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RESEARCH ARTICLE

Validity of a Game-Based Learning Model for Teaching Floor Exercise Roll Basic Techniques to Junior High School Students in Indonesia

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Abstract
The goal of this instructional style is to help students become more proficient at the floor exercise roll by using a game-based approach and other forms of media. The purpose of this research is to provide evidence for the efficacy of a model for teaching the fundamentals of the floor exercise roll through the medium of a video game in junior high school. Three subject matter experts and three media specialists evaluated the research and validated the learning model using a set of established criteria. This study is occurring within the product development phase with ten stage. A questionnaire was utilised to obtain data for determining the model's accuracy. Descriptive percentages were used to assess the data. The average model validity ratings found in this research show that the material expert validator is 83.33 percent valid and the media expert validator is 89.4 percent valid. The validity score generated by the combination of the three validators is very high quality. Consequently, it is reasonable to infer that the floor exercise roll basic technique learning model based on a game is genuine and can be applied in the context of school-based sports education. Sports educators and curriculum designers can use the favourable feedback from material and media experts to inform the design of more effective learning models for students to become proficient in floor exercises and fundamental rolling technique.

Keywords
Roll Basic Technique; Learning Model; Floor Exercises; Game Based Learning

INTRODUCTION

Education is an important factor in building the character and potential of students (Messias, 2023). In the context of physical education, basic techniques need to be well mastered by students to achieve optimal performance in various sports activities. However, conventional learning methods are often considered boring and unattractive to students (Lubis et al., 2022), which can reduce their motivation and interest in learning (Cereda, 2023).

One interesting approach to increase student interest and motivation is to use a game-based learning model. In this context, the basic technique of learning through the game "Floor Exercise Roll" has been developed as an interesting alternative. This game involves physical movements centered on basic techniques that must be carried out by students through various challenges and scenarios in the form of a game.

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However, despite the promise of this game-based learning approach, it is important to evaluate the validity of this learning model before it is widely implemented in educational contexts. The validity of the learning model refers to the effectiveness and suitability of the learning method in achieving the desired learning objectives.

Physical education is not only aimed at developing the physical realm, but also can develop health, physical fitness, the ability to think positively, and the ability to apply a healthy lifestyle (Sinag, 2023). In the field of physical education, the government echoes the banner of sports, namely "to promote sports and get people to do sports", in this regard, the interest and desire of the community to do sports is increasing day by day. The government has been giving attention and instruction that we must maintain and get used to living healthy and fit in fostering health both in physical and spiritual factors.

Children's health and well-being depend on the skills they learn in physical education classes, which are an essential aspect of a well-rounded education. With the help of sports and other physical activities, PE teachers hope to foster their students' mental and physical well-being, as well as their capacity to think critically, manage their emotions, get along with others, use logic, and act morally. Sports training In this context, educators are tasked with instilling a healthy habitual lifestyle, instilling values (sportsmanship, honesty, cooperation, etc.), and instructing students in a variety of fundamental motor skills, games, and sports tactics and strategies (Culajara, 2023a). Physical, mental, intellectual, emotional, and social components complement the more traditional, theoretical approach to education. Putting a didactic-methodological spin on the activities you assign in the classroom is essential if you want your students to learn.

The role of the educator cannot be disentangled from the outcomes of students' learning in the areas of physical education, sports, and health. Educators must to have the wherewithal to develop lessons that make use of effective practises and procedures. Teachers should tailor their techniques and methods to the unique needs of a predominantly female student body and institutional context. Teachers in the fields of physical education, sports, and health should be able to foster a positive classroom environment that encourages active participation and allows students to readily absorb the offered material (Culajara, 2023a). The goal of assessment is to improve the efficacy of the learning procedure and, by extension, the results of that procedure (Sinag, 2023).

The school in Indonesia is equipped to teach a variety of topics from the 2013 curriculum. The curriculum for 2013 places the emphasis on the learner, which in turn generates challenges that encourage pupils to use their imagination. Floor exercises are a topic covered in the 2013 version of the national standards for physical education. Analysing a sequence of simple motions in targeted floor exercises for indications of fundamental competence and skill level (3.6) The results of the analysis are consistent with the sports and health physical education teacher's book, which includes forwards roll, straddle jump, and squat jump as examples of floor exercises that require the practise of a combination of skills in the form of a series of simple movements in specific activities. The 2013 middle school curriculum includes these topics.

Gymnastics is a very popular sport in Indonesia and is part of the physical education curriculum at schools. Therefore, it is necessary to conduct research to evaluate the learning model used in teaching the gymnastics roll basic technique to junior high school students. An effective learning model should pay attention to the characteristics of students, including their interests and needs, and use interesting and interactive methods to increase student participation and involvement in learning (Suhairi et al., 2022; Syauqye, 2020).

Modern competitive sports aerobics evolved from a combination of general developmental, dance exercises with a focus on health, and elements and adaptations from other complex coordination sports like gymnastics, acrobatics, and others. Many difficult gymnastic components are included in the sport's competition rules, thus athletes need to prepare for them. It's also important to remember that some sports aerobics athletes enter the collegiate realm with minimal background in dance or other sports and a focus only on academics. For this reason, research into how sports aerobics help women get ready for gymnastics is important (Plomp, 2013).

More effort is being put into the many applications of digital game-based learning (DGBL), or the use of video games as a teaching

tool (Culajara, 2023b). Given the current state of affairs, it seems likely that distant learning and ad hoc self-study will become the standard for a while. The requirement to identify the games that produce the desired educational outcomes becomes more pressing as a result. Recent research into the usefulness of DGBL across disciplines has yielded conflicting conclusions (Kravchuk et al, 2020; Gorbanev et al, 2018; Hussein et al, 2019; Zhonggen, 2019).

The study of Setiawan et al (2022) explained the results of their research which showed that learning media provided a very dominant role in conveying a material in accordance with teaching materials. They hoped that this learning model could be used as an alternative in teaching floor exercise roll basic technique to students in schools.

Teaching gymnastics in the classroom can help kids get in shape and stay healthy (Spera, 2022). Similarly, "Gymnastics requires explosive, balanced, and artistic skills, and includes movements with high levels of intensity and difficulty," as described by Edouard et al. Gymnastics has a high intensity and difficulty level in movement due to the need for quick movements, balance, and artistic qualities (Edouard et al, 2018). In addition, floor exercise can also be used as a tool to train physical abilities such as speed, agility, balance, endurance, and strength, as well as to train courage and confidence. Since students start out at widely varying levels of proficiency with respect to the forwards and backwards roll basic technique in floor exercises, it stands to reason that a lack of variety in the teaching methods available to them would have a negative impact on their ability to grasp the material and their motivation to study it. So, children will get bored with forwards and backwards rolls as part of their floor exercises.

Until now, research on the validity of the "Floor Exercise Roll" game-based basic technique learning model for junior high school students is still limited. Therefore, there are several research gaps that can be explored, including: 1) Learning Validity: It is important to identify the extent to which this learning model can improve students' understanding and mastery of the basic techniques being taught. Can this game-based learning improve students' motor skills, strengthen understanding of concepts, and increase their learning motivation?; 2) Learning Effectiveness: How effective is this learning model in facilitating student learning? Can the "Floor Exercise Roll" game produce more effective learning compared to conventional learning methods? Is there a significant difference in learning achievement between groups of students who use game-based learning models and groups of students who use conventional methods?; 3) Student Acceptance and Satisfaction: How are students' perceptions of using this game-based learning model? Do students feel involved and interested in this lesson? Are they satisfied with the learning experience provided by the "Floor Exercise Roll" game?

Research on the validity of the game-based basic technique learning model "Floor Exercise Roll" for junior high school students in Indonesia has an important urgency in the educational context, for the following reasons: 1) Increasing Interest and Motivation in Learning: Game-based learning models have the potential to increase student interest and motivation in Study. By evaluating the validity of this model, we can understand whether the "Floor Exercise Roll" game can be an effective tool in arousing students' interest in learning basic techniques; 2) Development of Innovative Learning Methods: This research can provide an empirical basis for the development of innovative learning methods that involve aspects of play. By validating this learning model, educators and policy makers can consider its use in improving the quality of learning basic techniques in schools; 3) Improving the Quality of Physical Education: The validity of this learning model can contribute to improving the quality of physical education at the junior high school level. By providing an interesting and effective learning approach, students can develop better motor skills and conceptual understanding, which in turn will have a positive impact on their performance in sports activities; 3) Through research on the validity of the "Floor Exercise Roll" game-based basic technique learning model for junior high school students, we can gain a better understanding of the potential and effectiveness of this model in improving basic technique learning. This can contribute to the development of better education and strengthen commitment to learning innovation in the field of physical education.

In addition, this study also pays attention to learning theories which state that fun learning can increase students' motivation and interest in learning, as well as improve their learning

outcomes. Thus, the development of this learning model provides added value in increasing the effectiveness and efficiency of learning. This research also contributes to the field of floor exercise learning, especially the roll basic technique. In the world of sports, the floor exercise roll basic technique is a very important and fundamental technique for students to be able to master advanced techniques.

The purpose of this research is to test the validity of the learning model developed based on learning theories and practical experiences in the field. This study aims to prove that the developed learning model can improve student learning outcomes in learning the floor exercise roll basic technique.

MATERIALS AND METHODS

Data Collection Tools

This assessment is qualitative and judgmental, and is carried out by a panel of experts, not by the item writer or the designer of the learning model itself. This is the procedure that produces logical validity. The research subjects were the 8th-grade students of senior high school in Cirebon, West Java, Indonesia. Ethical clearance (No. 71/LPPM-UNTAG/IX/2022) for this research was obtained from the Research Ethics Commission of Universitas 17 Agustus 1945 Cirebon, Indonesia. The methodology employed is the development research model (Edouard et al, 2018; Yudha et al, 2019; Plomp, 2013), which includes ten stages:

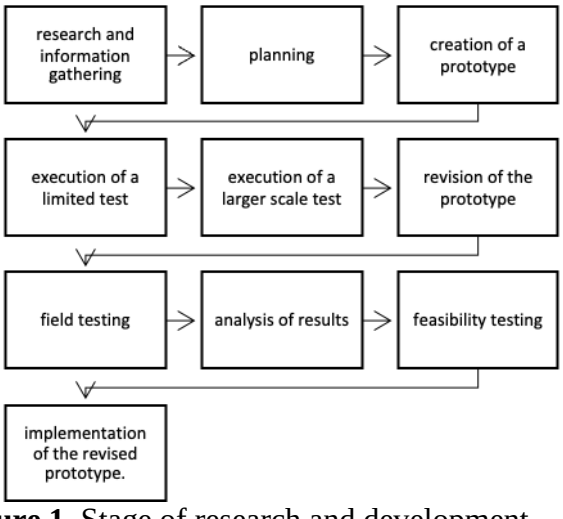

Figure 1. Stage of research and development

The data collection technique used is observation by experts using questionnaire. The number of participants or experts who made observations were three content experts and three media experts. This validation includes: first, proof related to content, and construct validation. Content validity analysis was carried out by analyzing the results of content validation by experts using descriptive statistics.

The product produced in this research is a learning module. This module contains steps for learning basic techniques using the Floor Exercise Roll model. Modules will be developed based on relevant research and relevant learning guides. Modules will include instructions, exercises, and challenges involving the use of the Floor Exercise Roll game. For the purpose of assessing student work, this rubric details the standards that educators have set to evaluate the application of their model to teach basic roll practice skills through play at the intermediate level. The evaluation rubric determines what qualities should be present in student work and how they should be evaluated. The goal of developing an assessment guide is to ensure that anyone using the end product has a solid understanding of the pedagogical principles by which student play-based rotational exercises will be evaluated. Scores from 1 to 4 are converted into qualitative information in the validation criteria table using a Likert scale. The rubric suggestion column is available for you to fill in with any further thoughts you may have about whether the product being assessed is appropriate or not.

The learning model is tested for item content validity and content validity, first asking the assessor (rater) for the suitability of the grid with the test items that were successfully derived from the grid. Until now, many ways have been taken by constructors of learning achievement tests in a field of study in terms of asking the rater for an assessment. There are learning outcomes tests assessed by two raters, and there are also those assessed by a group of experts called Subject Matter Experts (SME). The expert panel consists of people who have expertise in the instrument to be assessed. As a guideline, at least a panel of experts consists of 6 people who have expertise in terms of the content and media to be assessed. From the results of the assessment of the 6 panel of experts, the content validity of the items and the product content validity will be determined. It is

estimated and can be quantified and the statistics are indicators of item content validity and test content validity. The content validity of the items can be demonstrated, among others, by the CVR statistics from Lawshe and the V statistics from Aiken. While the content validity of the test can be shown by CVI statistic from Lawshe Learning model validation criteria (Table 1 and Table 2).

Table 1. Criteria for the validity

Score	Validity Category	Description
40-48	Highly Valid	Recommended to be used
31-39	Valid	Can be used with minor revision
22-30	Quite Valid	Can be used with major revision
12-21	Invalid	Can be used with major revision

Source: (S. Akbar, 2013).

Table 2. Achievement benchmark reference assessment conversion

Achievement (%)	Validity Category	Description
76-100	Excellent	No need to revise
56-75	Good	No need to revise
40-55	Fair	Can be used with major revision
0-39	Bad	Can be used with major revision

Statistical analysis

The statistical analysis was conducted using SPSS v26.0 for Windows (SPSS Inc., Chicago, USA) to calculate the percentage of the validation test results questionnaire.

RESULTS

The validation of the game-based floor exercise roll basic technique learning model for junior high school students began with the development stage, namely designing a game-based floor exercise roll basic technique learning model for junior school students, which was then logically validated by 3 expert lecturers.

Table 3. Material expert validation results

Aspect	Indicator	Validator			Average
		1	2	3	
Image Concept	The suitability between the pictures and the learning objectives	4	4	3	3.67
	Material Depth	3	3	3	3.00
	Validity of content/concept	3	3	3	3.00
	The accuracy of picture selection to explain the material	4	4	4	4.00
Image Understanding	Pictures can make it easier to remember and understand the material	3	3	3	3.00
	Accurate emphasis on certain parts of the image	4	3	3	4.33
Image Integration	Pictures and captions are synergistic and mutually supportive	4	3	3	4.33
	The material is presented in an orderly manner	4	3	4	3.67
Materials Delivery	The material is presented simply	3	3	3	3.00
	Clarity of material description	4	3	3	4.33
	Total	36	32	32	
	All Item/Validator	Valid	Valid	Valid	No need
	Average		33.33		to revise
	Percentage		83.33%		

Table 4. Media expert validation results

Aspect	Indicator	Validator			Average
		1	2	3	
Color Display	Color selection accuracy	4	4	4	4.00
	Text color compatibility	3	4	3	3.33
	Color selection attractiveness	4	4	3	3.70
Image Display	Image size accuracy	4	4	4	4.00
	Image clarity	4	3	4	3.70
	Interesting picture	3	3	3	3.00
Material Concept Display	Image media size	4	3	3	3.33
	Image relevance to the material	3	4	4	3.70
Layout Display	Real pictures according to the concept	3	3	3	3.00
	Image placement	4	4	3	3.70
	The accuracy of the caption position	4	4	4	4.00
Caption Display	Font selection accuracy	3	4	3	3.33
	Appropriate font type and size	4	3	3	3.33
	Font size consistency	4	4	4	4.00
	Easy-to-read font type and size	4	3	4	3.70
	Total	55	54	52	
	All Item/Validator	Valid	Valid	Valid	No need to revise
	Average	53.67			
	Percentage	89.4%			

Table 5. Material Expert Improvements and Suggestions

Suggestion	Revision
Fix the learning objectives to be more operational	The learning objectives have been changed and adapted to the floor exercise roll material
The background and objectives of developing the learning model are not yet clear	More context and goals for the learning model's creation are laid forth; specifically, the goal is to create a learning model in which students take an active role as individuals and in small groups, and are not afraid to voice their opinions or put them into practise in their daily lives.
The learning theory that underlies the developed learning model needs to be added.	The produced learning model guide provides an explanation of the underlying learning theory at each level of the development process.
The learning model support system developed needs to be clarified.	A key component of the learning model support system is the availability of sufficient reading material for each student; in addition, the learning resources available in the school environment are highly helpful.

Table 6. Media Expert Improvements and Suggestions

Suggestion	Revision
The placement of image captions is less effective	Captions for pictures have been replaced and placed under the pictures in sequence.
Give an arrow as an initial explanation of movement/foot movement or something else	Each picture has been given an arrow to indicate the direction of movement and the next movement.
Neat lettering	The Font / Letter arrangement has been corrected to be aligned to the right and left (Justify).
Explanatory sentences are below the image captions	The explanatory sentence has been changed and tidied up according to the advice of media experts

Since the beginning of the development of a game-based floor, exercise roll basic technique learning model for junior high school students, a lot of input has been received, so it continues to be improved, starting from the name of the learning model to the characteristic elements of the learning model. The validator expert results of the material experts and media experts can be seen in Table 3 and Table 4. The validation results with material experts on the game-based floor exercise roll basic technique learning model for junior high school students have an achievement level of "83.33%"

and are included in the "Excellent" category. The assessment consists of 4 aspects which include the image concept aspect, the image understanding aspect, the image integration aspect, and the material delivery aspect.

The results of the validation process with media experts from the display aspect use a scale of 1 to 4. Meanwhile, suggestions and input from material experts are used to improve the quality of the image media being developed. Then, to provide meaning and decision-making, the benchmark reference assessment conversion level of achievement with a scale of 4 was used. Data from the validation results of stage 1 media experts regarding the quality of media image display can be seen in the table 3.

The validation results with media experts on the game-based floor exercise roll basic technique learning model for junior high school students have an achievement level of "89.4%" and are included in the "Excellent" category. The assessment consists of 5 aspects which include the color display aspect, the image display aspect, the material concept display aspect, the layout display aspect, and the caption aspect. The results of the scores above by each validator were given the decision that the game-based floor exercise basic roll technique learning model for junior high school students can be used in learning with minor revision.

This revision, especially in the statement items that explain the material depth, the validity of the content/concept, pictures can make it easier to remember and understand the material, and the material is presented simply are considered less valid because it obtained an average of 3.00 from the three validators. The purpose of developing a learning model is also more specific with instructional impact. Input from the validator is used as the basis for revising the feasibility of the learning model. Revisions that have been made can be seen in Table 5 and Table 6.

DISCUSSION

This research is development research that aims to develop a learning model and determine the feasibility of the learning model. This research is providing solutions to research problems that have been described in the background section, in which the problem is the lack of willingness and understanding of students in learning which affects student learning outcomes. However, the model that we use should always be adapted to the material to be delivered, the characteristics of the students who are targeted, and the level of effectiveness and efficiency, so that the learning model can have a positive impact on the learning process to achieve learning objectives.

Sports training incorporates the unique physical and cognitive capacities of each student; sport-specific motor skills and in-depth sports knowledge are taught in specialized classes; and the more competitive nature of sports in sectional classes motivates students to participate in physical activity outside of class. How physical education is structured during childhood and adolescence has a profound impact on whether or not a person develops a lifelong passion for sports (Zakharina, 2022).

The floor exercise roll basic technique is one of the important movements in floor exercises that must be mastered by students. However, many students have difficulty in mastering this basic technique. Therefore, an effective and interesting learning model needs to be developed so that students can understand more easily and master the floor exercise roll basic technique (Akbar, 2013).

One of the research articles related to this topic is "The Effect of the Direct Instruction Learning Model on Learning Outcomes of the Floor Exercise Forward Roll Basic Technique" by Mabrur et al., (2021). This study resulted in findings that the game-based learning model can improve student learning outcomes in mastering the forward roll basic technique.

Furthermore, Tri Puryadi et al., (2022) developed a game-based floor exercise roll basic technique learning model for junior high school students. They tested the validity of the developed instrument using previously validated assessment instruments. The results of the study stated that the developed instrument was constructively valid because it was able to explain the overall variations in the forward roll material.

The game-based approach in this learning model is based on cognitive and psychomotor learning theory. The learning model consists of three stages, namely the preparation stage, the implementation stage, and the assessment stage. The preparation stage includes learning the basic theory of floor exercise rolls, an explanation of the game, and an introduction to the instruments used. The implementation stage includes a simulation

game that allows students to practice the floor exercise roll basic technique in a structured manner. The assessment phase includes individual and group assessments of students' abilities in performing the floor exercise roll basic technique (Pickard, 2017).

The results of the study show that the game-based floor exercise roll basic technique learning model is considered valid from the perspective of material experts and media experts. Material experts give an excellent assessment of the validity of the learning model, especially in terms of suitability with the material and sports learning. Media experts also give an excellent assessment of aspects of the design and use of media in learning models.

There is evidence that shows that game-based learning can be more effective than standard teaching methods. In addition, the immediate nature of the feedback it provides might make learning more engaging and difficult (All et al, 2021). When students work together on a project or study group, they form a cohesive learning community in which they support and learn from one another (Davidson et al, 2021). As a result, students are better able to contribute to their own education. Students' professional development and self-awareness are boosted, and they are immersed in real-world learning scenarios while using games as a teaching tool. Students, therefore, construct their own cognitive structures and schemes in accordance with the same methods for thinking and problem-solving in games through their active engagement in the learning process (Huang, 2012).

The use of game-based learning models for teaching floor exercise roll basic techniques to junior high school students in Indonesia is a topic of growing interest. Several studies have explored the effectiveness of game-based learning models in enhancing learning outcomes and instilling character values among students in Indonesia. For instance, Budiwan et al. (2020) conducted a study to test the validity of the Family Supported Collaborative Learning (FSCL) model in instilling character values to junior high school students in Ponorogo, Indonesia (Budiwan et al., 2020).

The findings of this study could provide insights into the potential effectiveness of game-based learning models in promoting character development among junior high school students. Furthermore, Triwijaya (2024) demonstrated that learning front roll floor exercises through a game model can improve student learning outcomes (Triwijaya, 2024). This suggests that game-based approaches have the potential to enhance students' skills and performance in physical education, including floor exercises. Additionally, the research by Fujiya & Asyidiq (2022) focused on the use of the Kahoot! game in Islamic junior high schools in Yogyakarta, highlighting the enthusiasm and engagement of students when using game-based learning tools (Fujiya & Asyidiq, 2022). This indicates the potential for game-based learning models to create a more engaging and effective learning environment for junior high school students in Indonesia. Moreover, Molina et al. (2019) emphasized the importance of task planning for sports learning, indicating that traditional teaching-learning models may not effectively promote tactical learning and decision-making skills among students (Molina et al., 2019). This underscores the potential benefits of incorporating game-based approaches to enhance students' understanding of tactical aspects in sports, including floor exercises.

In conclusion, the references provide valuable insights into the potential validity and effectiveness of game-based learning models for teaching floor exercise roll basic techniques to junior high school students in Indonesia. These studies highlight the positive impact of game-based approaches on learning outcomes, student engagement, and character development, suggesting the potential of such models to enhance the overall learning experience for junior high school students.

Conclusion

The floor exercise roll basic technique learning model based on a game is genuine and can be applied in the context of school-based sports education. Sports educators and curriculum designers can use the favourable feedback from material and media experts to inform the design of more effective learning models for students to become proficient in floor exercises and fundamental rolling technique.

Conflict of interest

The authors declare no conflict of interest. No financial support was received.

Ethics Statement

Ethical clearance (No. 71/LPPM-UNTAG/IX/2022) for this research was obtained

from the Research Ethics Commission of Universitas 17 Agustus 1945 Cirebon, Indonesia.

Author Contributions

Study Design, SS and AH; Data Collection, SS and HNP; Statistical Analysis, NFS and RP; Data Interpretation, S, HNP and WAN; Manuscript Preparation, SS and RP; Literature Search, SS and rp. All authors have read and agreed to the published version of the manuscript.

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