Bravo's: Journal of Physical Education and Sport Science
Volume 14 Issue 1, March 2026, pp: 39-57
E-ISSN: 2597-677X; P-ISSN: 2337-7674
DOI: http://dx.doi.org/10.32682/bravos.v14i1/180

Development of learning media for shot put modification from ironwood material for physical education, sports, and health learning

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Abstract

The objective of this study is to development of learning media for shot put modification from ironwood material for physical education, sports, and health learning at SMKN 1 Kota Besi. The research and development model follows the ADDIE procedure. Product testing will determine the feasibility of the developed product. Data is collected through observation and questionnaires for expert evaluations of learning, media, and practitioners. Data is also collected through small and large group testing and student assessments from tenth grade students at SMKN 1 Cempaga, SMKN 1 Kota Besi, and SMKN 2 Sampit. Quantitative descriptive statistical analysis is used for data analysis techniques. Based on the results of the analysis, learning experts scored 94%, media experts scored 96%, and practitioner experts scored 80%. The small-group trial at SMKN 1 Kota Besi showed a percentage of 90%, while the large-group trials at SMKN 1 Cempaga, SMKN 1 Kota Besi, and SMKN 2 Sampit showed percentages of 94%, 85%, and 76%, respectively. A comprehensive analysis of the research results shows that the development of modified shot put learning media made from ironwood for use in physical education, sports, and health education, particularly for class X students at SMKN 1 Kota Besi, is practical and feasible. This conclusion is based on the results observed when applying physical education, sports, and health teaching materials for shot put athletics.

Keywords: physical education; learning media; shot put modification; ironwood.

Received: 12 09 2025 Revised: 03 12 2025 Accepted: 12 03 2026

Authors' Contribution: A – Conceptualization; B – Methodology; C – Software; D – Validation; E - Formal analysis; F – Investigation; G – Resources; H - Data Curation; I - Writing - Original Draft; J - Writing - Review & Editing; K – Visualization; L – Supervision; M - Project administration; N - Funding acquisition

INTRODUCTION

Physical education learning exists at all levels of education in Indonesia from elementary school, junior high school, to high school. In its learning, it has the aim of fostering the quality of knowledge and skills of students as a whole for the present or future, as well as increasing the physical fitness of each student. One of the significant tasks experienced by every educational institution is to provide useful knowledge and learning for each student. Learning is a science given by an educator to his students with the aim of improving and broadening the students' horizons in certain sciences. Learning is an activity that utilizes sources to gain knowledge and positive values in it (Rohani, 2019). Learning objectives are a student learning process which has been designed and arranged as well as possible so that the learning runs well and effectively.

Teachers play a very important role in the implementation of the physical education, sports, and health learning process. In research Iswanto, (2021) explains that physical education learning to get the desired and quality results really needs some media and the right learning design. The physical education teacher is the first person in the learning implementation process who is required to prepare both physical strength, mentality, emotional, discipline, creative, and innovative in the implementation of learning. This is also reinforced by research Wiguno et al., (2024) which explains that the delivery of material by an educator or trainer in the implementation of learning assisted by learning media will be able to create positive conditions, including fun things and increase student motivation.

In the learning outcomes of the independent curriculum, it is emphasized on the skill element through games and sports, one of the sports taught at school is the athletic shot put. Athletics is one of the sports in which there are various race numbers from walking, running, jumping to throwing. The shot put itself is included in the competition number of the athletic sport where the shot put is pushed with one of the strongest hands to reach the farthest repulsion. According to Purnomo & Dapan, (2011) the shot put is part of the throwing number where this number is not thrown but rejected or pushed from the shoulder with one hand. The purpose of learning to throw shot put itself is to equip each student about the theory and practice of basic techniques in learning physical education, sports, and health athletic material.

The results of the needs analysis were based on observations and questionnaires given to physical education, sports, and health teachers, as well as class X students at SMKN 1 Cempaga, SMKN 1 Kota Besi, and SMKN 2 Sampit. The lack of sports equipment is clearly demonstrated by the fact that the physical education, sports, and health teacher must borrow equipment to stop the shot put event at PASI Kotawaringin Timur. In the implementation of learning, physical education, sports, and health teachers only teach material that involves thinking. In physical education, sports, and health classes, there are three parts to learning: thinking about what you are doing, feeling what you are doing, and doing the actions. This is clear from the results of the needs analysis of the physical education, sports, and health teacher at SMKN 1 Cempaga. In this analysis, the equipment is available 83% of the time. The teacher understands the material 50% of the time, and the learning process is 80% of the time. The total percentage is 75%. You can also see this from the results of a needs analysis of physical education, sports, and health teachers at SMKN 1 Kota Besi. In that analysis, the equipment was available 83% of the time. The teachers understood the material 75% of the time, and the learning process was 90% for a total of 85%. You can also see this from the results of a needs analysis of physical education, sports, and health teachers at SMKN 2 Sampit. In this analysis,

the equipment was available 83% of the time. The teachers understood the material 75% of the time, and the learning process was 90% for a total of 85%. Researchers not only looked at what physical education, sports, and health teachers need, but also what students need. This is clear from the results of a needs analysis of class X students at SMKN 1 Cempaga. The analysis looked at how much equipment was available (72%), how much material was understood (78%), and how the learning process was going (80%). The total percentage result was 77%. The results of a needs analysis of class X students at SMKN 1 Kota Besi also support this. In that analysis, the availability of tools was 65%, the understanding of material was 78%, and the learning process was 78%. The total percentage result was 74%. You can also see this in the results of a needs analysis of class X students at SMKN 2 Sampit. In this analysis, the availability of tools was 70%, the understanding of material was 78%, and the learning process was 77%. The total percentage result was 75%. After looking at the needs of physical education, sports, and health teachers in these three schools, it's clear that the material understanding variable shows a low percentage of 75%. This is based on the availability of equipment, how well the teachers understand the material, and the students' learning processes. The needs analysis of class X students in these three schools is clear. The availability of equipment is low, with only 69% of students having access to the necessary tools. This could make it hard to put together lessons on how to throw a shot put.

Actually, there has been a lot of research on the development of modified media tools. One example is shot put media made from used rubber (Ariyanto & Hariyadi, 2020). Development of shot put media from clay wrapped in yarn, raffia, inner tubes, and paint is feasible (Setyawan & Kurniawan, 2020). However, there are no rubber craftsmen in the Kota Besi sub-district. If teachers are required to purchase them online, it will cost a lot. If they use shot put made of clay wrapped with thread, raffia, inner tubes, and paint, they won't last very long. This makes it impossible to choose either of these two media. The advantage of this modified ironwood shot put lies in its durability. Ironwood is resistant to humid temperatures, does not easily break, is not eaten by termites, becomes stronger the longer it is soaked in water, and is strong when used continuously in learning. Therefore, the media that can be used is the modified ironwood shot put. Media is one of the components in the learning system as a tool to support the learning process where the use of the media in learning activities will allow students to interact with an educator (Nurrita, 2018). According to Batubara, (2020) learning media are all forms of equipment used in the learning process that takes place in the school environment.

The natural wealth in Kota Besi and easy to hold is wood so that researchers intend to make a product for the development of learning media for shot put modification from ironwood material. Ironwood is a wood that is so strong that it is called iron wood, which is found in Kalimantan, especially in Central Kalimantan. Ironwood is wood that is resistant to changes in temperature, humidity, and is resistant to the influence of water and will not be brittle even though it is soaked in water continuously so that the nature of the wood is heavy and dense. Ironwood can never be eaten by termites and other wood destroying insects (Wardani, 2024).

With some of the problems that have been found, researchers want to solve these problems by developing modified learning media for shot put from ironwood. With this media, it is hoped that it can make it easier for teachers and students to carry out physical education, sports, and health learning of shot put shot athletic material, and be able to increase students' knowledge of basic shot put shot techniques. The development of modified learning media for shot put from ironwood material will certainly be easy to use by every student of SMKN 1 Kota Besi.

Based on the explanation above, the researcher will conduct a study entitled "Development of learning media for shot put modification from ironwood material for physical education, sports, and health learning at SMKN 1 Kota Besi".

METHOD

The research and development model uses the ADDIE research procedure (Branch, 2009). The following is a detailed explanation of the five stages of the ADDIE model (analyze, design, develop, implement, evaluate) in relation to the development of modified shot put learning media from ironwood. Analyze: In this case, the researcher talked with and watched physical education teachers as they taught students how to throw a shot put. The researcher also looked at the school's facilities and equipment for the shot put athletics branch at SMKN 1 Kota Besi. This showed that there was a lack of facilities, as evidenced by the absence of shot put equipment. As a result, physical education teachers had to borrow the equipment from PASI Kotawaringin Timur. Design: The researcher's goal was to find a way to make sure that physical education could still be taught in ways that help students learn about the mind, emotions, and body. The researcher's goal was to create a new learning tool for throwing shot put. It would be made from ironwood. Ironwood is a natural resource that is plentiful in Kota Besi and easy to get. This modified shot put is made from ironwood and is designed to be as similar as possible to a standard iron shot put, which has a diameter of 110-130 mm. Development: At this stage of development, there are several stages in the implementation

process. First, the form, durability, and testing are developed. Then, the modified shot put learning media product being developed is validated by learning experts, media experts, and practitioners. The revision stage is when we take suggestions and opinions from experts to make our product better. Implementation: At this stage, the researcher tests the developed product in real situations. They do this in small group trials and large group trials. The goal at this stage is to understand how students respond to and evaluate the final product, which is the modified shot put learning media made from ironwood. Evaluation: The evaluation stage is carried out by processing the results of validation by learning experts, media experts, and practitioners, as well as trials with small and large groups. This evaluation will determine the responses and assessments, as well as the level of feasibility. Researchers can then determine the percentage of success in developing the modified shot put learning media from ironwood. They can also draw conclusions based on the research results.

Product trials collect data to see if a product can be made and used. Feasibility means how well the product works, how efficiently it works, and how useful it is. There are five stages of product testing: (1) The test is designed in a way that includes expert evaluation. Three experts will conduct the evaluation. They are learning experts, media experts, and practitioners. The experts' evaluation aims to suggest improvements to the researcher's product. Ten students from class X at SMKN 1 Kota Besi tested the product design in a small group trial. A large group trial tested the product with 90 students from class X. These students came from three different schools: SMKN 1 Cempaga, SMKN 1 Kota Besi, and SMKN 2 Sampit. Each school had 30 students. (2) The test subjects included learning experts, media experts, practitioners, and tenth-grade students at SMKN 1 Cempaga, SMKN 1 Kota Besi, and SMKN 2 Sampit. (3) The data used included both qualitative data, such as suggestions and explanations, and quantitative data, such as numbers. The information in this development study was gathered through watching teachers at SMKN 1 Kota Besi and getting their opinions. The information in this study came from small group trials and large group trials. (4) The data collection techniques for needs analysis were observation and questionnaires. To collect data including a) Evaluation from experts (learning experts, media experts, practitioner experts), b) small group and large group trials. c) assessment or responses of class X students of SMKN 1 Cempaga, SMKN 1 Kota Besi, and SMKN 2 Sampit about the development of modified learning media for shot put from ironwood material, using a questionnaire. (5) The data analysis technique uses quantitative descriptive statistical analysis techniques. The measurement technique in data collection uses a likert scale (Sugiyono, 2019). Below is a data

processing formula in the form of quantitative descriptive analysis of percentages and also a table of product quality criteria to determine whether the product is suitable or not.

$$V = \frac{TSEV}{S - max} x\ 100\%$$

Description:

V : Validity

TSEV : Total empirical validity score

S-max : Expected maximum score

100% : Constant number

Table 1. Product quality criteria

Criteria	Description	Meaning
75,01%-100,00%	Highly valid	Used without revision
50,01%-75,00%	Valid	Used with minor revisions
25,01%-50,00%	Invalid	Unusable
00,00%-25,00%	Highly invalid	Prohibited use

Source: (Akbar & Sriwiyana, 2011)

RESULT

Figure 1. Modification of ironwood shot put

This shot put product will be material from ironwood. The ironwood used is wood with an old age, where the shape of this shot put modification is expected to resemble a standard shot put which has a diameter of 110-130 mm. The modification of the shot put developed is coated with wood glue and also plitures to maintain its durability. This modification of the ironwood shot put is not as strong as the standard shot put from iron. However, this modification of ironwood shot put has its own advantages, namely strong if used continuously on the ground instead of paving or a hard place, resistant to humid weather, not easily brittle even if soaked for years in water, and cannot be eaten by termites.

The results of this study involved calculating the percentage of scores from several experts and product trials, namely learning experts, media, practitioners, small group trials and large group trials, which were given by class X students in 3 schools, namely SMKN 1 Kota Besi, SMKN 1 Cempaga, and SMKN 2 Sampit. The percentage results are then interpreted

based on the criteria in determining the feasibility level of the product development of modified shot put learning media from ironwood material for physical education, sports, and health learning at SMKN 1 Kota Besi. The analyzed data will provide a clear picture of the product based on the product quality criteria table.

Learning expert

The results of the expert learning validation were reviewed based on how clear, accurate, suitable, easy to use, and attractive they were. The indicators include how clearly the display shows information, the size of the shot put vest modification, how well it increases student interest, how well it helps students learn, if the materials, form, content, and ease of use are suitable, and how attractive the shot put vest modification is. For data analysis of learning expert validators regarding the product development of modified learning media for shot put from ironwood material at SMKN 1 Kota Besi, see table 2.

Table 2. Learning expert validation

No	Variable	Maximum score	Score results	(%)
1	Clarity	12	11	92
2	Accuracy	8	6	75
3	Suitability	20	20	100
4	Ease	4	4	100
5	Attractiveness	8	8	100
	Total	**52**	**49**	**94**

In the clarity variable, it has a score of 11 with a percentage result of 92%, in the accuracy variable, it gets a score of 6 with a percentage result of 75%, and in the suitability variable, it gets a score of 20 with a percentage result of 100%, in the convenience variable, it gets a score of 4 with a percentage result of 100%, and in the attractiveness variable, it gets a score of 8 with a percentage result of 100%, so the total score obtained is 49 with a percentage result of 94%. Based on the results of data analysis, it can be seen through the product quality criteria table that the product development of modified shot put learning media from ironwood material for physical education, sports, and health learning at SMKN 1 Kota Besi is feasible to use and falls into highly valid criteria.

Media expert

The results of the media expert review are based on how suitable the website is, how easy it is to use, and how attractive it is. The indicators include how well the materials work, how they look, how strong they are, if they can be made shot put, how attractive they are, and what kind of materials they are made of. For data analysis of media expert validators regarding the

product development of modified learning media for shot put from ironwood for physical education, sports, and health learning at SMKN 1 Kota Besi can be seen in table 3.

Table 3. Media expert validation

No	Variable	Maximum score	Score results	(%)
1	Suitability	20	19	95
2	Ease	8	7	88
3	Attractiveness	24	24	100
	Total	**52**	**50**	**96**

In the suitability variable, the result score is 19 with a percentage result of 95%, the convenience variable gets a score of 7 with a percentage result of 88%, and the attractiveness variable gets a score of 24 with a percentage result of 100%, so the total score obtained is 50 with a percentage result of 96%. Based on the results of data analysis, it can be seen through the product quality criteria table that the product development of modified shot put learning media from ironwood material for physical education, sports, and health learning at SMKN 1 Kota Besi is feasible to use and falls into highly valid criteria.

Practitioner expert

The results of the expert practitioner validation were reviewed based on how accurate it was, how easy it was to use, how suitable it was, how attractive it was, and how complete it was. The indicators included how well the material was used, how easy it was to use, if it was suitable for the learning objectives, student needs, motor development, how well it was implemented, if the material was suitable, how easy it was to use, how appealing the shot put modifications were, and how complete the product was. For data analysis of practitioner expert validators regarding the product development of modified learning media for shot put from ironwood material for physical education, sports, and health learning at SMKN 1 Kota Besi can be seen in table 4.

Table 4. Practitioner expert validation

No	Variable	Maximum score	Score results	(%)
1	Accuracy	8	7	88
2	Feasibility	8	6	75
3	Suitability	20	17	85
4	Ease	8	7	88
5	Attractiveness	8	6	75
6	Completeness	4	2	50
	Total	**56**	**45**	**80**

In the accuracy variable, it has a score of 7 with a percentage result of 88%, in the feasibility variable, it gets a score of 6 with a percentage result of 75%, and in the suitability variable, it gets a score of 17 with a percentage result of 85%, in the convenience variable, it

gets a score of 7 with a percentage result of 88%, in the attractiveness variable, it gets a score of 6 with a percentage result of 75%, and in the completeness variable, it gets a score of 2 with a percentage result of 50%, so the total score obtained is 45 with a percentage result of 80%. Based on the results of data analysis, it can be seen through the product quality criteria table that the product development of modified shot put learning media from ironwood material for physical education, sports, and health learning at SMKN 1 Kota Besi is feasible to use and falls into highly valid criteria.

Small group trial

For the analysis of small group trial data regarding the product development of modified learning media for shot put from ironwood material for physical education, sports, and health learning at SMKN 1 Kota Besi, see table 5.

Table 5. Results of small group trial class X SMKN 1 Kota Besi

No	Variable	Class	Maximum score	Score results	(%)
1	Usability	X	280	247	88
2	Ease	X	120	110	92
3	Attractiveness	X	200	181	92
Total			**600**	**538**	**90**

In the X class usability variable, the result score is 247 with a percentage result of 88%, in the X class convenience variable, the result score is 110 with a percentage result of 92%, and in the X class attractiveness variable, the result score is 181 with a percentage result of 92%, then the total score obtained is 538 with a percentage result of 90%. Based on the results of data analysis, it can be seen through the product quality criteria table that the product development of modified shot put learning media from ironwood material for physical education, sports, and health learning at SMKN 1 Kota Besi is feasible to use and falls into highly valid criteria.

Large group trial

For the analysis of large group trial data regarding the product development of modified learning media for shot put from ironwood material for physical education, sports, and health learning can be seen in table 6.

Table 6. Results of large group trial of class X SMKN 1 Cempaga

No	Variable	Class	Maximum score	Score results	(%)
1	Usability	X	840	789	94
2	Ease	X	360	332	92
3	Attractiveness	X	600	579	97
Total			**1800**	**1700**	**94**

In the usability variable, class X has a result score of 789 with a percentage result of 94%, in the class X convenience variable, it gets a result score of 332 with a percentage result of 92%, and in the class X attractiveness variable, it gets a result score of 579 with a percentage result of 97%, so the number obtained is 1700 with a percentage result of 94%. Based on the results of data analysis, it can be seen through the product quality criteria table that the product development of modified learning media for shot put from ironwood material for physical education, sports, and health learning is feasible to use and falls into highly valid criteria.

For data analysis of large group trials regarding the product development of modified learning media for shot put from ironwood material for physical education, sports, and health learning can be seen in table 7.

Table 7. Results of large group trial class X SMKN 1 Kota Besi

No	Variable	Class	Maximum score	Score results	(%)
1	Usability	X	840	725	86
2	Ease	X	360	295	82
3	Attractiveness	X	600	515	86
	Total		**1800**	**1535**	**85**

In class X usability variables have a result score of 725 with a percentage result of 86%, in class X convenience variables get a result score of 295 with a percentage result of 82%, and in class X attractiveness variables get a result score of 515 with a percentage result of 86%, then the total score obtained is 1535 with a percentage result of 85%. Based on the results of data analysis, it can be seen through the product quality criteria table that the product development of modified shot put learning media from ironwood material for physical education, sports, and health learning is feasible to use and falls into highly valid criteria.

For data analysis of large group trials regarding the product development of modified learning media for shot put from ironwood material for physical education, sports, and health learning can be seen in table 8.

Table 8. Results of large group trial of class X SMKN 2 Sampit

No	Variable	Class	Maximum score	Score results	(%)
1	Usability	X	840	620	74
2	Ease	X	360	271	75
3	Attractiveness	X	600	470	78
	Total		**1800**	**1361**	**76**

In the usability variable, class X has a result score of 620 with a percentage result of 74%, in the class X convenience variable, it gets a result score of 271 with a percentage result of 75%, and in the class X attractiveness variable, it gets a result score of 470 with a percentage result of 78%, then the total score obtained is 1361 with a percentage result of 76%. Based on

the results of data analysis, it can be seen through the product quality criteria table that the product development of modified shot put learning media from ironwood material for physical education, sports, and health learning is feasible to use and falls into highly valid criteria.

Product Revision

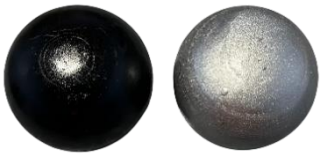
Revisions are based on assessments, criticisms and suggestions from expert validators and the results of small group and large group trials. The purpose of the revised product is to perfect the product development of modified shot put learning media from ironwood material for physical education, sports, and health learning at SMKN 1 Kota Besi.

Table 9. Assessment and suggestions

No.	Assessment and suggestion	Description
1.	Media expert	
	a. Hope the size must be adjusted.	
	b. More refined.	
	c. The need for colorful colors.	
	d. Must be reproduced.	Already revised
	e. Safety should be considered more.	
	f. Be more visible in terms of manufacturing.	
	g. The need for product labeling.	
	h. Hopefully it will be neater in manufacturing	

The following is a comparison of the product development of modified shot put learning media from ironwood material for physical education, sports, and health learning before and after revisions according to input and suggestions from experts:

Table 10. Comparison of product display of learning media development modification of shot put from ironwood material for physical education, sports, and health learning before and after revision

Before revision	After revision
Media expert 	

DISCUSSION

This research product is a modified learning media for shot put from ironwood material, designed for use in physical education, sports, and health. The advantages of this product are that it is strong when used continuously on the ground, not on pavement or hard surfaces, it is resistant to humid weather, it does not become brittle even after years of being submerged in water, and it is not susceptible to termites. Ironwood has been used by the Dayak tribe of

Kalimantan for hundreds of years, especially in the manufacture of traditional houses such as Betang in Central Kalimantan and Lamindi in East Kalimantan (Effendi, 2009). Ironwood is one of the largest natural resources growing on the island of Borneo. In fact, the utilization of ironwood is still quite low. So that the development of this product has the hope of being able to help teachers in Kalimantan to be more creative in creating a product in the form of tool modifications which will benefit students in the implementation of learning. Learning media is a tool that conveys information to students which has the aim of making students understand the learning material conveyed by the teacher (Dewi & Kurniawan, 2021). According to Kurniawan et al., (2022) explained that the development of learning media made with various media can help teachers to add references to teaching materials at school and can also increase students interest and motivation to learn.

The product development of modified learning media for shot put from ironwood material for physical education, sports, and health learning has limitations, namely: 1) The modified learning media for shot put developed for students at SMKN 1 Kota Besi is still in limited quantities. 2) This product is made using ironwood which only exists in Kalimantan. 3) If the ironwood used is too young it is prone to cracking and breaking. 4) Modification of shot put from this ironwood material is not strong and easily broken if used in hard places such as paving. 5) The weight of the modified shot put from ironwood is far from the same as the standard shot put from iron. 6) This modification of the shot put from ironwood is only for learning basic techniques and cannot be used for training or increasing students' strength abilities.

Researchers developed a new product. They used learning media to modify an ironwood shot put. This product is a tool that has been modified for use by physical education teachers. It helps students become more interested in learning. In line with Ali, (2023) the solution to the problems faced by teachers regarding the lack of facilities is to modify the tool because the modification of the tool will make students active in groups and learn together to achieve the results they want. According to Stun et al., (2024) in addition to modifying learning tools, it can also modify learning in terms of movement games as a suitable means and also entertain students. This is also reinforced by research Ginting et al., (2024) This product is a digital Sambo sports book. It has its own advantages for coaches. They can use it to solve problems in Sambo sports techniques. This digital Sambo sports book will be a reference for athletes and coaches. It will provide information about basic Sambo sports techniques.

The modified shot put Media learning product made from ironwood has been validated by learning and media experts, as well as practitioners. 1) Learning experts validated the clarity

variable with a score of 11 and a percentage of 92%; the accuracy variable with a score of 6 and a percentage of 75%; the suitability variable with a score of 20 and a percentage of 100%; the ease variable with a score of 4 and a percentage of 100%; and the attractiveness variable with a score of 8 and a percentage of 100%. The total score was 49%, which falls within the highly valid criteria. Therefore, learning expert validation shows that no revisions or suggestions are needed for the shot put learning media product made from ironwood. 2) Media expert validation on the suitability variable scored 19%, on the ease variable scored 7%, and on the attractiveness variable scored 24%. The total score was 50, or 96%, which falls within the highly valid criteria. Thus, the media expert validation results indicate that revisions and suggestions are needed for the shot put media development product made from ironwood. The suggestions are to adjust the size and shape, refine it, make it colorful, consider safety, and produce more backup products. 3) Practitioner expert validation score for the accuracy variable is 7, with a percentage score of 88%. For the feasibility variable, the score is 6, with a percentage score of 75%. For the suitability variable, the score is 17, with a percentage score of 85%. For the ease variable, the score is 7, with a percentage score of 88%. For the attractiveness variable, the score is 6, with a percentage score of 75%. For the completeness variable, the score is 2, with a percentage score of 50%. The total score was 45%, which falls within the highly valid criteria. Therefore, the results of the practitioner expert validation indicate that there are no revisions or suggestions for development of learning media for shot put modification from ironwood material.

Based on the results of the small group test on 10 class X students at SMKN 1 Kota Besi, namely on the usability variable 88% for highly valid product quality criteria. The ease variable has 92% for highly valid product quality criteria. And on the attractiveness variable 92% for the product quality criteria are highly valid. Therefore, researchers summed up all class X data at SMKN 1 Kota Besi from the maximum score to the result score of the three variables, namely, usability, convenience, and attractiveness. For the three variables, the percentage of 90% is included in the criteria for highly valid product quality.

In line with research Sobarna, (2018) with subjects totaling 20 seventh grade students. From the results of data analysis, the modification of the tool has a positive effect on learning physical education, sports, and health athletic material to throw shot put. In line with the research of Efendi et al., (2018) conducted on VII B class students totaling 21 students. Based on data analysis, it is concluded that the use of plastic ball modifications can provide positive results and improve student learning in the athletic material of O'brien style shot put throwing. This is also reinforced by research Fendi, (2015) class VIII research subjects totaling 32

students. These results show that class action research with two cycles can improve physical education learning in the athletic material of O'brien style shot put shot put on students.

Based on the results of the large group test on 30 class X students at SMKN 1 Cempaga, the usability variable has a percentage of 94% for highly valid product quality criteria. The convenience variable has a percentage of 92% for highly valid product quality criteria. And the attractiveness variable has a percentage of 97% for highly valid product quality criteria. Therefore, researchers summed up all class X data at SMKN 1 Cempaga from the maximum score to the result score of the three variables, namely, usability, convenience, and attractiveness. For these three variables, the percentage of 94% is included in the criteria for highly valid product quality.

In line with research Fitriyanto, (2017) which was conducted in elementary schools with 38 students as subjects. Based on the results of data analysis regarding the improvement of the basic technique of rejecting modified shot put from the dynasty ball in students, it can be concluded that this research is considered successful. In line with the research of Sultoni & Ferianto, (2014) conducted in elementary schools with 151 students as subjects. The results of the data analysis show that students' shot put throwing numbers improved significantly when the physical education curriculum included modified games. This suggests that game modifications can enhance the effectiveness of teaching physical education athletic material to students. This is reinforced by Hulaimi et al., (2024) in which the subjects of this study were 31 VII grade junior high school students. It can be concluded that the use of plastic balls filled with sand as a medium in learning physical education material for shot put athletics can improve student learning outcomes. This is evident before being given action has a low category and after being given action it increases to a high category.

Based on the results of the large group test on 30 class X students at SMKN 1 Kota Besi on the usability variable has a percentage of 86% for highly valid product quality criteria. The convenience variable has a percentage of 82% for highly valid product quality criteria. And the attractiveness variable has a percentage of 86% for highly valid product quality criteria. Therefore, researchers summed up all class X data at SMKN 1 Kota Besi from the maximum score to the result score of the three variables, namely, usability, convenience, and attractiveness. For these three variables, the percentage of 85% is included in the criteria for highly valid product quality.

In line with research Yova & Dewantoro, (2019) with the subjects in this study were 6 SMALB class XI students. From the analysis of the results of the study, it was concluded that if the students' shot put throwing skills before getting treatment had a low value and after being

given treatment could increase. Therefore, the modification of the shot put shot has an effect on the basic technical skills of the student's shot put shot. In line with research Ismail, (2023) the subjects of this study were 19 students of class X SMKN. The results showed that the learning outcomes of students through cycles I and II showed a level of student learning outcomes in the athletic material of throwing shot put. This is also reinforced by the research of Wahyudin et al., (2021) with the subjects of class VIII junior high school totaling 23 students. Based on the results of this study, it can be concluded that when comparing the initial and final tests, most of the results obtained by students have increased.

Based on the results of the large group test on 30 class X students at SMKN 2 Sampit, the usability variable has a percentage of 74% for highly valid product quality criteria. The convenience variable has a percentage of 75% for highly valid product quality criteria. And the attractiveness variable has a percentage of 78% for highly valid product quality criteria. Therefore, researchers summed up all class X data at SMKN 2 Sampit from the maximum score to the result score of the three variables, namely, usability, convenience, and attractiveness. For the three variables, the percentage of 76% is included in the criteria for highly valid product quality.

In line with research Prabowo, (2018) with the subject of this research VIII grade students as many as 38 students. Then the results obtained by orthodox style shot put throwing skills with modified games can improve students' basic technical abilities. So the results obtained by orthodox style shot put skills with modified games can improve students' basic technical abilities. In line with the research of Basundoro et al., (2023) with the subject of grade V elementary school students totaling 26. So there is an increase in the learning outcomes of physical education in the athletic material of O'brien style shot put through tool modification. The increase was seen through the test scores of students in the first and second cycle tests, all of which were completed in learning physical education material for the basic O'brien style shot put throwing technique which was done well. This is reinforced by Suryaningsih, (2018) with the subject of 17 grade VI elementary school students. From the findings, it has increased through teacher, student, and learning outcomes activities. It has been concluded that if the modified media plastic ball shot put in applying it can improve student learning outcomes in physical education learning material athletic shot put.

We can compare a standard shot put and a modified shot put. The standard shot put is used to improve throwing skills. Meanwhile, the modified shot put made of ironwood is only for learning purposes. It aims to increase students' knowledge of basic shot put techniques and also allows more students to participate in physical education classes. Another advantage of

the modified shot put made of ironwood is that it makes learning physical education material on shot put fun and does not make students afraid to use it. The problem with regular shot putts is their weight. Not all students can use this weight to its full potential because each student has different physical strengths. However, the main material used for this modified shot put is ironwood, which is only found in Kalimantan. This poses a challenge in terms of its production. Another problem with the modified shot put made from ironwood is that it can only be used on soil and not on hard surfaces like paving. The modified shot put made from ironwood cannot improve the distance of the throw and can only be used to teach the basic techniques of shot put.

After the development of modified learning media products of shot put from ironwood material for physical education, sports, and health learning, it is hoped that it can be more varied in terms of the selection of materials used and more modern, so as to increase student learning attention and can increase teacher knowledge to be more creative in making learning tool modification products so that the desired learning process will be achieved.

CONCLUSIONS

A comprehensive analysis of the research results shows that the development of modified shot put learning media made from ironwood for use in physical education, sports, and health education, particularly for class X students at SMKN 1 Kota Besi, is practical and feasible. This conclusion is based on the results observed when applying physical education, sports, and health teaching materials for shot put athletics. These results are also obtained from the evaluation of expert validators consisting of learning experts, media experts, and practitioner experts who are assessed from several research variables. Not only that, it can be seen from the results of the needs analysis and also from the results of the data analysis of product trials in small group and large group tests. The results of the evaluation of expert validators and product trials in the group demonstrate the feasibility of developing modified shot put learning media from ironwood material for use in physical education, sports, and health learning. This product has the potential to enhance the shot put athletic material learning process for students at SMKN 1 Kota Besi. However, further development is necessary to optimize its effectiveness. Researchers have proposed that the development product in question be given greater consideration with respect to its capacity to encompass others and ensure safety.

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