ANALYSIS OF TEACHER NEEDS FOR THE DEVELOPMENT OF A MODEL FOR LEARNING SWIMMING TECHNIQUE BASED ON AUGMENTED REALITY (AR)

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Abstract: The objective of this study is to elucidate the requirements of educators in Palembang City for the creation of swimming technique learning models that are based on Augmented Reality (AR). Specifically, the study will focus on the 9-11 year age group. At the outset of the development of an AR-based learning paradigm, a needs analysis is conducted. A descriptive method with an educational survey type is employed in the research. Five instructors participated in the Focus Group Discussion (FGD) activities, and ten individuals completed a questionnaire that carried qualitative data types. The FGD results indicate that only three teachers have used video media obtained from YouTube, while 100% of the teachers have never implemented AR-based swimming technique learning. In the current era of digitalization, students aged 9-11 who are intimately familiar with technology, particularly smartphones; require AR-based learning as a novel approach to learning swimming techniques. The questionnaire results indicate that 80% of educators require media with visualization that is more realistic, engaging, and contemporary, such as AR-based learning. The content of the material must be visualized in order to create a realistic experience, as swimming material is associated with the introduction and coordination of movements. Therefore, a learning model that merely explains concepts and theories will not suffice, as 90% of teachers strongly agree that risk and anxiety factors are the most significant inhibitors to the improvement of students' swimming skills. The teacher recommends that researchers continue the development of an AR-based swimming technique learning model so that the results can be incorporated into their learning process, as indicated by these results.

Keywords : Learning Models, Swimming Techniques,*Augmented Reality*(AR)

INTRODUCTION

Children in the 9-11 year age group are included in the elementary school (SD) stage category. The development of students at the elementary school level is the foundation for entering the next stage of development. In the learning process, they are not only required to gain knowledge/cognition, but also develop all the potential they have so that they are ready to enter the next level. Therefore, in the learning process, students not only play an active role in acquiring knowledge but can also construct skills and attitudes so as to form quality individuals with developed abilities. The process of forming students with quality individuals also requires teachers as educators to improve the quality of the learning process and learning outcomes. One of them is by teachers who strive for students to interact more with interesting learning models to create a learning process with optimal results.(Yulifar & Agustina, 2020). Learning models are developed according to the needs and suitability of subject characteristicsPhysical Education, Sports and Health (PJOK)which is closely related to kinesthetic intelligence, namely intelligence that involves coordinating movements of the whole body and the ability to practice a series of movements based on brain commands.(Ishar et al., 2023).

Not only with regard to subject characteristics, the development of learning models must also take into account developments in the digitalization era which tends to be more popular with the current generation. Teacher creativity and innovation in developing digital-based teaching materials are also part of the post-Covid-19 learning transformation which links learning with the use of technology.(Agustina & Manalu, 2023). PJOK learning is education from, through, and in physical activity movements to grow and develop students' potential in cognitive, affective, psychomotor and social aspects.(Sun et al., 2017)which aims to provide a pleasant experience(Haerens et al., 2011)improve physical fitness(Gu et al., 2016), teaches basic movement skills and sports techniques(Goodway et al., 2014), providing stimulation of brain development (intellectuality)(Zhao & Li, 2018), growsocial attitudes(Gordon & Doyle, 2015), and spiritual balance(Culpan & Stevens, 2017). Therefore, in learning PJOK, especially at elementary school level, students are not only required to master concepts and theories but also have skills in physical and sports fields.(Sudarsinah, 2021). Swimming lessons are part of the learning program. Based on a survey regarding the interest of class V students at SD Negeri 216 Palembang towards swimming activities, it showsThe high percentage is the internal interest factor of 79.80%, external interest of 80.40%. Judging from the percentage, each interest factor has a fairly high contribution in influencing interest in swimming(YIK Sari & Imansyah, 2020).

Swimming, which is part of water activities, is a sport or activity carried out in water. Swimming activities require speed and mastery of the principles of swimming mechanics because they are related to water as a medium so that there is resistance and encouragement from water currents(Imansyah, 2017).The creation of more efficient and effective swimming movements is due to the combination of hand movements with foot movements and breathing techniques. Based on the pattern of the combination of

movements, these movements are grouped into swimming styles. Material relating to swimming style is part of the PJOK learning material at elementary school level, where not only do you have to know the concepts and material, but students are also required to be able to practice it. If you reflect on the various swimming styles, they have different variations and characteristics, not to mention practicing them directly in the swimming pool, of course they have their own obstacles in applying them, apart from having to be able to regulate their breathing, they also have to be able to regulate their body position. It is possible for these obstacles to be overcome if students can understand the theory well. Moreover, elementary school age children at least have swimming skills so that they can face certain situations when in water that might be dangerous. As expressed byAdikarsa and Supriyono (2022)that students' lack of skills in swimming activities is due to several obstacles, namely feelings of anxiety and fear, tendency to be hyperactive and lack of understanding about the use of appropriate swimming techniques.

Efforts made by teachers to instill understanding and improve swimming skills in students can be done with strategies in utilizing technology. One of them is an AR-based learning model via smartphone. AR is a technology that allows people to visualize the virtual world as if they can be connected to the virtual world and interactions can occur (Jacobs, 2012). AR is a technology that combines the virtual world and the real world in 3D (three dimensions) and can be interactive based on real time(Lusa et al., 2020;Ramadhan et al., 2021).

The existence of an AR-based learning model via smartphone is the development of a learning model that is packaged attractively with technological innovation that is very close to students in the era of digitalization. In line with this, several previous studies haveApplying AR was once done by Yudistira, Purba, Munthe,(Yudhistira et al., 2021)entitled "Interactive Learning Media: Getting to Know Football Sports by Applying Augmented Reality (AR)" shows that AR is able to make information seem real; AR learning media can improve the learning process and facilitate user understanding and by implementing AR into learning media, it is hoped that it can help attract the attention of students, especially children.

Based on several previous studies, researchers analyzed that there is no learning model that can be used by elementary school students for learning in the classroom or for extracurricular swimming activities, especially AR-based breaststroke and freestyle. Based on this, the researcher will develop an AR-based swimming technique learning model and in this research, the researcher first conducted a survey regarding "analysis"The need for teachers to develop a swimming technique learning model based on Augmented Reality (AR), especially for the 9-11 year age group in Palembang City."

METHOD

This research was conducted using qualitative descriptive research with survey research methods(Creswell, 2017). In this research, researchers conducted a needs analysis as an initial stage in conducting further research with development research, namely developing an AR-based swimming technique learning model forage group 9-11

years in Palembang City. Therefore, this research involved 15 elementary school teachers for PJOK subjects which were divided into two types of data collection, namely 5 teachers involved in FGDs and 10 teachers filling out questionnaires online. The results of the FGD and the results of respondents filling out questionnaires were then analyzed qualitatively to determine teachers' needs for AR-based swimming technique learning models.

RESULTS

Based on the results*Focus Group Discussion*(FGD) as a preliminary study conducted on January 19 2024 with 5 elementary school teachers in Palembang, namely BTS (SD Al Azhar Palembang), NP (SD Kusuma Bangsa Palembang), DJ (SD Singapore Intercultural Schools Palembang), A (SD Maitreyawira Palembang), and HW (SDN 55 Palembang). According to them, students have high enthusiasm and interest in water sports, but there are several obstacles when practicing swimming technique learning, especially for children who are too active because they don't listen carefully to the instructions so they need to emphasize the material repeatedly. Therefore, media is needed as a messenger, in this case an interesting and unique swimming technique theory so that students are impressed to listen to the theory and understand it. There were 3 teachers who had used video media that they downloaded from YouTube but it was still not optimal because students had often experienced video-based learning so students were less interested. The AR media that researchers will develop is a suitable alternative in the era of digitalization with students aged 9-11 who are very close and literate with technology, especially smartphones. This can also stimulate students' imagination and creativity. The three teachers strongly agree that AR is applied both in class and extracurricularly.

Not only that, the FGD also involved teachers as well as swimming coaches and owners of the Tirta Barokah Palembang private course club. He believes that providing a stimulus for learning before practice by watching swimming technique simulations is one way to overcome the anxiety of children who tend to be afraid of water, especially if the video shown uses interesting media such as AR. Children need to be educated first before practicing and to minimize risks and anxiety, children need swimming aids, such as body and hand floats. Another fellow teacher also stated that the media for conveying theory is not only books according to available publishers but also media with visualizations that are more real, more fun, and modern because sports, in this case swimming, are related to the introduction and coordination of movements. AR media is a suitable and appropriate choice for children aged 9-11 years, this is because children of this age are able to think rationally, can respond well, especially to technological developments such as smartphones. AR media can be designed attractively according to the material and child's development stage and is reliable for Android and other types of smartphones.

Questionnaires were also distributed to elementary school teachers for PJOK subjects in Palembang with a total of 10 respondents. Based on the results of the questionnaire, data was obtained as in table 1 below.

Table 1. Recapitulation of teacher needs analysis questionnaire resultstowards the development of an AR-based swimming technique learning model

No	Questions (Aspects)	Teacher Response	Percentage
1	Do the school facilities support the use of digital-based media?	Yes No	100% 0%
2	In PJOK learning, do you often use digital-based learning models?	Very often Often Often enough Never	0% 10% 80% 10%
3	For swimming technique material, is there sufficient time for students to master these skills?	Adequate Adequate Inadequate Inadequate	0% 0% 70% 30%
4	Does mastery of swimming techniques also need to be developed in learning activities outside the classroom (extracurricular activities)?	It is necessary Simply Necessary Less necessary No need	90% 10% 0% 0%
5	Apart from time, are there any obstacles for students in mastering swimming technical skills?	There is There isn't any	100% 0%
6	In your opinion, what are the most common obstacles in learning swimming techniques?	Inadequate facilities Risk factors and anxiety due to lack of mastery of theory	10% 90%
7	In your opinion, what media-based learning model is appropriate and will be interesting for students in learning swimming techniques?	Textbook Module Comic Videos Augmented Reality (AR)	0% 0% 10% 10% 80%
8	Have you ever used an AR-based learning model in learning PJOK?	Once Never	0% 100%
9	The AR-based swimming technique learning model makes it possible to present material easilyvisualization that is more real, more fun, and modern. Do you agree if this is applied to learning in the classroom or in extracurricular activities?	Strongly agree Agree Simply agree Don't agree Don't agree	90% 10% 0% 0% 0%
10	Will students play an active role and be able to master swimming technique skills by implementing an AR-based swimming	Strongly agree Agree Simply agree	70% 10% 10%

	technique learning model?	Don't agree Don't agree	10% 0%

DISCUSSION

Based on the results of the needs analysis as an initial stage in the process of developing a further AR-based swimming technique learning model, it is known that this development is really needed as an effort to increase students' understanding of theories, concepts and skills in mastering swimming techniques. Based on the results of researchers' research, the development of an AR-based swimming technique learning model has never been carried out, but research on the development of augmented reality-based learning media has been carried out, such as in researchPramono & Setiawan (2019);Yuliono et al. (2019);Usmaedi et al. (2020);Panduwinata et al. (2021);Amdani et al. (2022); AndSungkono et al. (2022)regarding the development of AR application technology to improve student learning processes and research results show that this development produces interesting, easy-to-understand learning media. The application is very effective as a medium, and is very suitable for use because AR makes students feel the process in real life so that it can stimulate children's imagination and increase students' motivation to learn.

The next research was also carried out byQorimah et al. (2022);(Yudha et al., 2023); And(Cahdriyana & Nurnugroho, 2023)who carried out an analysis of the needs for AR-based learning media as an initial stage in developing it. This research can be used as a basis for developing an AR-based learning model. Research conducted on teachers and students shows the results of the analysis that teachers and students agree with AR-based mediaas a solution for students in the learning process. As a follow-up, the suggestion put forward is to develop media in the learning process in class or can be used in extracurricular activities.

There is also research on the development of AR applied in PJOK learning, as in researchMoreno-Guerrero et al., 2020;Zhe & Suparjoh, 2023; AndAfriani et al., 2023which shows that applying the use of AR-based media in physical learning is very feasible and effective.Swimming lessons that contain a lot of movement in the water will be better if using AR-based media because they look more real and concretize abstract concepts with a display that attracts students' interest so they are easy for students to understand.(Firdanu et al., 2020). Likewise in researchImansyah (2019)And(Imansyah et al., 2022)which indicates ifSwimming skills show better results because the swimming learning method uses media. Therefore, for the sustainability of research, it is important to develop an AR-based teaching model so that the learning model is more heterogeneous and stimulates teacher creativity to always innovate in PJOK learning.

CONCLUSION

PJOK learning with swimming material that will be developed has the potential to become a product that is valid, practicable, and effective. In this case, it is based on augmented reality and visual reality teaching materials. Therefore, it has the feasibility

to be implemented. Subsequently, it is anticipated that the outcomes of the forthcoming investigation will enhance and address educational requirements, particularly those related to PJOK instruction in elementary schools.

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Acknowledgment

I am grateful to the agencies and parties that provided support for this research, particularly the PJOK instructors who served as research respondents.

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