet, videos, and so on (Riyana, 2012). Augmented Reality (AR) is an interactive technology that can unite something real and virtual to produce three-dimensional (3D) objects that can be seen on the user's smartphone screen. The workings of Augmented Reality (AR) can detect images or images known as markers, using a camera on a cellphone or smartphone.

Learning media based on Augmented Reality (AR) in its use is expected to assist when a teacher delivers teaching material so that it is more interesting. This learning media can also be one of the right alternative media because it can convey teaching material not only theoretically but also displays complete image observations with descriptions of its parts, as well as images with attractive appearance, animations, videos, and others displayed with technology. Augmented Reality (AR), so can make students more creative, and active, and students' understanding of lessons is better, which can improve students' cognitive learning outcomes.

Based on what has been done by (Halidi et al., 2015), augmented reality-based learning media is a pleasure for students because it helps students become more active during the learning process, so it is strongly recommended that teachers use this media to improve their cognitive learning outcomes. According to (Wuetal., 2013) the implementation of Augmented Reality (AR) learning media can help students be able to reconstruct skills, and knowledge, and connect with real global situations. Augmented Reality (AR) can display three-dimensional examples from a device along with its animation, so students can see the shape of the fusion splicer with other parts. Augmented Reality (AR) can also display videos, as a result of which activities using the fusion splicer can be shown concretely to students. Apart from using a laptop or computer, the implementation of Augmented Reality (AR) can also be installed on a smartphone.

Augmented Reality (AR) media has been researched in Research and Development (RnD), qualitative, and quantitative ways. Research and Development (RnD) research was carried out by Tasrif et al (2020) in his research Augmented Reality (AR) media was developed using the Ar_Jarkom application in the computer network installation course. Qualitative research was also carried out by Ramadhan et al (2021) which explained an Android-based computer hardware recognition application using AR. In addition, it was also examined quantitatively by Jannah (2020) who explained the effect of using augmented reality media on student learning interest in the thematic subjects of class IV students with the theme of caring for living things at SDN 07 Bengkulu City.

The research was also carried out by Sandra J Kuryanti in designing interactive animations of procedures for performing ablution and Wajid prayers in Islamic Religious Education material using descriptive methods and collecting primary and secondary data. users in solving problems or facilitating the delivery of learning. In addition, the use of the application is also easy to understand by all people. With this interactive animation method, students no longer need to focus on books because, in this interactive animation, there is already an explanation of the existing discussion, students can repeat material wherever and whenever because this interactive animation already has audio sound in explaining the existing discussion material. Making interactive animations is designed to be as attractive as possible so that students are interested

and more motivated in understanding the material presented or provided by these interactive animations.

According to Akhma Putri, in the research "Development of Augmented Reality-Based Learning Media in Islamic education Subjects on Ablution Materials" the results of validation data analysis from material experts and media experts obtained an average score of 3.865 by material experts and 3.695 by media experts so that the application of Augmented-based learning media Reality (AR) is stated in the proper category to use. The results of the analysis of the attractiveness response test data obtained an average final score of 3.46 for the small group trial and 3.29 for the large group trial so the Augmented Reality Ablution Application developed as stated in the interpretation criteria was very interesting to use. The results of the effectiveness test of students before using the Augmented Reality Ablution application in Islamic education material get a percentage of 62.16667% and the results of the effectiveness test of students after using the Augmented Reality Ablution application get a percentage of 84.16667%. From the results of the effectiveness test that has been carried out by students, the Augmented Reality Ablution application is declared effective for use in the Islamic education learning process.

Based on several literature studies from Adib Setyo Mulyo, Sudjlswo, Azizah Fatmawati on Augmented Reality (AR) research about believing in Allah and His Messenger. And Siti Nurnaena and Septi Gurmiandari on research on the effectiveness of using Augmented Reality (AR) to increase Arabic vocabulary mastery and student learning outcomes at MAN 1 Cirebon school. Augmented Reality (AR) learning can increase students' motivation and enthusiasm for learning and can help students learn in an interesting and interactive atmosphere.

Method

a. Type of Research

This research uses a qualitative approach through the research method of literature study. A literature study is a data collection technique by conducting a review study of books, literature, notes, and reports that are related to the problem being solved (Nazir 1998: 112).

This research was conducted to support learning activities of the Islamic Religion which were motivated by the need for learning innovations according to the times in the digital era. The researcher conducted an instructional needs analysis by conducting a literature study from existing studies to find out the gap between existing learning media and the learning media needed by students and teachers today. The following is a picture of conventional learning media



with interactive learning media.

b. Object of research

The object of research in this research is teachers and students in an Islamic environment.

c. Focus and Description of Research Focus

1) Research Focus

To make it easier for readers to read the contents of the research, the authors focus on research on the following matters:

- a) Instructional Media
- b) Cognitive Improvement

2) Description of Research Focus

Based on the focus of this research, it can be described as follows:

a) Instructional Media

Learning media according to (Surayya, 2012) is a tool that can assist the teaching and learning process and serves to clarify the meaning of the message or information conveyed, so that it can achieve the planned learning objectives.

b) Cognitive Improvement

Anas Sudijono in his book Introduction to Educational Evaluation, argues that "the cognitive domain is the realm that includes mental (brain) activity". in the brain. Like thinking, remembering, and understanding something.

d. Mindset Diagram

The following is a framework diagram that outlines the stages or process of studying the influence of Augmented Reality (AR)-based learning media on Islamic Religion learning, Figure 3 is an image of the framework.

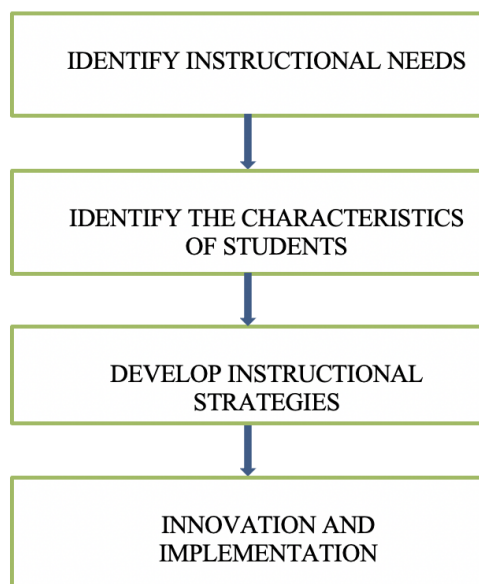


Figure 3 : Mindset Diagram

The following is a description of the stages or processes of the framework diagram:

1) Identify Instructional Needs

At this stage, the researcher conducted an assessment to find out the gaps in the learning media that had been developed with the learning media needed by students today.

2) Identify the characteristics of students

In this step an assessment of the learner is carried out, an assessment of the context in which they will learn, and where they will use it. The learner's skills and attitudes that the learner has will be used to develop instructional strategies.

3) Develop Instructional Strategies

Instructional design sections are used to develop pre-instructional learning, student participation, assessment, and follow-up activities.

4) Innovation and Implementation

The results at the above stage are used as the basis for creating the required interactive learning media.

e. Research procedure

In making learning media, some stages must be considered to produce media that can cover the shortcomings of the practicum module and can reach all students. The stages that need to be considered in making learning media applications are:

1) determine the concept and form of learning media,

2) determine the learning that students will achieve,

3) determine the relevance of the material to be loaded into learning media,

4) Determine the evaluation to determine the extent to which the success of the learning media was used.

The learning media developed in this study is Islamic learning in terms of knowing hijaiyah letters, performing ablutions, and performing prayers, based on Augmented Reality (AR) in the form of applications or videos, or games. The development of this learning media menu is as follows :

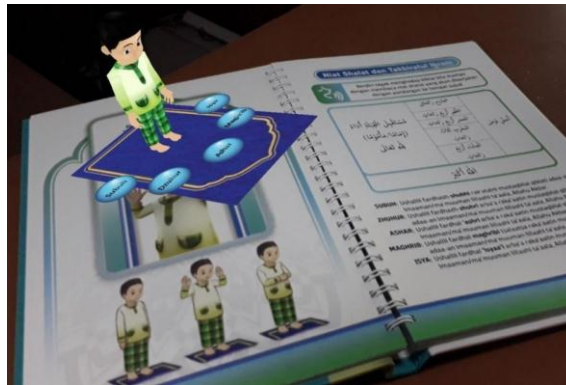
1) Basic competency menu

Basic competency menu to show the competencies that must be achieved after using this learning media. This menu contains the contents of the basic competencies contained in Islamic learning material. Basic competence is the minimum ability in each subject that must be achieved by students. For example, in this study, the basic competencies used are about prayer, how students can understand hijaiyah letters, procedures for ablution, and the correct procedure for praying and can apply prayer movements that are following the Al-Quran and Al-Hadits

2) Menu Augmented Reality (AR)

An augmented Reality (AR) menu, is a menu which is the result of combining virtual objects with real objects at the same time. This page contains a collection of Augmented Reality (AR) that has been prepared by the researcher, here the researcher collects Augmented Reality (AR) regarding hijaiyah letters, procedures for ablution, and procedures for prayer. Understanding and correct movements are included in Islamic learning material, so the examples of Augmented Reality (AR) images that researchers display are about these three materials. There is much more material that can be paired with Augmented Reality (AR) learning media, especially related to practicum-based Islamic learning, such as procedures

for pilgrimage, procedures for writing Arabic correctly, and others where there is a movement that supports Augmented Reality (AR).



Source: The Book iShalat Prayer

Figure 4 : Procedures for Prayer Using an Augmented Reality (AR) Based Application that has been scanned with a QR Code



Source: Article of “Pengembangan Media Pembelajaran Pengenalan Tata Cara Wudhu dan Shalat Berbasis Animasi 3 Dimensi”

Figure 5 : Augmented Reality (AR) Based Ablution Instructional Video



Figure 6 : Recognizing Hijaiyah Letters Based on Augmented Reality (AR) Applications that have been scanned with a QR Code

3) Material menu

Material menu, to support the Augmented Reality (AR) menu so that students more easily understand the material presented. This material menu serves to store learning materials, especially Islamic religious learning. For example, researchers use ablution material, where in ablution there are movements that students must know in more detail, and the movements in this ablution can be included in the form of an Augmented Reality (AR) learning video. By utilizing this technology, it is hoped that those who are just learning ablution movements and readings will be more enthusiastic and interested in prayer guidance which is equipped with Augmented Reality (AR) technology what is far more important is that users can see a real picture of prayer movements that resemble original.



Figure 7 : Reading Du'a



Figure 8 : Washing the Palms



Figure 9 : Gargling



Figure 10 : Washing the Nose



Figure 11 : Washing Your Face

Source: Article of "Pengembangan Media Pembelajaran Pengenalan Tata Cara Wudhu dan Shalat Berbasis Animasi 3 Dimensi"

4) Evaluation menu

Evaluation menu, as an evaluation to determine the extent to which the material is delivered through the media used. This page serves to improve learning materials that have not been achieved or have not achieved learning objectives related to Islamic learning. If students do not understand the previous material or their grades are not as expected, in this evaluation menu students will deepen their understanding, especially on the material they do not understand

Result and Discussion

a. Instructional Media

Learning media is a tool to support the learning process. Trianto (Rahayu, 2015: 6) explains that learning media is a learning tool or material as an intermediary between teachers and students in the learning process. Setiani (2018: 18) argues that learning media is a tool for stimulating thoughts, skills, feelings, and student learning attention so that a learning process will be created. Learning media has various functions, according to Sadiman (Tafonao, 2018: 107-108) the functions of learning media are as follows: 1) to clarify the presentation of messages; 2) to overcome space and time limitations; 3) to bring up student learning interest.

Interactive learning media by utilizing information and communication technology in the digital era is a promising factor in the success of a learning process. Now, teachers must understand technological advances, and play the role of facilitator for students, especially in the use of various learning resources so that teaching and learning activities are more effective, efficient, and not monotonous. However, the use of information and communication technology in

learning is not optimal. This can be seen that there are still a few schools that have made good use of the existence of information and communication technology as learning media. Therefore, the use of media is highly recommended in developing learning, especially learning Islamic Religious Education. One of the learning media that is expected to make students better understand the material obtained is one of them by using Augmented Reality (AR) technology.

b. Augmented Reality (AR) Media

Augmented Reality (AR) is a combination of virtual objects and real objects to be able to interact in real-time in the form of a 3D view. For example, when a television presenter brings news, there is an animation or virtual object that goes with it, so it is as if he is in the virtual world. When in fact it is a technique of combining the virtual world with the real world which is called Augmented reality (AR). When we relate Islamic Learning by using Augmented Reality (AR) as an alternative means in the current era Augmented Reality (AR) itself has its characteristics or characteristics, namely :

- 1) Able to combine virtual world objects with the real world.
- 2) Able to display images or animations in three dimensions.
- 3) Able to provide information in real-time.

There are two methods in Augmented Reality, namely Marker and Markerless. Markers are special markers that are made like Barcodes. Whereas Markeless is a method that does not need to use markers such as barcodes but direct objects such as learning videos and learning games (M.Hincaoie, 2021).

c. Cognitive Learning Outcomes

Learning outcomes are things that a person gets after going through learning activities in a certain environment. Ali (Fiteriani & Baharudin, 2017: 13) argue that learning outcomes are a process of changing individual behavior with their environment. Cognitive learning outcomes are student abilities related to intellectual learning outcomes after receiving a Bloom lesson (Mahananingtyas, 2017: 195). Cognitive learning outcomes are influenced by external and internal factors such as interests, attitudes, intelligence, learning strategies, learning environment, and motivation. (Rijal & Bachtiar, 2015: 17) There are six levels of learning outcomes in the cognitive domain used in elementary schools, namely knowledge, understanding, application, analysis, synthesis, and evaluation. Benjamin S. Bloom (Joni et al., 2014: 6). Thus, learning is a condition when students achieve the learning objectives that have been planned by the teacher. Learning outcomes, especially cognitive learning outcomes have an important role in learning because they can provide information about student progress in learning activities.

Augmented Reality (AR) Media on Cognitive Learning Outcomes Augmented Reality (AR) media can get students' cognitive learning outcomes because this media can provide space for students to imagine to improve cognitive learning outcomes. Julianti et al (2018: 6) explain that cognitive learning outcomes can increase both from the aspects of remembering, understanding, applying, and analyzing a lesson. In the aspect of remembering, students can remember hijaiyah letters. From the aspect of understanding, students can repeatedly understand the procedures for ablution and prayer by displaying augmented reality learning videos. From the aspect of applying, students can solve the questions given by the teacher by applying learning from the augmented reality media. From the aspect of analyzing, students can discuss with friends or teachers in analyzing learning. So, it can be concluded that Augmented Reality (AR) media plays an important role in students' cognitive learning outcomes.

Conclusion

Based on the research that has been done, it can be concluded that the application of Augmented Reality (AR)-based technology can increase student learning motivation. The learning material is following the learning objectives, so of course the learning method is not monotonous because it already has an attractive Augmented Reality (AR) display design that makes students not bored using this learning media. With the implementation of Augmented Reality (AR) in learning, students are more enthusiastic about applying Augmented Reality (AR) as an interesting learning method, then able to provide material features, and features of Islamic Religion learning exercises, and make students' knowledge treasury begin to increase more quickly.

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