Global Journal of Learning Innovation and Educational Research (GJLIER)
Vol. 1, No. 1, Januar 2026, pp 27 - 43
E-ISSN: 2507-2907

Development Bintarya learning media (solar system bingo) to increase students' motivation to learn science subjects

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DOI: https://doi.org/10.5362x/gjlier
Received: Agu 19, 2025
Revised: Nov 5, 2025
Accepted: Dec 10,2025

Abstract: The purpose of this study was to develop Bintarya learning media (Bingo Solar System) especially on solar system material in grade VI Elementary School. The method used in this study is the research and development through the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) approach whose research focus is on solar system material is based on the trial of product feasibility and practicality with respondents in the implementation, namely expert validation tests, teacher response questionnaires. This study was measured through a simple evaluation in measuring the achievement of student learning motivation based on statistical tests stating the r-table value in this study where N = 30 and sig. 0.05 of 0.361. From the results of the validity test in the table above, it is known that the feasibility variable has a calculated r-value> r-table, so it can be said that all statement items in the feasibility variable are valid and can be used as a measuring tool in research. From the results of the reliability test, it is known that the Cronbach's Alpha value on the feasibility variable is 0.820 n> 0.6 and is consistent or reliable. In the implementation of the product, there was an increase in student learning motivation, before receiving treatment by 56.7% and after treatment the average score increased to 93.3%. This can be interpreted that the implementation of Bintarya Learning Media (Bingo Tata Surya) is quite good at increasing student motivation in learning science subjects.

Keywords: *Bintarya (Solar System Bingo), Learning Media, Science, Solar System, Quantitative*

INTRODUCTION

21st-century learning is characterized by an approach that emphasizes critical thinking skills, collaboration, communication, creativity, technological literacy, and problem-based learning. The characteristic of this learning is placing students as the center of learning (student-centered learning), which can significantly increase students' learning motivation. According to Trilling and Fadel (2009), 21st-century learning encourages active student involvement through contextual and collaborative projects. This creates a sense of belonging and relevance, which are important factors in fostering intrinsic motivation. In addition, according to research by Rahmawati and Suryani (2020), the use of project-based learning strategies and technology in the context of the 21st century has been shown to increase student motivation, because students feel that learning is more meaningful and enjoyable. 21st-century learning allows for learning differentiation, namely adjusting the approach to students' learning styles, which makes students feel valued and understood, so that learning motivation increases (Tomlinson, 2014).

Mastery of 21st Century learning is important to teach so as to ensure that students have the skills to learn and innovate, use technology and information media, and can work and survive by using skills to live. This 21st century learning is relevant to the four pillars of education which include learning to know, learning to do, learning to be and learning to live together. Learning to Know means that learning

should direct students to have broad knowledge (Muliastrini, 2020). Mastery of the material is a very important thing that must be pursued by students. Therefore, students must have great motivation to always learn to deepen their knowledge which is always developing from time to time (Nabilah & Nana, 2020).

Science is useful for children's future lives or work, part of the nation's culture, trains children to think critically, and has educational values, namely having the potential to shape children's personalities as a whole. Science education should be implemented properly in the learning process at school considering the importance of the lesson as stated above (Irdalisa, et al, 2022). Science learning is said to be successful if all predetermined learning objectives can be achieved, which are revealed in science learning outcomes (Soleman & Umanahu, 2023). The achievement of science learning in the 21st century will be realized by reforming the quality of education, helping student development, personalizing learning, emphasizing project/problem-based learning, encouraging collaboration and communication, increasing student participation and motivation, increasing creativity and innovation in teaching (Irdalisa, et al., 2024), using appropriate teaching equipment, planning relevant learning activities and being real with the world, strengthening metacognition and developing student-centered learning, (Prabawati, 2022).

The learning method that is considered appropriate for elementary school children is learning through direct experience, their own thoughts that are developed and explored through teacher guidance, and so on. This learning method strengthens children's memory by using teaching aids, stationery and learning media (laboratories) that are in the elementary school children's environment (Mahardika & Yusmar, 2023). Based on the statement above, learning in the educational institutions above explains that the learning process or teaching-learning process activities do not only require students to focus on learning in the cognitive domain but when the learning process is carried out, an educator, namely a teacher, should be able to make students enthusiastic both in terms of thinking skills and student comfort during the teaching and learning process.

Educators can create a fun learning atmosphere and make students active in learning and can help students find their talents and independence without any coercion so that students' physical and psychological development is good. However, in reality, students are still very passive, there is no high learning motivation, and there are schools that have low science learning outcomes because they have not reached the predetermined completion standards. This problem occurs due to many factors. Factors that can influence the realization of the function of education in learning are teacher and student factors in the learning process. Learning process activities are said to be successful if there is a change in student behavior that is in accordance with the goals to be achieved (Hotimah, 2023).

Effective, enjoyable, interesting, and meaningful learning process activities for students are influenced by various elements, including teachers being able to fully understand the nature, nature, and characteristics of students, student-centered learning methods (Student Center), adequate student learning facilities and infrastructure, and the availability of various interesting learning resources and learning media. Based on the results of TIMSS and observations that have been carried out, it shows that student motivation is still low. This is indicated by students who are not yet seen to be active in learning. (Mimbarwati et al., 2023).

Based on the results of observations and interviews with 2 teachers of class VI SDN Jelambar 03 Pagi on January 2, 2023, data was obtained that in the learning process, several problems were found, including; lack of appropriate and interesting learning methods and media, the methods used only with question and answer methods, lectures, assignments have indeed been quite colorful in learning, however, these methods have not fully provided opportunities for students to experience the learning process actively and in depth. This can be seen from the low enthusiasm of students in science subjects, especially the solar system material. And it is proven by the results of the summative science test for class VI SDN Jelambar 03 Pagi, from the minimum criterion completion value of 72, the average classical learning completion for class VI was 56.65%. Therefore, an innovation in learning methods and media is needed in the learning process that can increase learning motivation and create active, interesting and enjoyable learning conditions in the classroom.

To help improve students' learning motivation and create effective, interesting and easy-to-understand learning, various improvement efforts are needed in the learning process, one of which is by using the development of creative and interesting learning media for students. Learning media is anything that can carry information or messages in the learning process. Learning media according to (Fadilah et al., 2023) can function as a communication tool in learning process activities. In addition, learning media according to (Wulandari et al., 2023) can stimulate students' attention, interest, thoughts, and feelings in learning activities to achieve learning goals and can also generate learning motivation.

Based on research related to learning media, one of the innovative and interesting learning media is the Bingo educational game media, with this children will be actively involved (student center) so that they can make students' understanding better. This has been proven by several previous studies, including a study conducted by Elementary School Teacher Educators STKIP PGRI Lubuklinggau, proving that by using bingo game media in their research at SD Negeri Kadung Jenar showed an increase in learning outcomes, namely when the pretest was only 51.13% then increased to 72.66% after the posttest (Oktaviani et al., 2019).

The development of innovative learning media such as Bintarya (Solar System Bingo) is very important in increasing students' learning motivation, especially in science learning. This media combines educational and recreational elements that are in accordance with the characteristics of students in the modern era. According to Arsyad (2021), interesting and interactive learning media can help create a fun learning atmosphere, thereby increasing active student participation and fostering intrinsic motivation. Bintarya in the form of an educational game Bingo provides a fun, competitive, and game-based learning experience, which has been proven effective in stimulating students' learning motivation.

In the context of learning the Solar System material, which is abstract, the use of media such as Bintarya can help visualize difficult concepts to be easier to understand. This strengthens students' cognitive and emotional involvement. According to Daryanto and Karim (2017), learning media that is adjusted to the characteristics of the material and students will make the learning process more effective and enjoyable. The BINGO game of grade IV MI Nurul Yaqin can be seen from before the BINGO game was implemented, and after the BINGO game was implemented, it showed an increase in students' ability to solve problems (creative thinking skills) of multiplication and division after the BINGO game was implemented. Before the researcher implemented the BINGO game, the average student score was 50.58 after the researcher implemented the BINGO game, the learning outcomes increased with an average student learning outcome of 80 (Bali, 2019).

Most of the research that has been done is more research to measure learning outcomes only or only measure problem-solving abilities (creative thinking). And the research is also still limited in the scope of the subject, there are still not many who research learning motivation in science subjects, especially solar system material for grade 6 of elementary school. And from previous research, there are still few researchers who have developed a Bingo learning media for science subjects, especially in solar system material for grade VI of elementary school to increase student learning motivation. Based on the background above, the focus of this research is to increase student learning motivation in science subjects for grade VI of elementary school by developing Bintarya learning media (Bingo Solar System).

METHODOLOGY

This study adopts a developmental research design with the four stages involved; analysis, design, development, and evaluation. This research has been carried out for three months, starting from February to March 2025. The context of this research is to develop and validate a learning media Bintarya (Bingo Tata Surya) to improve students' learning motivation in science subjects in grade VI of elementary school.

The first stage: define (definition): Activities carried out include analyzing the competencies needed by students, observing directly in the field regarding student needs in the learning process, observing science teachers related to the learning process that has been carried out, analyzing findings

and concluding problems faced by students and teachers during the learning process, and conducting literature studies. *The second stage*: design: Activities carried out include making product designs in the form of determining the components of Bintarya learning media. Selection of teaching materials and design of Bintarya learning media implementation guidelines and designing product evaluation tools that will be used to assess learning media. *The third stage*: development, Activities carried out include finding and collecting references needed in media development, compiling evaluation instruments and others. Conducting small group trials to determine the feasibility of the product for use in the learning process, trials are carried out to determine the level of validity of the content and indicators and analysis of research instruments. The products that have been developed are then assessed by experts to check the feasibility of the product and small group trials are carried out again to determine the feasibility of the product after the feasibility test is carried out. The findings obtained are then revised again. *The fourth stage*: disseminate, Conducting an evaluation of the results of the products that have been developed.

Data collection in this study consisted of qualitative data. Qualitative data were obtained from the responses of material experts and media experts regarding the material, learning and display aspects. This study used several instruments in data collection, including instrument questionnaires, as well as practicality assessment sheets from learning experts, and material assessment sheets from material experts. This product practicality assessment sheet aims to obtain data related to the practicality of learning media. The subjects of this research and development include two subjects: a. The first subject is the validator, which consists of learning media experts and material experts. b. The second subject of the trial is grade VI students of SDN Jelambar 03 Pagi. The questionnaire consisting of 4 alternative answers, namely 1, 2, 3, and 4 states: strongly disagree, disagree, agree, and strongly agree (Rahayu, 2021). The following is the validation sheet of media experts and material experts.

Table 1. Grid of the Validity Questionnaire Instrument for Learning Media Experts

No	Aspect	Indicator	Item Number
1	Media Coloring	1. The combination of media colors is attractive	1
		2. The proportion of colors does not interfere with vision/ is not too striking	2
		3. The colors on the media are durable and do not fade easily	3
2	Image, Letter/Word Display	4. Selection of font type and size according	4
		5. The layout of letters and images is balanced	5
		6. Selection of images according to the material	6
3	Media Design	7. The design of the media display is original and attractive	7
		8. Media can be used as an alternative learning	8
		9. Media is easy to use	9

Table 2. Grid of the Subject Matter Expert Validity Questionnaire Instrument

No	Aspect	Indicator	Item Number

1	Compliance with the 2013 Curriculum	1. The material refers to the 2013 curriculum on solar system material	1
		2. The material is in accordance with KD 3.7 Describing the solar system, the sun as the center of the solar system, and the position and characteristics of the members of the solar system	2
2	Material Suitability	3. The material presented has clear references	3
		4. The material presented is in accordance with the cognitive abilities of students	4
		5. The material presented is in accordance with the facts	5
3	Completeness of Material	6. The material presented is presented in a coherent manner	6
		7. The material presented uses appropriate examples	7
		8. The material presented increases students' insight and motivation	8

Table 3. Teacher Response Eligibility Questionnaire Instrument Grid

No	Aspect	Indicator	Item Number
1	Learning Material Design	a. The appropriateness of the media title with the material	1
		b. The appropriateness of the practice questions in the media with the competencies presented	2
		c. The appropriateness of the practice questions in the media with the material presented	3
		d. Student motivation after participating in learning using the media	4
		e. The appropriateness of the development of Bintarya learning media (Bingo Solar System) on the solar system material for grade VI SD	5
2	Operational	a. Availability and clarity of media instructions	6
		b.Ease of navigation in media operation	7
3	Visual Communication	a. Suitability of font type in media Suitability of size, color,	8
		b.image resolution in media Language used in media	9
		c. easy to understand	10

to know the attitudes and opinions of media experts and material experts regarding the feasibility of the product being developed. The Likert scale table for assessing the questionnaire instrument is as follows:

Table 4. Assessment Scale for the Feasibility Test Questionnaire Instrument

Value Scale	Interpretasi
4	Very feasible
3	Feasible
2	Less feasible
1	Not feasibl

Table 5. Classification of Average Validation/Feasibility Scores

Average Score	**Classification/Category**
$3{,}25 \leq xi \leq 4{,}00$	Very feasible
$2{,}50 \leq xi \leq 3{,}24$	Feasible
$1{,}75 \leq xi \leq 2{,}49$	Less feasible
$1{,}00 \leq xi \leq 1{,}74$	Not feasibl

This study was analyzed through qualitative descriptive analysis. The qualitative descriptive analysis technique was carried out based on the results of the validation of material and media experts. Validation of this instrument is carried out to meet content validity and empirical validity. The instrument validation in this study was analyzed using the Aikens' V formula, which is to determine the content validity coefficient, which is presented in table 6 below.

Table 6. Criteria For Instrument Validity Level

V-Value	Validity Level
0.80 –1.00	Very high
0.60 –0.80	High
0.40 –0.60	Currently
0.20 –0.40	Low
0.00 –0.20	Very Low

The estimated reliability of the instrument is calculated based on the Cronbach alpha index. The classification of instrument reliability levels is presented in table 7.

Table 7. The Level Of Reliability Based On The Value Of Alpha

Alpha	Reliability level
0.00 -0.20	Less Reliable
> 0.20 –0.40	Somewhat Reliable
> 0.40 –0.80	Quite Reliable
> 0.60 –0.80	Reliable
> 0.80 –1.00	Very Reliabel

RESULT AND DISCUSSION

The product results that have been made from this study are in the form of Bintarya learning media (Solar System Bingo) on the solar system material for grade VI students. The Bintarya media product (Solar System Bingo) was made based on the ADDIE development model. The researcher chose the ADDIE development model because the ADDIE model is very easy to use as a guideline in developing a product (Satriawan, 2021). However, because this study had limited time and research limitations, in the evaluation stage, the researcher only applied the validity and feasibility of the product to 2 experts related to media and materials, 2 teachers and 30 grade VI students consisting of Bintarya media (Solar System Bingo) in the form of a Bintarya Board and 24 Bintarya cards containing solar system objects, and 24 Bintarya answer cards through the Bintarya work board which was worked on by students in groups. This research is in line with Fida Mega Nur Hidayati's research which only researched through the stages of analysis, design, implementation and development. (Hidayati et al., 2022).

Analysis Stage

The problems found at SDN Jelambar 03 Pagi through literature studies and field studies conveyed by teachers as resource persons named Santi Nurlitha Sari, S,Pd., and Yuli Herawati, S.Pd. in the interview activity stated that based on the analysis of teacher needs, it can be seen that the curriculum used is directed at learning objectives but has not been maximized in developing learning media, and less than optimal in activating motivation in the learning process in the classroom, and based on the results of the interview, problems were found, namely students do not understand the solar system material if they only read the material or readings and the media used by the teacher is less than effective, resulting in learning motivation in the learning process of students being less than optimal.

Based on the analysis of student needs, the learning outcomes of students in the Natural Sciences subject of the solar system material have not reached the Minimum Completion Criteria (KKM) with an average class value of 56.65. Based on the analysis of student needs, it is necessary to improve student outcomes. Therefore, the researcher attempted to develop a product in the form of Bintarya (Solar System Bingo) learning media on the solar system material for Grade VI Elementary Schools, by utilizing a tool in the form of a Bintarya (Solar System Bingo) board with 24 Bintarya (Solar System Bingo) cards and 24 answer cards to deepen understanding, knowledge and increase learning motivation on the solar system material with educational game tool content.

Design Stage

At the design stage, the researcher carries out activities to compile an instrument for assessing the quality of learning media that will be filled in by expert validators and compile a response questionnaire about the attractiveness of the learning media that will be filled in by students. At the design stage, the researcher also designs a product in the form of a design or draft of the Bintarya game media (Solar System Bingo) using the Canva application. At this stage, the researcher also compiles materials to determine the text of the material in the form of questions consisting of symbols of images of solar system objects, which will be included in the Bintarya game media product (Solar System Bingo), as well as answer cards from the question cards that will be selected by students in groups according to the characteristics of the symbols / images on the Bintarya question cards. The tools and materials needed to make bingo card game media products are magnetic boards, magnetic cards. The product design of the Bintarya game media (Bingo Solar System) using the Canva application is as follows:

The design of this material is made using the Canva application, the design of this material is made sequentially from the understanding and introduction of the solar system, types of planets, the arrangement and order of planets from the smallest to the largest planets, from inner planets and outer planets, as well as the characteristics of each planet and other celestial bodies that are arranged in the solar system, in addition in the Power Point of this material there are trigger questions, learning objectives, as well as songs about planets and learning videos of solar system material. This material will be given first as an explanation of the solar system material to students before the Bintarya learning media is used.

Figure 1. Bintarya Learning Material Design Plan (Solar System Bingo) Solar System Material

Development

After the learning media has been designed, the researcher prints the media products that have been designed or planned previously. After the Bintarya game media (Bingo Solar System) has been printed, the media is attached to a magnetic board. After the magnetic board and 24 Bintarya magnetic cards (Bingo Solar System) and 24 Bintarya answer cards (Bingo Solar System) are finished, validation is carried out to the design expert validator, the material expert validator. The data obtained from the design expert validator, the material expert validator, are quantitative data and qualitative data.

Table 8. Results of Media Expert Assessment Instrument

No	Assessment Aspects		Statement	Skor				Total Average	Valid
				1	2	3	4		
1	Media Coloring	1	Attractive media color combination				4	4	Very Valid / Eligible
		2	Color proportion does not disturb vision/not too striking				4		
		3	Colors on media are durable and do not fade easily				4		
2	Image Display, Letters / Words	4	Selection of font type and size appropriate				4	3,67	Very Valid / Eligible
		5	Layout of letters and images balanced			3			
		6	Selection of images according to the material				4		
3	Media Design	7	Original and attractive media display design			3		3,5	Very Valid / Eligible
		8	Media can be used as an alternative learning tool				4		
		9	Media is easy to use				4		
		10	Media is strong and not easily damaged			3			

			Average (Total)					3,72	Very Valid / Eligible

Based on the following statement, the development of learning media on the Solar System material for Grade VI Elementary Schools based on the aspects of media coloring, image display, letters/words and media design on the media shows an average of 3.72 in a percentage of 92.5% declared valid with very feasible criteria. The revision suggestions are that the concept, design and appearance of the Bintarya learning media (Solar System Bingo) have been designed quite well and attractively. Suggestions should be added to the process flow to arrange the selected numbers, for example with a counting puzzle question or using dice media shaken per group to make the game flow more interesting.

Table 9. Results of the Material Expert Assessment Instrument

No	Assessment Aspects		Statement	Skor				Total Average	Valid
				1	2	3	4		
1	Compliance with the 2013 Curriculum	1	The material refers to the 2013 curriculum on solar system material				4	4	Very Valid / Eligible
		2	The material is in accordance with KD 3.7 Describing the solar system, the sun as the center of the solar system, and the position and characteristics of the members of the solar system				4		
2	Material Suitability	3	The material delivered has clear and correct references				4	4	Very Valid / Eligible
		4	The material delivered is in accordance with the cognitive abilities of students				4		
		5	The material delivered is in accordance with the facts and is true in accordance with everyday life				4		
3	Media Design	6	The material presented is presented sequentially from beginning to end				4	4	Very Valid / Eligible
		7	The material presented is in accordance with language rules				4		
		8	The material presented increases the insight and motivation of students				4		
		9	The material is easy for students to understand				4		
		10	The material is short, concise and clear so that time can be efficient				4		
			Average (Total)					4	Very Valid / Eligible

The suggestion is that the material is typed with the same font and size. The size of the letters must pay attention to the readability of the material so that students can easily read it. The material is presented with supporting images of the material that are more interesting so that it motivates students in learning. After conducting validation and getting input from the validator, the researcher conducted an evaluation and revision of the instructions/steps of the Bintarya (Solar System Bingo) game. The following are the evaluations and revisions that were conducted:

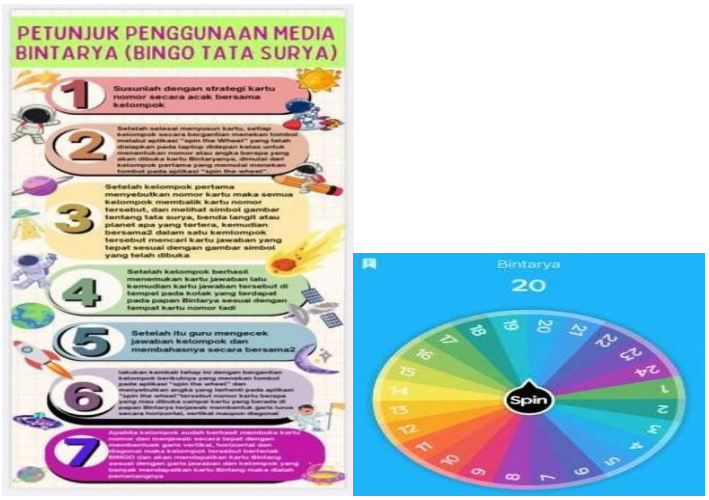

Figure 2. After being revised using the Spin The Wheel application

Figure 3. "Power Point" material after revision

Implementation Stage

The implementation stage is a real step to apply the research development that has been made. This means that at this stage everything that has been developed in such a way that it is in accordance with its role and function so that it can be implemented in implementing the Development of Bintarya Learning Media (Bingo Solar System) in the solar system of Class VI Elementary School.

Figure 4. Joint Implementation of 2 Teacher Respondents

Figure 5. Implementation of Trial of Providing Material with Students Using Bintarya Media (Solar System Bingo)

Feasibility Test
Results of Teacher Response Feasibility Assessment Instrument

The results of the teacher response feasibility questionnaire on the Development of Bintarya learning media (Bingo Solar System) on the solar system of Grade VI Elementary School conducted by 2 teachers as respondents, there are 3 aspects of indicators consisting of Learning Material Design, Operational, Visual Communication, and 10 questions that obtained the following results:

Table 10. Results of the Teacher Response Suitability Assessment Instrument

Aspect	Mean Responden 1	Mean Responden 2	Mean	Criteria
Learning Material Design	4	4	4	Very Valid / Eligible
Operational	4	3,5	3,75	Very

				Valid / Eligible
Visual Communication	3,67	3.67	3,67	Very Valid / Eligible
Total	11,67	11,17	11,42	
Mean	3.89	3,72	3,81	Very Valid / Eligible

Based on the teacher response questionnaire on the Development of Bintarya learning media (Bingo Solar System) on the solar system of Grade VI Elementary School, it shows that it is at an average of 3.81 in a percentage of 95.25% with the criteria of Very Feasible. Learning media is made based on Learning Achievements and Learning Objective Flow. In the Bintarya learning media (Bingo Solar System) on the solar system material of Grade IV Elementary School, it is calculated using the validity and reliability test which is known to be the r-table value in this study where N = 30 and sig. 0.05 of 0.361. From the results of the validity test in the table above, it is known that the feasibility variable has a value of r-count> r-table, so it can be said that all statement items in the feasibility variable are valid and can be used as a measuring tool in research. Based on the validity test above, it can be stated that it is valid and very feasible and practical to be developed. The reliability of the instrument is determined based on the cronbach's alpha coefficient. The reliability of the motivation questionnaire instrument is 0.82, thus the reliability value of the instrument has a high category (Taber, 2018). The questionnaire was given to students through teachers to collect data on student motivation towards learning the solar system. Data from the questionnaire were then analyzed using descriptive statistical methods.

Student Learning Motivation Trial

The results of the questionnaire assessing student learning motivation after using Bintarya learning media (Bingo Solar System) on the solar system material for Grade VI Elementary Schools carried out by 30 students as respondents consisting of 15 statements. It is known that the highest respondent answer is in item 3 as many as 28 or 93.3% of respondents answered strongly disagree regarding the matter of copying other people's work. This shows that the application of Bintarya learning media (Bingo Solar System) can motivate students to be independent in carrying out individual tasks and responsibilities or the application of Bintarya learning media (Bingo Solar System) can create a desire and desire to succeed in students. The final data analysis in this study used quantitative descriptive analysis in the form of values obtained from the results of the student learning motivation assessment.

Tabel.11. Description of Motivation Variables

Motivation	Frekuensi	Persentase
Low	2	6,7
Medium	27	90,0
High	1	3,3
Total	30	100,0

Based on the results of the analysis on the motivation variable, it is known that students who have low motivation are 2 people or 6.7%, medium motivation is 27 or 90%, High Frequency Motivation is 1 person or 3.3%. This can be interpreted that the implementation of Bintarya Learning Media (Bingo Tata Surya) is quite good in increasing student motivation in learning science subjects.

The results of the student response motivation questionnaire on learning activities carried out by teachers in the use of Bintarya learning media (Bingo Solar System) on the solar system material for Grade VI Elementary Schools which was carried out on 30 students as respondents. It is known that the highest respondent answer was in item 3 as many as 28 or 93.3% of respondents answered strongly disagree regarding the matter of copying other people's work. This shows that the application of Bintarya learning media (Bingo Solar System) can motivate students to be independent in carrying out individual tasks and responsibilities or the application of Bintarya learning media (Bingo Solar System) can create a desire and desire to succeed in students. The learning motivation theory used in this study is the learning motivation theory developed by Hamzah B. Uno. He said that learning motivation is divided into two groups, namely intrinsic and extrinsic motivation. The characteristics of each of these motivation groups are: (a) the desire and will to succeed, (b) the drive and need to learn, (c) the hope and ideals for the future, (d) the appreciation for learning, (e) the desire to learn, and (f) the existence of a conducive learning environment. The first three indicators are included in intrinsic motivation, while the last three are included in extrinsic motivation (Uno, 2017).

Based on the questionnaire of the feasibility of teacher responses to the Development of Bintarya learning media (Bingo Solar System) on the solar system material of Grade VI Elementary Schools, it shows that it is at an average of 3.67 in a percentage of 96.25% with very feasible criteria. The material presented in the development of Bintarya learning media (Bingo Solar System) is easy to understand so that it is easy to convey to students. The suitability between the title and discussion of the contents of the material in the development of Bintarya learning media (Bingo Solar System).

Bintarya (Bingo Solar System) is a learning media in the form of an educational game that uses a board game tool with 15 question cards and 15 answer cards and a star card Bintarya (Bingo Solar System). Where Based on the results of research and development on the development of Bintarya (Bingo Solar System) learning media, as an effort to increase the motivation of sixth grade students to learn on the solar system material, the results of analysis and data on the characteristics of Bintarya (Bingo Solar System) learning media, which are appropriate, feasible, and practical through interview activities, that the results of observations on the curriculum needs analysis component that SDN Jelambar 03 Pagi implements the 2013 Curriculum. Where learning media that contains interesting pictures and is in accordance with the original is very important to use in learning because by using picture media, it can clarify an understanding to students.

The use of image media automatically makes students pay more attention to the lesson and students are also more motivated to learn. Image media can also help teachers achieve learning goals, because images are cheap and easy to obtain media and have great benefits for increasing learning values. Because image media can provide broad understanding, impressions and experiences for students that are easy to remember and difficult to forget. (Melati et al., 2023) Some of the benefits of learning media containing images are explanations and delivery of various information, messages, ideas and so on by giving more impressions without using verbal language. Hamalik also stated that the use of learning media in the teaching and learning process can arouse new desires and interests, arouse motivation and stimulation of learning activities, and even bring psychological influences to students (Wulandari et al., 2023).

The presentation of the material contained in the development of Bintarya learning media (Bingo Solar System) attracts students' attention. The choice of words contained in the development of Bintarya learning media (Bingo Solar System) is in accordance with the material presented. The material presented in the development of Bintarya learning media (Bingo Solar System) is easy to understand, making it easier to convey to students. The suitability between the title and discussion of the contents of the material in the development of Bintarya learning media (Bingo Solar System). The presentation of material in the development of Bintarya learning media (Bingo Solar System) can attract students' interest. The material is presented with contextual examples in the development of Bintarya learning media (Bingo Solar System), which can be developed by teachers.

The presentation of materials in the development of Bintarya (Bingo Solar System) learning media attracts students' attention so that it can increase student motivation. The Bintarya (Bingo Solar System) learning media game, which was chosen in the development of Bintarya (Bingo Solar System) learning media, is appropriate. Students easily understand learning materials with the Bintarya (Bingo Solar System) learning media game, which is used in the development of Bintarya (Bingo Solar System) learning media. Learning materials allow students to learn basic competencies in a coherent

and systematic manner. Interesting learning materials can be packaged well so that the content or subject matter can become learning materials Wina Sanjaya in (Wajihan, 2023) including: a) Suitability with the objectives to be achieved b) Simplicity c) Elements of message design d) Organization of materials e) Instructions on how to use Packaging of learning materials and messages through teaching materials can be done in various ways, both visual, audiovisual or printed. With this, learning materials can be interesting for students to understand easily and can increase students' learning motivation (Djumingin & Juanda, 2022), (Novianti, G, et al., 2022).

Instructions for activities/game steps in learning presented in the development of Bintarya (Solar System Bingo) learning media are correct. Explanations of Natural Science subjects and solar system material in the form of "power points" are useful as an initial picture of students understanding the material. The suitability of the Bintarya (Solar System Bingo) game board for students with the learning material contained in the Bintarya (Solar System Bingo) learning media. Educational games in the learning process are quite challenging and activate students where students must have accuracy, competition, speed and of course make the brain continue to think. With this educational game providing learning material in a fun and exciting way, from this this educational game can make all students more interactive in the teaching and learning process. (Kompasiana, 2020). This is in accordance with (Diahratri, 2022) that learning media must be practical, flexible, and durable. Learning media that are simple and easy to use, affordable and durable and can be used continuously, add new knowledge to students and are time efficient, should be one of the main considerations in choosing learning media so that learning media can increase learning motivation.

CONCLUSION

The level of feasibility/validity of the development of Bintarya learning media (Solar System Bingo) through the ADDIE approach with the stages of analysis, design, development, implementation, and simple evaluation whose research focus is on solar system material is based on product trials in implementation, namely media expert validation tests, material expert validation tests, teacher and student response feasibility questionnaire tests, teacher and student response practicality questionnaire tests. The results of expert instruments on the Development of Bintarya Learning Media (Solar System Bingo) on Solar System Material for Grade VI Elementary Schools based on media aspects consisting of media coloring, image display, letters/words showed an average of 3.72 in a percentage of 92.5% with very feasible criteria. Based on material aspects consisting of the suitability of the material with the curriculum, the suitability of the material and the completeness of the material in the media showed an average of 4.00 in a percentage of 100% with very feasible criteria. Based on the questionnaire of the feasibility of teacher and student responses from the results of the validity test in the table above, it is known that the feasibility variable has a value of r-count> r-table. From the results of the reliability test, the Cronbach's Alpha value on the feasibility variable is 0.82. So it can be concluded that all statement items in the feasibility variable are valid and can be used as a measuring tool in research.

RECOMMENDATIONS

The recommendation is one of the one of the supporting media for the subject of science for grade VI elementary school in an effort to increase student learning motivation. The suggestion that learning should use interesting learning media can be utilized and optimized properly to improve the quality and efficiency of learning. For teachers) it is expected to be used as a reference as a learning guide, especially for solar system material in grade VI of elementary school. In addition, it can develop innovation in choosing learning media and teachers are expected to be able to be creative in developing the ability to design learning media in the learning process in accordance with the development of the times.

LIMITATION

The study was only conducted on one small group of students in one educational unit, so the results cannot be generalized to all students with different characteristics. The media trial was only conducted in a short period of time and did not cover long-term learning. This can affect the accuracy of measuring the effectiveness of the media on an ongoing basis. The study has not fully controlled external factors such as students' personal motivation, teacher influence, or learning environment that can affect learning outcomes.

ACKNOWLEDGMENTS

Thank you to the team of validators consisting of media experts and education experts who have provided insight in revising the products that have been produced.

Authorship Contribution Statement
Paramita: Conceptualization, analysis, writing.
Irdalisa: Editing/reviewing.
Ade Hikmat: statistical analysis

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