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Developing Underwater Video Media in Learning Basic Swimming Techniques

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ABSTRACT

The purpose of this research was to develop instructional video media for basic swimming techniques using the ADDIE model. The development aims to (1) identify the feasibility level of the media through the responses of experts (2) the effectiveness of the media developed. The data were collected by using questionnaire and a field testing. The result of experts' judges showed that content experts 64% (enough), learning media experts 76% (good) and learning design experts 78% (good). The results of the study were based on the responses of individual students 83% (good), small group 98.67% (very good), and large group 89.42% (very good). The students' swimming performance was assessed based on distance, hand, feet, breathing, and coordination movements. The result of field testing showed that students' swimming performance after the implementation of underwater video media was better than before the implementation (Sig.2-tailed=.001). Thus, the underwater video media is suitable to be used in teaching basic swimming technique based on the result of expert and field testing. This development research is expected to help in making, using and creating creative learning and to solve problems, especially in the material of swimming theory and practice.

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1. INTRODUCTION

Swimming is one part of the curriculum and is included in learning, specifically in physical education (PE). According to Wahyudi et al. (2021), physical education (PE) is one of the compulsory subjects in schools. The parties involved in this swimming lesson are students, teachers, and infrastructure. The infrastructure facilities in question include: swimming pools, surfboards and buoys. Sports and health physical education teachers have very heavy duties and responsibilities from these

elements. Physical education teachers, sports, and health are the most essential aspects of achieving learning success. Therefore, sports and health physical education teachers must have sufficient abilities and skills so that swimming lessons can be conveyed to students and meet the curriculum or goals set.

In PE, swimming is the most of courses that require practice. But, Covid-19 created a gap in the learning process because there are specific things that cannot be conveyed in the learning. Learning cannot run optimally because teachers cannot assist directly considering learning takes place online (Gherheș et al., 2021; Jeong & So, 2020). Movements carried out in the water (underwater) are often left untouched in the explanations of PE teachers; therefore, it is very important to be able to facilitate the learning of prospective PE educator students with relevant learning media. Through the media, students will see examples and further will be able to mimic the movements to be trained. Besides that, there are many facts in the field of PE teachers who do not have a background in swimming athletes who are unable to teach basic swimming techniques specifically to help students master the technique properly and correctly (Olstad et al., 2021).

Looking at the problems of teaching swimming during online learning, a visual media needs to be developed to support the teaching and learning process of swimming basic techniques. Video is a type of learning media can be used for the learning process and significantly improved the teaching and learning process (Heri et al., 2020; Winslett, 2014). Therefore, the current study was aimed at (1) developing an underwater video media, (2) testing the quality of the underwater video media through experts' judges, and (3) the effectiveness of an underwater video media towards students swimming ability.

This study raised the development of video media for learning basic swimming techniques. The material was chosen because the basic swimming technique is the basis of the existing swimming material. Arifin (2013) states that before learning to swim, students should get to know the styles of swimming that are generally used. These styles include: 1) freestyle, 2) butterfly, 3) backstroke, and 4) breaststroke. These four styles are the styles of swimming that are competed in swimming championships. If students are familiar with the style of swimming, then the next step is to start with how to recognize water and what to do if they want to learn to swim.

Previous similar research that has been carried out in the research of Wahyudi et al. (2021) who studied PE learning experiments using Zoom for swimming material. The results of this study indicate that online learning using the Zoom application can be applied in PE by the way the teacher packs it in such a way to attract students' interest in learning by explaining using PPT and showing videos during online learning. In addition, which can be used to demonstrate movements in the psychomotor realm (practical). After being analyzed, the research conducted by Wahyudi et al. (2021) is still too useful because doing swimming lessons via Zoom with PPT media is not an innovation. Other things are needed that can convey material that requires motion and modeling. On this basis, this development will be a complement to existing research.

Not only as development in PE, but this research also aims to enrich the treasures of educational science, especially in PE. A good wealth of references will make it easier for future researchers to study similar topics. In addition, teachers in schools are expected to be able to use the development made as a medium in their learning. Because PE learning cannot be done only using theories. The right media is also needed, such as the Underwater Video Media in Learning Basic Swimming Techniques developed.

2. METHODS

Design

The development of underwater video media in this lecture on the theory and practice of basic swimming learning used the ADDIE model. In developing video-based learning media using the ADDIE model, the development procedure carried out consists of several stages. To be more complete, here are the stages in developing video-based learning media. The stages in developing the ADDIE model of instructional video media are as follows.

1. The Analyze Stage.

The analysis here was the first step and became the basis for developing underwater video media for swimming theory and basic learning practices. In this study, needs analysis was conducted through interview with PE instructors.

2. Planning Stage
   This phase is implemented after the analysis process is completed (Adanan et al., 2020). This stage was the design planning stage of selecting and determining the design made and starting to design the instructional video media script. Designing a product was conducted in two stages, namely selecting and implementing the software used, and developing a storyboard.
3. Development Stage
   At the development stage, it was done by developing instructional video media. The development stage was the stage for compiling the course material that has been prepared and the collection of the required subject matter and materials for making media as supporting aspects such as text, images, animation, audio, and video. The development of the subject matter was carried out by using various sources of source books that are relevant to health material in PE subjects. Meanwhile, the collection of images, audio, and video was obtained through self-creation, personal archives, and downloading via the internet and direct capture in the field.
4. Implementation Stage
   After the development stage, the implementation stage was carried out which was a concrete step to implement the learning video media that has been made. This means that at this stage everything that has been developed will be set in such a way as to suit its role or function so that it can be implemented. In implementing the product, the steps carried out were as follows: a). Coordinate with the study program and other class lecturers who teach so that there is good collaboration between lecturers and research. b). Prepare the tools needed in the application of media such as computers/laptops, LCDs, speakers and so on. c). Install media onto DVD, print DVD cover and test learning video media.
5. Evaluation Stage
   The evaluation stage aimed to see the extent to which the products made can achieve predetermined goals and objectives. At this stage, an assessment of the media resulted from the validity of three experts, namely content experts, instructional media experts, and learning design experts. Each expert would be given an assessment instrument according to their area of expertise. After the revision was carried out, the next trial would be carried out by individual trials, small group trials, and large group trials.

Data Analysis

In this development research, three data analysis techniques were generally used, namely qualitative descriptive analysis techniques, quantitative descriptive analysis, and inferential analysis. This qualitative descriptive analysis technique was used to process data from the review results of subject experts, subject design experts, instructional media experts and student trials. This data analysis technique was carried out by grouping information from qualitative data in the form of input, response, criticism, and suggestions for improvement contained in the questionnaire. The results of this analysis are then used to revise the product being developed.

The result of expert judges then collected and analyzed using descriptive statistics to identify the mean score. A set of category was also developed by adopting category developed by Darmaji et al., (2019) in identifying the qualification of the mean score based on as can be seen in table 1.

Table 1. Category of Perception

Interval Mean Score	Category
20.0 – 36.0	Vary Not Good
37.0 – 52.0	Not Good
53.0 – 68.0	Enough
69.0 – 84.0	Good
85.0 – 100.0	Very Good

Source: Darmaji et al., (2019)

3. FINDINGS AND DISCUSSION

In the analysis step, interview was conducted with four PE instructor. The result of interview identified three important point. Those are: (1) lack of media in teaching swimming; (2) lack of knowledge of basic swimming technique; and (3) lack of capability of developing a media for teaching swimming. The results of the interviews also found that teachers expected visual-based learning media to be used during the online learning period. The results of the analysis stage provide a strong basis for the need for the development of video media to support the teaching and learning process.

Next, on the stages of developing, the media were producing storyboards and flowcharts as the basis for developing media products, integrating swimming basic technique material and making videos, editing and producing. The developed media is supported with audio and visual image. The audio was to give explanation of the technique being taught meanwhile the visual image was to give proper example to the students on how to swim using freestyle, backstroke, Breaststroke and butterfly. Besides that, the media also contain explanation and example of the correct hand, feet, breathing and coordination movements.

Figure 1. The Design of Underwater Video Media

After the media is developed, it is then tested and evaluated. The implementation and evaluation of the media developed were conducted through expert judges and field testing. In terms of expert judges, there were three experts involved. They were media expert, design expert and learning expert. The result of expert judges can be seen in table 2

Table 2. Expert Judges

Expert	Evaluation Score	Qualification
Content	64	Enough
Instructional Media	76	Good
Learning Design	78	Good
Overall	72.76	Good

From table 2, it can be seen that in terms of content, the average value given by the expert is 64, which means that in terms of content, the underwater video media is in enough category. In terms of instructions and design, the average scores obtained are 76 and 78 which belong to good qualification.

The media developed was field tested. In conducting a field test, an experiment design was used. The media was used to teach basic swimming skills in one selected high school in Buleleng, Bali. The design of the experiment was pre-test posttest design. The students' swimming skill was assessed in terms of distance and the movements. There were thirty-six students involved in this process. The result is presented in table 3.

Table 3. Swimming Distance Score

Components Assessed	Pretest	Posttest
Freestyle Distance	M=57.50	M= 65.55
	Sd.= 15.14	Sd.= 12.40
Backstroke Distance	M=42.77	M= 51.11
	Sd.= 16.01	Sd.= 15.07
Breaststroke Distance	M=60.55	M= 67.08
	Sd.= 13.97	Sd.= 11.54
Butterfly Distance	M=46.94	M= 53.88
	Sd.= 16.22	Sd.=14.29

From table 3, it can be seen that the average distance achieved by students before the implementation of underwater video media with freestyle is 57.50 meters, backstroke is 42.77 meters, breaststroke is 60.55 meters and butterfly is 46.94 meters. The students then were introduced and taught with underwater video media. After the implementation of underwater video media, the students' swimming distance was reassessed. The results showed that the distance achieved by students were improved. The distance of freestyle is 65.55 meters, backstroke is 51.11 meters, breaststroke is 67.08 meters, and butterfly is 53.88 meters. A paired sample t test was conducted to find if the distance difference was significant or not. Before conducting the t test, a normality distribution of the data was also assessed. The result can be seen in table 4.

Table 4. Pretest and Posttest Distance

Pair	Normality (Kolmogorov-Smirnov)	Mean	D F	t test Sig. (2-tailed)
Freestyle Pretest	.099	-8.05556		.001
Freestyle Posttest	.081			
Backstroke Pretest	.200*	-8.33333		.001
Backstroke Posttest	.200*			
Breaststroke Pretest	.154	-6.52778	35	.002
Breaststroke Posttest	.151			
Butterfly Pretest	.122	-6.94444		.001
Butterfly Posttest	.092			

Values of higher than .05 in normality test indicates that the data are normally distributed (Pallant, 2016). Thus, a paired sample t test can be continued. Table 4 gives the information about the difference of distance between pairs. The difference of distance is -8.05 for freestyle, -8.33 for backstroke, -6.52 for breaststroke and -6.94 for butterfly. A significant difference is indicated if the value of Sig. (2-tailed) is lower than .05. From table 4, it can be seen that the value of Sig. (2-tailed) for all pairs are lower than .05. This means that the difference of distance between pretest and posttest is significant. It can be said that the implementation of underwater video media was significantly improved the swimming distance.

Besides assessing the underwater video media based on the distance, the movements of hands, feet, breathing and coordination. The result can be seen in table 5.

Table 5. Movements Score

Components Assessed	Pretest	Posttest
Hands	M=3.13	M= 3.66
	Sd.= .930	Sd.= .632
Feet	M=2.77	M= 3.75
	Sd.= .831	Sd.= .649
Breathing	M=3.27	M= 3.69
	Sd.= .848	Sd.= .576
Coordination	M=2.75	M= 3.16
	Sd.= .840	Sd.=.845

There were five scales used to assess students' movements. In table 5, the students' mean scores in pretest were 3.13 for hand movement, 2.77 for feet movement, 3.27 for breathing movement, and 2.75 for coordination movement. After the implementation of underwater video media, the students' score became 3.66 for hand movement, 3.75 for feet movement, 3.69 for breathing movement, and 3.16 for coordination movement. The test was continued with normality test and paired sample t test as can be shown in table 6.

Table 6. Pretest and Posttest Movements

Pair	Normality (Kolmogorov-Smirnov	Wilcoxon Sign Rank Test			Asymp. (Sig-2 tailed)
		Negative Ranks	Positive Ranks	Ties	
Hand Pretest	.001	1	14	21	.001
Hand Posttest	.001				
Feet Pretest	.001	0	27	9	.001
Feet Posttest	.001				
Breathing Pretest	.001	0	13	23	.001
Breathing Posttest	.001				
Coordination Pretest	.001	0	14	22	.001
Coordination Posttest	.001				

The result of normality test showed that the data are not normally distributed (< 0.05). Therefore, a non-parametric test was conducted to identify the significant mean difference between pretest and posttest. A Wilcoxon Sign Rank Test was used to identify the result. There are three ranks namely negative which indicated a decreased score, positive which indicates an improved score and ties which indicates no decreased score nor improved score. The result of Wilcoxon sign rank test showed that 1 negative rank, 14 positive rank and 21 ties in terms of hand movement. In terms of feet movement, there is no negative rank, 27 positive ranks and 9 ties. For breathing movements, 0 negative rank, 13 positive ranks and 23 ties were identified. No negative rank, 14 positive ranks and 22 ties were identified in the score of coordination movements. Table 6 also presents the result of Asymp. (Sig-2 tailed) as the indicator of significant mean difference between pretest and posttest. A value of lower than .05 indicates that the mean difference is significant.

The development of video media in this study aims to support the teaching and learning process in online situations. With the video, students can observe and learn directly the basics technique of swimming. From the results of expert judges, in general the developed media is in good category (Mean score=72.76). A good learning media will help students understand the learning content and will have a positive impact on the achievement of the desired competencies (Ren, 2017). A good and interesting learning media will also increase student motivation in learning (Puspitarini & Hanif, 2019). The use of

digital and electronic learning media can also support the implementation of online learning during this pandemic (Coman et al., 2020)

The result of field testing confirmed that there was a significant mean difference before and after the implementation of underwater video media in terms of distance, and movements of hand, feet, breathing and coordination (Sig. 2-tailed < .005). This indicates that the media was effective to improve the students' basic swimming skill. The use of media for teaching sports has been conducted and showed a positive result. Sheng and Sheng (2018) found that students' offensive understanding ability and defensive understanding ability in basketball was improved greatly after the implementation of multimedia teaching system with video. Furthermore, the use of digital media in physic education greatly offer opportunities to improve the quality of the learning when the media is designed based on the courses objectives (Greve et al., 2020).

The results of the development of the underwater video media show that the media can be used to support the learning process of basic swimming techniques and has been proven to be able to improve students' basic swimming skills through the results of expert judges and direct implementation in the field. By using the media developed learning becomes more interesting and interactive. This directly influences the learning outcomes. The media developed in this study is still far from perfect. Improvements are needed both in terms of content, design and instructions. Further study is acknowledged to develop a learning media for teaching different subjects of physics education and integrated a more complex features in the media developed such as virtual reality.

4. CONCLUSION

The development of video media in this study is can be implemented, it can be seen from the results of experts' judges that content experts gives 64% (enough), learning media experts 76% (good), and learning design experts 78% (good). The results of the study were based on the responses of individual students is 83% (good), small group 98.67% (very good), and large group 89.42% (very good). This development research is expected to help in making, using, and creating creative learning and to solve problems, especially in the material of swimming theory and practice. Even tough, the media developed is still far from perfect. Improvements are needed both in terms of content, design, and instructions. Therefore, further research is expected to make similar developments more innovative, to improve the quality of PE, especially in swimming materials.

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