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DEVELOPMENT OF PETANQUE MARBLE GAMES IN PHYSICAL EDUCATION ACTIVITIES AT SMK ANTARTIKA 2 SIDOARJO

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Abstract: This study aims to develop Kelereng Petanque (Ketanque) as an alternative instructional medium for warm-up and cool-down activities in Physical Education (PJOK) classes at SMK Antartika 2 Sidoarjo. Ketanque is an innovative adaptation of two traditional games—marbles and petanque—designed to match the characteristics of adolescent learners and be easily implemented using simple equipment within the school environment. The research employed a Research and Development (R&D) approach using the ADDIE model (Analysis, Design, Development, Implementation, Evaluation). The developed product, consisting of a guidebook and instructional video, was validated by experts in content, media, and instructional design, and tested through small- and large-group trials. Validation results indicated that the learning media was categorized as "highly feasible", with average validation scores of 94% (media), 87% (content),). Field trials showed positive responses from students, with 88.20% in the small group and 83.90% in the large group expressing strong approval regarding the usefulness, ease of use, and engagement offered by the game. Furthermore, the game was found to significantly enhance student enthusiasm, social interaction, and motor skills in PJOK learning. It is concluded that Ketanque is an effective, innovative, and culturally rooted learning media alternative, capable of addressing the challenges of limited sports facilities and the monotony of conventional PJOK teaching approaches.

Keywords: Physical Education, traditional games, Kelereng Petanque, media development, ADDIE model

Abstrak: Penelitian ini bertujuan untuk mengembangkan permainan Kelereng Petanque (Ketanque) sebagai alternatif media pembelajaran dalam aktivitas pemanasan dan pendinginan pada mata pelajaran PJOK di SMK Antartika 2 Sidoarjo. Ketanque merupakan inovasi permainan tradisional hasil modifikasi dari permainan kelereng dan petanque yang dirancang agar sesuai dengan karakteristik peserta didik usia remaja, serta dapat dimainkan dengan sarana sederhana di lingkungan sekolah. Metode penelitian yang digunakan adalah Research and Development (R&D) dengan model ADDIE (Analysis, Design, Development, Implementation, Evaluation). Uji kelayakan dilakukan oleh ahli materi, ahli media, dan desain, serta diuji coba pada kelompok kecil dan besar. Uji coba menunjukkan respon positif dari peserta didik dan keseruan permainan, yang dinilai mampu meningkatkan motivasi, keterampilan motorik, serta pelestarian nilai-nilai budaya tradisional. Hasil validasi menunjukkan bahwa media pembelajaran Ketanque mendapatkan kategori "sangat layak" dari seluruh validator dengan rata-rata skor validasi sebesar 94% (media), 87% (materi), Uji coba menunjukkan bahwa sebanyak 88,2% siswa pada kelompok kecil dan 83.90% siswa pada kelompok besar memberikan respon sangat positif terhadap kebermanfaatan, kemudahan penggunaan, serta daya tarik permainan. Selain itu, permainan ini terbukti meningkatkan antusiasme, interaksi sosial, serta keterampilan motorik siswa dalam konteks pembelajaran PJOK. Dapat disimpulkan bahwa permainan Ketanque efektif dan layak digunakan sebagai alternatif media pembelajaran yang inovatif, menyenangkan, dan berbasis budaya, yang mampu

menjawab tantangan keterbatasan sarana olahraga serta kebosanan dalam pola pembelajaran PJOK konvensional.

Kata Kunci: PJOK, permainan tradisional, kelereng petanque, pengembangan media, ADDIE

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Introduction

In the PJOK learning process, the availability of sports facilities plays a very important role, especially for the smooth running of the teaching and learning process. PJOK is not only about learning, but also about physical activities that can make humans holistically healthy, both physically and spiritually. It also develops a good mentality, honesty, courage, sportsmanship, discipline, cooperation, and self-confidence. One sign that we are in good health is that we are free from illness and can carry out our daily activities without feeling tired. Not all schools are able to provide complete facilities and infrastructure for learning.

As a PJOK educator, one must be able to overcome all problems related to the limitations of existing sports equipment and facilities. Of the many well-known sports taught by teachers, such as soccer, basketball, athletics, and swimming, Few teachers introduce and provide material on traditional sports, many of which are already being played in competitions. In PJOK learning, it is not only modern sports that are taught, but also additional interesting and innovative games before entering into practical learning. This is so that students' interest in PJOK learning increases and they become more motivated.

Traditional games or sports can also be taught as additional games to open or close PJOK lessons. Educators in the 21st century must have unlimited skills and creativity in developing learning tools. Like other types of sports, traditional sports can be a medium to encourage individual participation in physical activities to achieve better health goals. In line with the characteristics of vocational high school students, aged 16-18 years, most of them still tend to like to play. For this reason, educators must be able to develop effective learning, while also understanding and paying attention to the characteristics and needs of students.

During this age, all aspects of human development, whether cognitive, psychomotor, or affective, undergo changes. The most noticeable changes are physical and psychological growth and development. Therefore, PJOK educators must be able to create effective and enjoyable learning experiences that are not monotonous. There needs to be an approach, variety, and modification in learning (Friyadi, 2023). In principle, traditional sports are types of games that involve physical activity. There are several benefits of physical activity, such as reducing the risk of diabetes, heart disease, hypertension, osteoporosis, and weight problems (Mahardikawati & Roosita, 2008). Gazali Cendra and Putra (2018) state that traditional sports are sports or games that have been passed down and developed in the community and have become a cultural tradition that must be preserved.

Traditional sports are a form of physical activity that is easy and inexpensive to do and provides a sense of joy/pleasure. In addition, traditional games, which come in various forms and variations, require different dominant physical abilities to play. Traditional sports games are increasingly being sidelined by modern games such as Play Station. The types of games

that are widely played by the current generation are digital-based electronic games (Cahya, Zakaria, and Kurnia 2022), such as online games (Anggita, 2019). As a result, games on gadgets are more popular than traditional sports.

This phenomenon needs attention, because if the younger generation is less interested in or even indifferent to traditional sports, there is a concern that these games unique to our nation will be lost to the passage of time. Through games, students can develop their physical skills because their need for movement is fulfilled, influencing their communication with their friends, developing their focus, and enhancing their creativity. Given this situation, educators have innovated by developing a learning activity that involves warm-up and cool-down exercises through the Development of Marble Petanque (Ketanque) Learning in Physical Education Activities at vocational high schools. This learning development is expected to stimulate interest and motivate students to preserve traditional sports that are on the verge of extinction.

Method

ADDIE Model Development Research Development research is a research approach that aims to design, test, and improve products so that they can be used effectively in a specific context. This research is very important for creating innovative products that are tailored to needs and can be applied in various fields, especially in education. In the context of education, development research is often used to produce learning tools, interactive media, and teaching methods that can support the achievement of learning objectives in a way that is not monotonous and is interesting. The development model used in this development research is the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) model. The ADDIE model is a development model that has systematic and simple stages. Each stage of the ADDIE model involves revisions, making the ADDIE model suitable for developing handout teaching materials to produce valid, practical, and effective products. The stages of the ADDIE development model adapted by Branch (2009:2) in this study are:

1. *Analyze* (Analisis)

   According to Branch, analysis involves identifying learning needs, objectives, and student characteristics. At this stage, needs analysis, objective analysis, and student characteristic analysis are carried out. The analysis used by researchers involves the ability to describe concepts and explain the interrelationships between the components contained therein. Analysis is also defined as a process of defining what students will learn. The main activity of the analysis stage in this study is to analyze the development of the Kelereng Petanque (Ketanque) learning model as an additional activity in warming up or cooling down before learning small ball material. The development of Kelereng Petanque (Ketanque) learning as an additional activity in warming up or cooling down before learning small ball material for students, especially grades XI and XII at SMK Antartika 2 Sidoarjo, led the researcher to make new innovations to increase students' interest and motivation in participating in PJOK learning, which tends to be monotonous.

2. *Design* (Desain)

Design is the second step in the ADDIE learning model. According to Branch, design involves planning learning strategies, materials, and evaluations. At this stage, instructional design, learning method selection, and material development are carried out. Design is a systematic process that begins with setting learning objectives, designing teaching and learning activities, designing learning tools, designing learning materials, and designing learning outcome evaluation tools. Efforts to design the learning process to be an effective and engaging activity are referred to as instructional system design (ISD). In this planning stage, researchers design the product to be developed. The following designs will be carried out: a. Designing and compiling the rules of the Ketanque game; b. Designing videos and guidebooks in accordance with the development of the Ketanque model.

3. *Development* (Pengembangan)

Development is the third step in implementing the ADDIE learning model. According to Branch, development involves developing learning materials, such as 26 modules, videos, or applications. At this stage, material development, testing, and revision are carried out. According to researchers, development is an important step in the trial phase before implementation. The development step includes activities such as creating, providing, and modifying teaching materials to achieve predetermined learning objectives. At this development stage, researchers search for and collect all reference sources to develop the content and objectives of the Kelereng Petanque (Ketanque) learning development as an additional activity in warming up or cooling down before teaching small ball material to students. In addition, a student response questionnaire instrument was tested on 30 students to determine the instrument's feasibility. Validity and reliability tests were conducted using Pearson Correlation in SPSS 26.

Student Response Questionnaire Validity Results

Statement No-	t_{count}	t_{table}	description
1	0,423	0.374	Valid
2	0,400	0.374	Valid
3	0,563	0.374	Valid
4	0,500	0.374	Valid
5	0,651	0.374	Valid
6	0,657	0.374	Valid

Statement No-	t_{count}	t_{table}	description
7	0,606	0.374	Valid
8	0,716	0.374	Valid
9	0,715	0.374	Valid
10	0,641	0.374	Valid
11	0,708	0.374	Valid
12	0,806	0.374	Valid
13	0,751	0.374	Valid
14	0,814	0.374	Valid

Each item in the student response questionnaire used is categorized as 14 valid statements and is suitable for use in collecting data for small group trials and large group trials. The reliability of 0.844> 0.6 indicates that the reliability of each item is high. The reliability results of the response questionnaire instrument have results of more than 0.6, indicating that the data produced is reliable for each item.

4. *Implementation* (Implementasi)

According to Branch, implementation is the process of learning using the developed materials. At this stage, implementation, training, and mentoring are carried out. According to researchers, implementation is the concrete step of applying the developed learning products. This means that at this stage, everything that has been developed in accordance with its role and function can be implemented. This implementation stage is carried out by testing the media directly through learning. The implementation stage in this study was carried out in grades XI and XII with a total of 82 students, by testing the results of the Kelereng Petanque (Ketanque) learning product as an additional activity in warming up or cooling down before learning small ball material for students. This trial activity was carried out to collect data on the practicality, validity, and feasibility of the model developed by the researcher, which can be used as material in Kelereng Petanque (Ketanque) learning as an additional activity in warming up or cooling down before learning small ball material. In developing the Kelereng Petanque model, subject matter experts and media experts are needed.

5. *Evaluation* (Evaluasi)

The evaluation stage in ADDIE model development research is the fifth stage. According to Branch, evaluation is the assessment of the learning process and materials that have been developed. At this stage, evaluation, analysis of results, and improvements are carried out.

Results and Discussion

Results

Instrument validation in this study involved three experts in the field of PJOK learning, subject matter experts, media experts, and small and large group trials. Instrument validation was conducted to determine the extent to which the instruments developed were suitable for use in SMK PJOK learning.

Results of Expert Material Assessment, Media Expert Assessment, and Small-Scale Testing of Large Groups

No	Validator	Subjek Try	Percentage	Validation Criteria
1	Subject Matter Expert	1 Lecturer	87 %	Very Good
2	Media Expert	1 Lecturer	94 %	Very Good
3	Small Group Trial	32 Students	88,20 %	Very Good
4	Large group trial	50 Students	83,90 %	Very Good

The assessment results provided by the material development experts obtained an average score of 87% for the material assessment component and the material questionnaire component of the game development model, which is “Very Good”. The assessment results provided by the media experts for the above development model obtained an average score for the media assessment component and the media questionnaire component of the development model, which is “Very Good” with an average score of 94%. From the results of the small group test, where a sample of 32 students became the value or average obtained for the design components of the Kelereng Petanque (Ketanque) game development model, the average score was 88.2% Very Good. From the results of the large group test, where the sample consisted of 50 students, the average score obtained for the design components of the Kelereng Petanque (Ketanque) game development model was 83.90% “Very Good”, based on the following formula calculation.

$$\boldsymbol{P = \frac{F}{n} \times 100\ \%}$$

Discussion

The research is linked to relevant theories and the practical context of physical education learning in schools. The discussion focuses on three main aspects, namely (1) media

feasibility based on expert validation, (2) student responses through 82 small and large group trials. Product Feasibility Based on Expert Validation The Ketanque learning media was rated "very feasible" by subject matter experts (score of 87%) and media experts (score of 94%). This assessment shows that the developed product has met the basic principles of effective learning media development. According to Heinich et al. (2002), good learning media must fulfill the aspects of content suitability, clarity of delivery, media integration, and effectiveness of use in learning. The experts' assessment supports this statement, particularly regarding the clarity of the learning sequence, the relevance of the material to basic competencies, and the communicative aesthetics of the media. The suitability of the game to the learning objectives of PJOK, especially in small ball material, also shows that modifying traditional games such as Ketanque can be an innovative solution in presenting contextual learning. This is in line with Trianto's (2010) view that activity-based and local culture-based learning can increase student interest and participation and bring learning material closer to their real experiences.

Positive Response of Students to Media The response of students in the small group trial (88.20%) and large group trial (83.90%) shows that Ketanque media is very popular and accepted by students. This confirms that students respond positively to the media in terms of its use, visual design, and benefits in learning. In terms of media usage, students felt that the instructions were easy to understand, the language was communicative, and the game tools were not complicated. This shows that the principle of usability in media development has been achieved (Nieveen, 1999). This means that students can access, understand, and use the media without excessive cognitive load. From the aspect of visual communication, the media was considered quite attractive, although there were suggestions for improving the appeal of the design. This indicates the importance of considering graphic design and color psychology in learning media (Mayer, 2001), because visual elements also influence student motivation and engagement. Meanwhile, from a learning perspective, this game has been proven to increase student motivation, engagement, and understanding of the material. This is in line with Vygotsky's constructivist learning theory, which emphasizes the importance of social interaction and meaningful activities in the learning process. Through games, students not only understand concepts but also internalize the values of cooperation, sportsmanship, and responsibility.

Research Implications The results of this study provide several important implications, including: For physical education teachers, this game is an innovative alternative for designing learning activities that are fun and still educational. For schools, this product is relevant for schools with limited sports facilities because it only requires simple media. For curriculum developers and researchers, these findings reinforce the urgency of integrating local culture and activity-based approaches in the development of learning media. Limitations and Recommendations Although the results of this study show that Ketanque media is very feasible and effective, there are several important notes for future development: Visual media needs to be improved in terms of aesthetics to make it more visually appealing, especially in terms of background design, colors, and game graphics. Digital documentation (applications or online interactives) needs to be developed to reach schools that implement blended learning.

Conclusion

The Kelereng Petanque (Ketanque) game learning media is very suitable for use in PJOK learning activities in vocational schools, especially in warm-up or cool-down activities in small ball material. This is proven by the results of validation by material experts with a suitability score of 87% and by media experts with a score of 94%, both of which are in the "very suitable" category. The Ketanque game has been proven to be effective in increasing student engagement and interest in learning, as well as creating a more enjoyable and interactive learning atmosphere. In small group trials with 32 students and large group trials with 50 students, the average feasibility scores were 88.20% and 83.90%, respectively, indicating a very positive response from students to this learning media. The simple, creative, and contextual game design is Ketanque's main strength as a learning medium. The use of easily available tools, clear instructions, and active student involvement in the game make this medium very suitable for implementation in schools with limited sports facilities.

The Ketanque game not only trains students' motor skills and concentration, but also indirectly instills character values such as sportsmanship, cooperation, responsibility, and concern for local culture. This is in line with the Merdeka Belajar principle, which emphasizes meaningful, contextual, and character-based learning. Implementation in the field shows that this medium can be an innovative solution for physical education teachers to overcome student boredom in learning, as well as an alternative icebreaker or educational closing activity. The enthusiasm of students during implementation and the ease with which teachers can apply it show that Ketanque has the potential to be adapted more widely.

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