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Development of a Multimedia Learning Module (MLM) Based on Local Wisdom of the Banga Welu Game to Increase Student Motivation in Physics Learning

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ABSTRACT

This research aims to: (1) produce a multimedia learning module (MLM) based on the local wisdom of the Banga Welu game that is suitable and valid for use in learning, and (2) determine the effectiveness of a multimedia learning module (MLM) based on the local wisdom of the Banga Welu game in increasing motivation students in learning physics. This research is included in Research & Development (R&D) research according to the development design from 4D. The research design used in product trials is a pretest-posttest control group design. The subjects in this research consisted of 104 instrument and product testing students. Product validation was carried out using an ideal standard score (Sbi) and General Linear Model (GLM) with a significance level of 0.05 to test the product's effectiveness in increasing students' motivation in learning physics. The validation results of the validators show that the multimedia learning module (MLM) based on the local wisdom of the Banga Welu game is very suitable for use both in terms of the media aspect and the material aspect contained in it. The GLM with effect size result of students' physics learning motivation is 0.242 and is in the medium category. The results of this effect size test show that the multimedia learning module based on the local wisdom of the Banga Welu game effectively motivates students to learn physics.

INTISARI

Penelitian ini bertujuan untuk: (1) menghasilkan modul multimedia pembelajaran (MLM) berbasis kearifan lokal permainan Banga Welu yang layak dan valid digunakan dalam pembelajaran, dan (2) mengetahui keefektifan modul multimedia pembelajaran (MLM) berdasarkan kearifan lokal permainan Banga Welu dalam meningkatkan motivasi siswa dalam belajar fisika. Penelitian ini termasuk dalam penelitian Research & Development (R&D) sesuai desain pengembangan dari 4D. Desain penelitian yang digunakan dalam uji coba produk adalah pretest-posttest control group design. Subyek dalam penelitian ini berjumlah 104 siswa pada uji instrumen dan uji produk. Validasi produk dilakukan dengan menggunakan standar skor ideal (Sbi) dan General Linear Model (GLM) dengan taraf signifikansi 0,05

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untuk menguji keefektifan produk dalam meningkatkan motivasi siswa dalam belajar fisika. Hasil validasi validator menunjukkan bahwa modul multimedia pembelajaran (MLM) berbasis kearifan lokal permainan Banga Welu sangat layak digunakan baik dari aspek media maupun aspek materi yang terkandung di dalamnya. GLM dengan hasil effect size terhadap motivasi belajar fisika siswa sebesar 0,242 dan berada pada kategori sedang. Hasil uji effect size ini menunjukkan bahwa modul multimedia pembelajaran berbasis kearifan lokal permainan Banga Welu efektif dalam memotivasi siswa belajar fisika.

A. Introduction

Learning motivation is an important factor in learning activities. Learning motivation has an important influence on children's learning. Without learning motivation, learning is in vain. Motivation is also needed in the learning process because it is a parameter in determining the success of a learning process [1]. Teachers will easily convey lesson material if students' learning motivation is high [2]. This happens because learning motivation aims to move and encourage students to take part in teaching and learning activities [3]. Learning motivation plays an important role in creating the effectiveness and meaningfulness of learning [4][5].

The results of the preliminary study show that students' learning motivation is relatively low, especially in physics learning. This is proven by the fact that students are still found playing truant during learning activities. They also often come in and out of the classroom during teaching and learning activities without clear reasons. The cause of students' lack of motivation to learn is due to problems being experienced by students. Apart from that, there are too many calculations applied in physics learning and the presentation of the material is less interesting. Physics learning is rarely integrated with situations or activities that students often carry out in their daily lives [6]. The teacher-centered learning process is also another reason that student motivation is reduced. This kind of learning process reduces students' self-confidence in solving problems, thereby hampering the development of students' thinking abilities and reducing students' learning motivation [7].

The world of education today continues to innovate in learning. The learning process provided by educators in the classroom must be integrated with technology. One example of technology that can be used in the learning process is multimedia. Multimedia is a computer system consisting of hardware and software that makes it easy to combine various components. Multimedia is a combination of several media such as text, images, video, and animation which are used to help convey information and can be controlled by users whether used online or offline [8]. The use of multimedia is an effective and appropriate alternative for improving and enhancing the modern learning climate both in the classroom and outside the classroom [9]. The use of interactive multimedia makes learning more interesting and more interactive. The use of multimedia in learning will increase efficiency, and motivation, and facilitate active learning and experimental learning. The use of multimedia can facilitate all learning styles such as audio, visual, and kinesthetic [10].

One type of interactive multimedia that can be used in the learning process is the multimedia learning module (MLM). A multimedia learning module (MLM) is a unity or combination of video, audio, text, narrative, and animation packaged in several forms [8]. MLM is an introductory medium that aims to motivate students to actively participate in learning activities.

Physics learning places more emphasis on contextual aspects. Many phenomena in physics are often found or experienced in everyday life. Good learning suggests linking learning concepts with everyday life phenomena so that the knowledge transfer process becomes more meaningful [11]. Meaningful learning can be realized by integrating local wisdom in its implementation [12]. A type of local wisdom that can be integrated into the learning process is the Banga Welu game. The Banga Welu game is a type of traditional game originating from Manggarai, East Nusa Tenggara region [13]. The ingredients used in this game are candlenuts. The Banga Welu game can explain a lot of physics, one of which is the concept of momentum, impulse, and collision. The application of local wisdom in learning activities can make learning conditions more enjoyable. This allows students to feel their experiences in everyday life closer to learning [14]. Learning based on local wisdom makes students more relaxed in learning and can foster students' intrinsic motivation.

It is important to develop multimedia learning modules (MLM) based on local wisdom. The Banga Welu game in physics learning is important. Learning using multimedia learning modules (MLM) based on the local wisdom of the Banga Welu game can enable students to understand the concepts of momentum and impulse contextually and directly. The advantages and disadvantages of developing multimedia learning modules (MLM) based on the local wisdom of the Banga Welu game are expected to help increase student learning motivation.

B. Method

This type of research is development research with a 4D design (Figure 1). This research was carried out at SMAK St. Francis Xavier Ruteng, NTT. The research subjects were 36 students. Analysis of product validity data uses ideal standard deviation (Sbi) and analysis of increased learning motivation uses the N-Gain test. Product validation uses 2 experts and media application trial design uses pretest-posttest control group design. The technique for collecting learning motivation data uses non-test instruments in the form of learning motivation questionnaires.

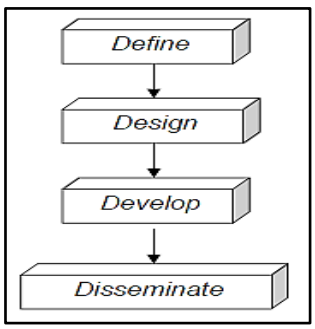

Figure 1. 4D Design

C. Result and Discussion

The product developed in this research is a multimedia learning module (MLM) based on the Banga Welu game. A multimedia learning module is a media used in the learning process with the Android system. Study materials, videos, animations, and example questions are found in this MLM. The materials, videos, and animations in this MLM are adapted to the local wisdom of the Banga Welu game. This media was developed using Adobe Animate software. The content in this media includes instructions for use, material on momentum and impulse, a video of the Banga Welu game, animation of the concept of momentum and impulse in the game of Banga Welu, example questions, and practice questions (Figure 2).

Figure 2. MLM display

This product assessment is carried out to determine the validity or feasibility of the MLM being developed. This product assessment was carried out by several assessors or validators consisting of media experts and material experts. The Banga Welu game-based MLM assessment includes 3 aspects, namely material, learning design, and language. The results of product assessments based on material aspects are analyzed using standard deviation assessment categories. The results of the feasibility assessment are shown in the following table.

Table 1. MLM Assessment Results by Material Experts

Aspect	Score	Category
Material	18.6	Very Feasible
Learning Design	22.6	Very Feasible
Language	3.8	Very Feasible
Overall	45	Very Feasible

Table 1 shows the results of the multimedia learning module (MLM) assessment analysis based on the Banga Welu game. The assessment results obtained are quantitative data with a score of 1 to 4. This data is then converted and analyzed using the standard deviation assessment category. The overall assessment of the Banga Welu game-based MLM product received a score of 45. Based on the results of the analysis and conversion to the standard deviation assessment category, it shows that this MLM is in a very suitable category for use. The assessment given by the validator is accompanied by suggestions for improvement, namely that the researcher needs to describe the material with a more straightforward definition the connection between local wisdom and the subject matter needs to be sharpened and the researcher must pay more attention to the use of more effective sentences. Meanwhile, the assessment of MLM based on the Banga Welu game based on media experts includes 2 aspects, namely the appearance aspect and the software engineering aspect. The assessment results are shown in the following table.

Table 2. MLM Assessment Results by Media Experts

Aspect	Score	Category
Display	22.4	Very Feasible
Software	7.2	Very Feasible
Overall	29.6	Very Feasible

Table 2 shows that the Banga Welu game-based MLM product in terms of media overall for all aspects received a score of 29.6. Based on the results of the analysis and conversion to the standard deviation assessment category, it shows that this MLM is in a very suitable category for use. The assessment given by the validator is accompanied by suggestions for improvement, namely the need to consider the consistency of the type and size of the letters, and the need to pay attention to the color of the media background.

Next is the trial stage which aims to see whether there is a difference in learning using the multimedia learning module based on the Banga Welu game on the learning implemented by teachers at school, especially regarding student learning motivation. Learning with different treatments for each class. Learning in the experimental class uses a multimedia learning module based on the Banga Welu game and learning in the control class uses no learning media.

To determine the increase in students' motivation to learn physics, two learning motivation questionnaires were given. The distribution of the initial questionnaire (pretest) was carried out to determine students' motivation to learn physics before participating in learning with the Banga Welu game-based MLM. Meanwhile, the administration or distribution of the second questionnaire (posttest) was carried out to find out students' motivation to learn physics after taking part in learning using

the Banga Welu game-based MLM. Knowing the initial and final scores of motivation to learn physics, it can be seen increase in students' motivation to learn physics after carrying out/participating in learning activities using the help of MLM based on the Banga Welu game. The results of students' physics learning motivation, both pretest and posttest, can be seen in the following table.

Table 3. Results of the Student Physics Learning Motivation

Class	Number of Students	Average Score of Learning Motivation	
		Pretest	Posttest
Experiment	36	74.4	93.2
Control	36	73.4	77.5

Table 3 shows the results of the student physics learning motivation questionnaire. Based on table 3 above, shows that the average student physics learning motivation for all classes in the pretest does not have too big a difference. This shows that students' initial motivation does not have much difference in participating in physics learning. After being given treatment in this case, the learning process increased learning motivation for all classes. The learning intended is learning with the help of MLM based on the Banga Welu game for experimental class 2. Learning using the help of PowerPoint media for experimental class 1 and learning without using the help of learning media in the control class.

Posttest results show that the average physics learning motivation of students in the experimental class is higher than the average physics learning motivation in the control class. This shows that the use of MLM assisted by the Banga Welu game in the learning process can increase students' motivation to learn physics. The N-Gain test was used to determine the increase in students' motivation to learn physics in the two sample classes as shown in the following table.

Table 4. Results of the N-Gain Test for Learning Motivation

Class	Average N-Gain	Category
Experiment	0.73	High
Control	0.15	Low

Based on table 4 above, shows that the N-Gain results of students' physics learning motivation in the experimental class are in the high category. Meanwhile, in the control class, the N-Gain results were in the low category. This shows that learning using the help of a multimedia learning module based on the Banga Welu game can increase students' motivation to learn physics. To see the N-Gain for each indicator of learning motivation, it is shown in Table 5.

Table 5. N-Gain for each Indicator of Students' Physics Learning Motivation

Class	N-Gain each indicator			
	Interest	**Attention**	**Participation**	**Doing Task**
Experiment	0.87	0.80	0.78	0.47
Control	0.32	0.06	0.15	0.08

The N-Gain results for each indicator show that the experimental class experienced better improvement than the control class with an average increase in the medium category. The indicator of doing assignments is one of the indicators with the lowest increase because some students still do not understand in detail the material being taught so that when doing assignments these students tend to be confused and unable to do it. This requires more intensive use of MLM so that students understand the material better and can do their assignments better.

The product developed in this research is multimedia learning modules (MLM) based on the Banga Welu game. This MLM is used in the learning process to increase students' motivation to learn physics. The study of the final product in the research focused on discussing the feasibility of MLM based on the Banga Welu game and the effectiveness of the Banga Welu game MLM in increasing student learning motivation. The multimedia learning module (MLM) based on the Banga Welu game that has been developed is a teaching material in the form of a multimedia module which is packaged in the form of an Android smartphone application by integrating the local wisdom of the Banga Welu game as a means of teaching physics concepts. The MLM based on the local wisdom of the Banga Welu game that was developed consists of a cover, login page, instructions for use, main menu, concept map, competencies, material content, examples, and practice questions. MLM content includes example questions, videos of the Banga Welu game, animations about the concept of momentum and impulse in the Banga Welu game, material concepts, and audio.

The feasibility of this Banga Welu game-based MLM was assessed based on an assessment of media, material, and trial aspects [15], [16]. Feasibility for media aspects and material aspects was assessed or validated by 2 experts (1 media expert and 1 material expert). The validation results show that MLM based on the Banga Welu game, in terms of material and media, is very suitable for testing. The revised MLM was then tested. Regarding learning motivation, the trial results show that the multimedia learning module based on the Banga Welu game is effective in increasing students' physics learning motivation. The multimedia learning module has a good impact on increasing the ability and motivation to learn physics. Multimedia learning modules are one solution for interactive physics learning modules that can be developed to fulfill technology-based physics learning [17]. The use of Multimedia learning modules is an effective and appropriate alternative to

improve and enhance the modern learning climate both in the classroom and outside the classroom [9]. The use of Multimedia learning modules can also improve the quality of student learning and can improve students' thinking abilities [18]. The use of Multimedia learning modules has a role in arousing curiosity in students. This makes students motivated to participate in the learning process [9]. MLM is an introductory medium that aims to motivate students to actively participate in learning activities. This MLM is packaged in several forms to reduce the ineffectiveness of using textbooks [19].

D. Conclusion

Based on the development results, analysis of research data, and discussion, it can be concluded that the results of the feasibility test show that the multimedia learning module of the Banga Welu game is suitable for use in the learning process. A multimedia learning module based on the Banga Welu game is effective in increasing students' motivation to learn physics. Apart from that, this product also helps teachers improve the quality of the learning process. This is because this product is integrated with technology. The multimedia learning module (MLM) product based on the Banga Welu game was declared feasible and effective for application in physics learning activities. The next stage of dissemination is to disseminate the product so that it can be innovated and developed in the field of education. The process of disseminating MLM products based on the Banga Welu game is carried out through Subject Teacher Deliberation (MGMP) forums, publications in journals, or educational seminars. Further development of MLM was carried out by developing similar products but based on local wisdom and different physical materials.

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