



Application of Augmented Reality Based Freestyle Swimming Material Learning Media for Junior High School Students

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Abstract

This study aims to develop and apply learning media for freestyle swimming material based on augmented reality to junior high school students in the city of Padang Sidempuan. The type of research in this study is qualitative research with development studies used in a research must be based on the issues raised. The research procedure used in this study is in accordance with the steps for using the method Research and Development. The sample used in this study was PJOK teachers in Padang Sidempuan District. The results of this study indicate that out of 10 small group trial samples with a total score of 650 divided by a maximum score of 700 x 100%, it produces a presentation of 92.8% with the following criteria: Very Worth it. The results of the stage 2 trial on teachers are outlined through the formula for the percentage of the number of answers/maximum score x 100% with the following results. Of the 20 samples of the Phase II trial with a total score of 1.505 divided by a maximum score of 1.600 x 100% yield presentation of 94.0% with criteria Very Worth it. The conclusion in this study is eligibility based learning media augmented reality Freestyle swimming material for PJOK teachers declared appropriate and can be used for PJOK teachers in using media-based learning augmented reality freestyle swimming material.



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INTRODUCTION

Indonesian education implements the 2013 revised 2017 curriculum, in which this curriculum prioritizes material understanding, skills and character education (Mustafa & Dwiyo, 2020 ; Ahmad, 2016). To realize the idealistic ideals coveted by the 2013 curriculum, one form of implementation of the content curriculum is to use all learning resources by utilizing currently developing learning media. Learning media that develop in the field of science and technology will certainly support progress and positive changes in the field of education. Interesting learning media such as moving displays or displays will make it easier for students to remember and absorb material (Miftah, 2014) One example of learning media is textbooks used in the teaching and learning process.

Learning is a process of student interaction with the learning environment. Learning activities have unique characteristics in each subject (Kesuma, 2021; Putra et al., 2021; Rahmiati, 2021). For example, subjects that aim to provide knowledge and understanding will be different from subjects that aim to hone and equip students' motor skills. Similarly, learning that requires lower-order thinking skills is different from learning that requires higher-order thinking skills (Dewi & Faridah, 2022 ; Mustaqim et al., 2017a). Learning requires a process. The process of learning in various ways. With the rapid development of technology, several alternative ways have emerged to help school students better understand lessons at school both offline and online. Offline, there are some school students who choose tutoring institutions as an alternative place for additional learning. Meanwhile, online, there are currently many websites that provide video-based tutoring services. This service makes tutoring even easier, namely by studying online. In this way

students don't have to bother going anywhere anymore so they just have to be at home and in front of a cell phone/smartphone or laptop screen that is connected to the internet. (Mustaqim et al., 2017b) Physical, sports and health education are media to encourage physical growth, psychological development, motor skills, knowledge and reasoning, appreciation of values (attitude, mental, emotional, sportsmanship, spiritual and social), as well as habituation of a healthy lifestyle that leads to to stimulate the growth and development of balanced physical and psychological qualities (Vai et al., 2021).

Physical education is an integral part of education in general which affects the potential of students in terms of cognitive, affective and psychomotor through physical activity. This physical activity is a form of stimulation that is created to influence the potential of students in learning physical education in schools, starting from the level of early childhood education to secondary education. Through this physical activity it is hoped that educational goals which include the cognitive, affective, physical, and psychomotor domains can be realized (Kamiana et al., 2019). In physical education there are several materials taught to develop cognitive and psychomotor related to basic movements in PJOK learning. One of the lessons taught to students in junior high school is aquatic learning. Aquatic learning is learning that is carried out in water which aims to train students to gain progress in motor potential, cognition, affection and social skills(Gede et al., 2021).

One of the aquatic learning activities is swimming. Aquatic learning requires knowledge about the characteristics of growth and development of students, the principles of learning motion, the material to be taught, the method or approach used, as well as other

supports so that the learning process can be carried out properly and achieve the goals set. already set. Swimming ability can be influenced through playing approaches, authoritarian and democratic teaching styles to students (Haking et al., 2019) Learning to swim requires the right method. It is intended that learning outcomes can be achieved effectively and efficiently (Akhsani et al., 2021; Setyadewi et al., 2013)

There is Basic Competence (KD) in swimming sports in sports lessons at the junior high school level, namely understanding the concept of one swimming style with good conditions in water activities, with indicators mentioning several swimming styles. In its implementation students can practice one of the swimming styles with good coordination with indicators of doing footwork and demonstrating swinging motions or swimming arm pulls. Based on the Basic Competencies above and the problems that are currently appearing among junior high schools are the lack of interest of students in participating in the teaching and learning process, especially in basic swimming technique material, the lack of learning media that can complement student needs and the lack of development as an alternative step to complement and assist the learning process. According to (Permadi, 2013), the inhibiting factors for learning to swim consist of facilities and infrastructure as much as 62.5%, the risk of learning to swim as much as 69.6%, anxiety when learning to swim as much as 64.7%, fear when learning to swim as much as 73%, and environmental influences as much as 45%. So from these results it is known that risk factors, anxiety, and fear are more inhibiting compared to other swimming learning factors such as facilities and infrastructure and the environment, from this a solution is sought in teaching

swimming learning models by designing technology-based learning media.

In the era of industrial revolution 4.0. teachers are required to be able to develop and maximize technology to design media and learning models that are able to stimulate students to be able to carry out learning well. The progress of science and technology has helped many human activities, especially in the field of sports which has helped in the fields of training and competition. Humans themselves are the main subject of science and technology factors developed. Science and technology support helps school students to do online learning. The Covid 19 pandemic that hit Indonesia requires teachers to be able to design learning models that utilize technology, students are forced to study online using Android via the internet, not infrequently students in this era already have smartphone android. Students at school almost on average already have smartphones and have good skills in operating. This can be used by students and parents to support their children's learning process. technological developments can be integrated to optimize learning in the world of education. One way to optimize learning is to utilize technology in designing and implementing learning media.

Learning media are all forms of intermediaries used by humans to disseminate or convey ideas so that recipients can receive information. If the information conveyed contains teaching purposes, it is called learning media. In general, the benefits of learning media are to help students learn optimally and facilitate the interaction of educators with students so that learning objectives are achieved. The function of learning media is as a tool to help create an effective learning situation and lay concrete foundations from abstract concepts so that it can reduce verbal understanding and generate students' learning motivation. Fun

learning activities are strongly influenced by various factors, one of which is that the selection of learning media must be interesting for students to learn, interactive when used, but does not reduce the essence of the material presented. The development of increasingly advanced technology certainly affects various sectors of human life. This development also plays a role in the development of a learning media. Learning media is becoming more interesting and more concise even though it does not reduce the essence of the material. One of the developments in learning media that is currently still new is learning media using augmented reality.

Augmented reality is a technology that collaborates two- or three-dimensional virtual objects with the real environment and then projects these virtual objects in reality in real time. According to (Mustama, 2017) augmented reality is an application of merging the real world with the virtual world in two-dimensional and three-dimensional forms projected in a real environment at the same time. Augmented reality also known as augmented reality. This application is often applied in a game. Technology Augmented reality which is still relatively new is still little utilization in Indonesia. Augmented reality or what is often abbreviated as AR is a technology that combines virtual objects either 2 dimensions or 3 dimensions into a real 3 dimensional environment and then projects these virtual objects in real time Real Time (Prihandini et al., 2021).

By using augmented reality as an alternative learning media, it is hoped that in a learning activity it can be more attractive to students. Another benefit obtained is learning media that is more advanced by utilizing current technological developments. Augmented reality can be one of the solutions to overcome the problem of using technology in the education sector, especially in PJOK

learning. To strengthen the background that the researcher described, the researcher tried to conduct a literacy study through journal studies on media-based learning augmented reality, from the journal review found several journal studies regarding the development of learning media augmented reality (Farhani et al., 2021), explained that learning media based augmented reality can assist teachers in teaching learning through the application of learning media. According to (Educational Technology Research Journal et al., 2019b) explains that learning media augmented reality can improve students' ability to do learning in school.

From the results of the needs analysis carried out by the researchers on the problems that the researchers put forward on the background of the problems and journal studies, a questionnaire was distributed to PJOK teachers. Researchers are interested in conducting a needs analysis which aims to see how far media-based learning is augmented reality needed in teaching learning swimming material. From these results it is known through the following percentages: 100% Teachers say they have never used learning media augmented reality, 100% of teachers say they don't know what based learning is augmented reality, 100% Teachers want to implement based learning augmented reality, 100% of teachers say that teachers want new learning media based augmented reality, 100% of teachers say they want to have learning media augmented reality by using android.

From the results of the description of the background of the problem, journal studies and needs analysis that have been carried out by researchers, researchers are interested in developing media-based learning augmented reality Freestyle swimming material for junior high school students who can support the use of technology in education by developing learning-based media augmented reality so

that learning is carried out more interesting and interesting, because of learning media augmented reality developed has a renewal that is still relatively new.

METHODS

The type of research in this study is qualitative research with development studies used in a research must be based on the issues raised. The variables raised in the background of the problem will require a development and a method to solve it even though the research problem is the same, but sometimes a researcher can choose one or more types of research development that can be used to solve the problem.

The research procedure used in this study is in accordance with the steps for using the method Research and Development (Sugiyono, 2010). Then the procedure for this development research is summarized as follows:

1. Identify Potential Problems

Research can depart from potential problems. Potential is anything that when utilized will have added value (sugiyono, 2010). This research contains potential problems that can be raised, namely the development of science and technology, but Indonesia is still a consumer country for application product developers, especially in learning applications using AR.

2. Information Collection

From the results of the needs analysis carried out by the researchers on the problems that the researchers put forward on the background of the problems and journal studies, a questionnaire was distributed to PJOK teachers. Researchers are interested in conducting a needs analysis which aims to see how far media-based learning is from augmented reality Freestyle

swimming material for junior high school students is needed in teaching swimming material learning. From these results it is known through the following percentages: 100% Teachers say they have never used learning media augmented reality, 100% of teachers say they don't know what based learning is augmented reality, 100% Teachers want to implement based learning augmented reality, 100% of teachers say that teachers want new learning media based augmented reality, 100% of teachers say they want to have learning media augmented reality by using android.

3. Product Design

By using augmented reality as an alternative learning media, it is hoped that in a learning activity it can be more attractive to students. Another benefit obtained is learning media that is more advanced by utilizing current technological developments. Through Augmented reality can be one of the solutions to overcome the problem of using technology in the field of education, especially in PJOK learning, where in making these products researchers must consult with IT experts, media experts and PJOk teacher experts and a thesis proposal seminar will be held by researchers on this matter carried out to review the references and suggestions from the testers so that the product development that the researcher designed can be used and has broad benefits.

4. Product Validation

Product validation is an activity process to assess whether the product design, in this case the new work system will rationally be more effective than the old one or not Sugiyono (2013: 302). Products from research will be validated by experienced experts or experts to assess new products that have been

designed, in order to find out weaknesses and strengths.

5. Product Revision

After the product design has been validated by experts, the weaknesses of the product will be known. Weaknesses will be revised to be even better.

6. Product Trials

Product trials are carried out after the product has received an assessment by IT experts, media experts and PJOK teacher experts that the product being developed is feasible to be tested in the field. Product trials were carried out in a limited group. The purpose of doing this trial is to obtain information whether the product is a learning application augmented reality android-based which is effective and efficient in teaching learning PJOK swimming material. The data obtained from this trial is used as a reference for improving and perfecting learning applications augmented reality Android-based which is the final product in this research. By conducting this trial the quality of the product developed has really been tested empirically and is feasible to be used as a learning medium.

RESULT

The current rapid development of technology makes people always want to create in order to spur new innovations which can be applied and used effectively and efficiently. The development of this technology has become a necessity that cannot be separated from human life so that it stimulates the human mindset to be creative in technological developments, especially media based learning, augmented reality. This is what underlies that the next generation who have creative and innovative ideas for science and technology (IPTEK) are developing, so that this is the emergence of a generation

that will be able to continue the development of Science and Technology (IPTEK) so that it can continue from generation to generation. next generation. However, in the current reality where information technology is developing so fast and the existing facilities and infrastructure in schools have increased, it turns out that it has not been implemented effectively.

The teacher becomes the spearhead of learning when at school the transfer of knowledge provided will make students enthusiastic in carrying out the learning process. Teachers need a media that is expected to help and provide insight into the development of knowledge about media-based learning augmented reality in the PJOK learning process, so that later it can be applied to students. Because of the importance of using technology-based learning media, augmented reality is appropriate in the learning process.

Phase I Product Trial

Phase I trials were carried out on 10 junior high school teachers in Padang Sidempuan district. This aims to provide input and an assessment of the results of the trials conducted on samples to see the level of usefulness of learning-based media.augmented reality freestyle swimming material, so that it meets the theoretically and empirically feasible criteria. The data obtained is then used as a basis for efforts to make revisions at a later stage. Results obtained in the field after carrying out Phase I trials is the work based learning media augmented reality freestyle swimming material for SMP PJOK teachers who use it can work quite well and can be used as a reference for SMP PJOK teachers in implementing ict based learning media augmented reality freestyle swimming material in PJOK learning so that it is more interesting.

From the results of trials conducted by researchers on 10 SMP teachers in

Padang Sidempuan district, it can be seen that they have been classified in the form of questionnaires, by grouping them into 3 aspects, namely, video tutorial animation, media aspects for teachers in implementing media based learning. augmented reality freestyle swimming style material, the results of the use of media-based learning augmented reality freestyle swimming material so that there are a total of 14 questions, the results of the teacher's answers are grouped into 5 categories, namely SS (Strongly Agree), S (Agree), SD (Moderate), TS (Disagree), STS (Strongly Disagree) with an assessment 5,4,3,2,1. The results of the stage 1 trial on teachers are outlined through the formula for the percentage of the number of answers/maximum score x 100% with the following results. Of the 10 small group trial samples with a total score of 650 divided by a maximum score of 700 x 100%, it resulted in a presentation of 92.8% with the criteria Very Worth it. During the Phase I trial, researchers found findings in the field on ict based learning media augmented reality freestyle swimming material for middle school PJOK teachers that the researchers poured into Table 1.

Table 1. Research Findings

No	Research Findings
1	The sample looked confused at first when the researcher explained about the product developed by the researcher
2	The sample is still not able to run based learning media augmented reality freestyle swimming material
3	Samples have not been able to download media-based learning augmented reality freestyle swimming material
4	The sample suggests that the medium augmented reality made by example

Phase II Trial Results

Phase II trials were carried out on 20 SMP teachers in Padang Sidempuan district. This aims to provide input and an assessment of the results of trials conducted on samples to see the level of usefulness of learning media based on augmented reality freestyle swimming material to junior high school PJOK teachers as well as the effectiveness of media-based learning augmented reality freestyle swimming material to junior high school PJOK teachers, so that it fulfills the theoretically and empirically feasible criteria, so that it meets the theoretically and empirically feasible criteria. The data obtained is then used as a basis for efforts to improve the final video product based learning media augmented reality freestyle swimming material to junior high school PJOK teachers. Results that got in the field after carrying out Phase II trials was based learning media augmented reality freestyle swimming material Moston on SMP PJOK teachers is possible to use and meets the criteria referred to in based learning media augmented reality freestyle swimming material to junior high school PJOK teachers. From the results of the trials conducted, it can be seen and classified in the form of questionnaires, by grouping them into 3 aspects, namely, learning media based augmented reality freestyle swimming style material, media aspects for teachers in implementing media-based learning augmented reality freestyle swimming style material, the results of the use of media-based learning augmented reality freestyle swimming material so that there are a total of 14 questions, the results of the teacher's answers are grouped into 5 categories, namely SS (Strongly Agree), S (Agree), SD (Moderate), TS (Disagree), STS (Strongly Disagree) with an assessment 5,4,3,2,1. The results of the stage 2 trial on teachers are outlined through the formula for the percentage of the number of answers/maximum score x

100% with the following results. Of the 20 samples of the Phase II trial with a total score of 1,505 divided by a maximum score of 1,600 x 100%, it resulted in a presentation of 94.0% with the criteria Very Worth it.

DISCUSSION

Physical education is an educational process that utilizes physical activity to produce holistic changes in individual quality, both physically, mentally and emotionally. Physical education places great emphasis on aspects of education that are comprehensive in terms of health, physical fitness, critical thinking skills, emotional stability, social skills, reasoning and moral action. Physical education is an educational process through providing learning experiences to students in the form of physical activities, playing and exercising which are systematically planned to stimulate growth and development of physical, motor, thinking, emotional, social and moral skills, the provision of learning experiences is directed at fostering , while forming a healthy and active lifestyle throughout life.

Physical, sports and health education is an education system that prioritizes physical activities, games and sports which are used as media to achieve overall development of the individual. A similar explanation was also put forward by Andriyanto (2016: 4) that sports and health physical education implies learning that prioritizes physical activity as a medium in achieving a learning goal. Usage based learning media augmented reality freestyle swimming material aims to provide a role to students in learning that is useful for developing potential in students and can launch a learning process if school facilities and infrastructure are limited. The need for a new touch in teaching based learning media augmented reality freestyle swimming material requires teachers to be

more creative, this is supported by the results based learning media augmented reality Freestyle swimming material for junior high school students is needed in teaching swimming material learning. From these results it is known through the following percentages: 100% Teachers say they have never used learning media augmented reality, 100% of teachers say they don't know what based learning is augmented reality, 100% Teachers want to implement based learning augmented reality, 100% of teachers say that teachers want new learning media based augmented reality, 100% of teachers say they want to have learning media augmented reality by using android.

From the results of trials conducted by researchers on 10 SMP teachers in Padang Sidempuan district, it can be seen that they have been classified in the form of questionnaires, by grouping them into 3 aspects, namely, video tutorial animation, media aspects for teachers in implementing media-based learning. augmented reality freestyle swimming style material, the results of the use of media-based learning augmented reality freestyle swimming material so that there are a total of 14 questions, the results of the teacher's answers are grouped into 5 categories, namely SS (Strongly Agree), S (Agree), SD (Moderate), TS (Disagree), STS (Strongly Disagree) with an assessment 5,4,3,2,1. The results of the stage 1 trial on teachers are outlined through the formula for the percentage of the number of answers/maximum score x 100% with the following results. Of the 10 small group trial samples with a total score of 650 divided by a maximum score of 700 x 100%, it resulted in a presentation of 92.8% with the criteria Very Worth it. From the results of the trials carried out, it can be seen and classified in the form of questionnaires, by grouping them into 3 aspects, namely, tutorial animation videos, media aspects for teachers in

implementing learning based media. augmented reality freestyle swimming style material, the results of the use of media based learning augmented reality freestyle swimming material so that there are a total of 14 questions, the results of the teacher's answers are grouped into 5 categories, namely SS (Strongly Agree), S (Agree), SD (Moderate), TS (Disagree), STS (Strongly Disagree) with an assessment 5,4,3,2,1. The results of the stage 1 trial on teachers are outlined through the formula for the percentage of the number of answers/maximum score x 100% with the following results. Of the 20 samples of the Phase II trial with a total score of 1,505 divided by a maximum score of 1,600 x 100%, it resulted in a presentation of 94.0% with the criteria Very Worth it.

CONCLUSION

Based on the results of development research conducted then based on the data obtained from the result trials small group and trials large field as well as discussion of research results, it can be concluded that feasibility based learning media augmented reality Freestyle swimming material for PJOK teachers declared appropriate and can be used for PJOK teachers in using media based learning augmented reality freestyle swimming material.

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