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Use Of Computer-Aided Interactive Multimedia Learning Media To Increase Learning Motivation And Mathematics Problem Solving Ability

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ABSTRACT

The success of a learning process can be seen from the level of student mastery of the material being taught. One alternative that can be done to improve students' learning motivation and mathematical problem-solving abilities is to use computer-assisted interactive multimedia learning media. This classroom action research was carried out in two cycles, namely cycle I and cycle II. Each cycle has four stages, namely planning, implementation, observation, and reflection of actions. The actions of each cycle are carried out by conveying learning objectives, motivating students, providing information, students interacting with learning using LCD/computer-assisted interactive multimedia learning projectors on comparative material, students working on LKPD and problem-solving questions, and tests are held at the end of each cycle. The conclusions obtained after the research are as follows: (1) The response of students' learning motivation to the use of multimedia is 73.64% with good criteria, (2) Students' mathematical problem-solving abilities are increasing, this can be seen from the average pretest value = 44.81, cycle I test = 55.19, and cycle II test = 64.42, and posttest = 76.92.

Keywords: Interactive Multimedia Learning Media, Motivation, Mathematical Problem Solving

INTRODUCTION

Media is a form of communication, both printed and audio-visual, and its equipment. Media should be able to be manipulated, seen, heard and read (Arief, 2020). Media is anything that is used to convey messages, can stimulate students' thoughts, feelings, interests and attention so that the learning process can run well (Arsyad, 2020). Multimedia is a new technology and an option for conveying messages. One good example is the use of multimedia in the classroom. Marsel conducted research comparing the learning process without using media with learning using multimedia (Kusumah, 2022).

The benefits that can be obtained are that the learning process is more interesting, more effective, the amount of teaching time can be reduced, the quality of student learning can be improved

and the teaching and learning process can be carried out anywhere and at any time, and students' learning attitudes can be improved (Cahyanto & Nurhayati, 2024; Ghazali et al., 2018; Iskamto et al., 2024; Manggala & Nurhayati, 2022). As one component of the learning system, the selection and use of learning multimedia must pay attention to the characteristics of other components, such as: objectives, materials, strategies, and also learning evaluation. The characteristics of learning multimedia are: a. Having more than one convergent media, for example combining audio and visual elements b. It is interactive, in the sense of having the ability to accommodate user responses. c. It is independent, in the sense of providing convenience and completeness of content in such a way that users can use it without the guidance of others (Ruseffendi, 2021).

The application of audio visual media is closely related to learning, especially for students who still lack understanding of the lesson. In this case, audio-visual media can be used as a tool to demonstrate a concept, clarify learning messages and provide more concrete explanations, apart from that, audio-visual media can also increase students' understanding because students not only listen but can also see the material displayed more clearly. varies. The success of a learning process can be determined from the level of student mastery of the material being taught. Researchers see the fact that class VII2 learning at SMP Negeri 1 Mollo Utara has not shown optimal results, as shown by the average report card results for the 2024/2025 academic year of 62.37, which is still below the school's KKM of 70.00.

Based on the results of observations, there are still many students who experience difficulties in understanding mathematical concepts, lack of student interest, lack of motivation during the learning process, students passively only listen to the teacher's information without wanting to ask about the difficulties they face, students lack practice in solving problems related to life. Everyday (contextual problems), as a result students' problem solving abilities are weak. North Mollo 1 Public Middle School has a computer laboratory room that has not been used as fully as possible, there is an internet network available but it has not been used in the learning process except for ICT lessons. Teachers have not utilized computer laboratory facilities and the internet as a source of student learning. It is rare for students to be given assignments related to the internet.

One alternative to overcome these problems in the learning process is that researchers use computer-assisted interactive multimedia learning media to increase students' learning motivation, while also utilizing computer laboratory facilities as a learning resource. For this reason, researchers conducted research entitled "Use of Computer-Assisted Interactive Multimedia as a Learning Media to Increase Motivation and Ability to Solve Mathematics Problems in Class VII2 Students at SMP Negeri 1 Mollo Utara".

LITERATURE REVIEW

Instructional Media

Media is a tool that conveys or delivers learning messages. The word media comes from the Latin medius which literally means 'middle', 'intermediary' or 'introduction'. Arsyad (2013) stated that the use of media in teaching and learning activities is a very important learning resource, because the presence of media will help students interpret certain concepts that are not or are less able to be explained using language. Gearlach & Ely say that media, when understood in broad terms, are people, materials or events that create conditions that enable students to acquire knowledge, skills or attitudes. Suparman defines media as a tool used to channel messages or information from the sender to the recipient of the message. In learning activities, media can be defined as something that can carry information and knowledge in the interactions that take place between educators and students. In reality, learning often comes into contact with things that are complex, virtual and behind reality. Therefore, media has a function to explain abstract things and show hidden things. The ambiguity or complexity of teaching materials can be helped by presenting the media as an intermediary. In fact, in certain cases the media can represent teacher deficiencies in communicating lesson material. However, the role of media will not be visible if its use is not in line with the essence of the teaching objectives that have been

formulated. Therefore, teaching objectives must be used as a reference base for using media. If ignored, the media will no longer be a teaching aid, but an obstacle to achieving goals effectively and efficiently (Lakapu et al., 2023).

Media has the meaning of medium which comes from the plural and the one in the middle in Latin. The word "medium" can be meant as "between" or "again" so that the interpretation of media can lead to something about the delivery or transmission of data (messages) between the source (message giver) and the message recipient. Ely and Gerlach stated that media is something that provides conditions to explain and help understand knowledge, attitudes and skills. It can be concluded that the media is becoming better understood as a supporting tool for explaining certain knowledge both audio-visually and verbally.

Audio visual media is an intermediary medium or the use of material and its absorption through sight and hearing so as to build conditions that can enable students to acquire knowledge, skills or attitudes. Audio visual media has a balance of elements between sound and image. This type of media has better capabilities because it includes sound and images. Like a film, a frame, there is sound and there is also an image it displays. Audio Visual can also be a communication medium. The mention of audio-visual actually refers to the senses that are targeted by the media. Audio visual media focuses on the hearing and sight of the target audience (viewers).

1. Learning Motivation

Student learning success can be determined by the motivation they have. Students who have high learning motivation tend to have high achievement, whereas if their learning motivation is low, their learning achievement will also be low. The level of motivation can determine the level of a person's effort or enthusiasm for activities, and of course the level of enthusiasm will determine the results obtained. Motivation is the term most often used to explain the success or failure of almost any complex task. Almost all experts also agree that a theory of motivation is concerned with the factors that encourage behavior and provide direction to that behavior. It is also generally accepted that a person's motive for engaging in a particular activity is based on the underlying needs (Idham Kholid, 2017).

Motivation comes from the word motive which means encouragement or reason. Motive is a driving force that encourages humans to act or a force within humans, which causes humans to act or do something. Motivation is a driving force that encourages humans to act or do something. Meanwhile, learning motivation is the overall psychological driving force within a person that gives rise to learning activities, ensures the continuity of learning activities and provides direction to learning activities in order to achieve a goal. According to Dimyati and Mudjiono (2006:80) "Motivation is seen as a mental impulse that moves and directs human behavior, including learning behavior." Motivation to learn is a condition that exists in an individual where there is an urge to do something to achieve a goal. According to Mc Donald in Kompri (2016: 229) motivation is a change in energy within a person's personality which is characterized by the emergence of affective (feelings) and reactions to achieve goals. Thus, the emergence of motivation is characterized by a change in energy within a person which can be realized or not. According to Woodwort (1995) in Wina Sanjaya (2010:250) that a motive is a set that can make individuals carry out certain activities to achieve goals. Thus, motivation is encouragement that can give rise to certain behavior that is directed towards achieving a certain goal. The behavior or actions shown by a person in an effort to achieve certain goals really depend on his motives.

As stated by Arden (1957) in Wina Sanjaya (2010: 250), the strength or weakness of the efforts made by a person to achieve a goal will be determined by the strength and weakness of the person's motives. From the definitions above, it can be said that motivation has 3 components, namely: a) needs, needs occur when an individual feels there is an imbalance between what he has and what he hopes for; b) encouragement, is a mental activity to do something; and c) goals, goals are things that individuals want to achieve. A person who has a specific goal in doing a job will do the job with enthusiasm. The influence of motivation on a person depends on how much motivation it is able to arouse someone's motivation to level up their behavior. With great motivation, a person will do work with more focus on the goal and will be more intensive in the work process. In learning activities, motivation can be said to be the overall driving force within a person that gives rise to learning activities, which ensures the continuity of learning activities and provides direction to learning activities, so that the goals desired by the learning subject can be achieved. Motivation can be divided into intrinsic motivation and extrinsic motivation (Sardiman, 2005: 189).

Intrinsic motivation is motives that become active or function without needing to be stimulated from outside, because within each individual there is already an urge to do something. Meanwhile, extrinsic motivation is motives that are active and function because of external stimuli. In line with this, Suryabrata (1994:72) also divides motivation into 2, namely: a) extrinsic motivation, namely motivation that functions because of external stimulation; and b) intrinsic motivation, namely motivation that functions even though it does not receive external stimulation. From the description above, it can be concluded that there are basically two motivations for learning, namely: motivation that comes by itself and motivation that exists due to external stimulation. These two forms of learning motivation greatly influence learning achievement. Every motivation is closely related to a goal or aspiration, so the higher the value of a goal, the stronger a person's motivation to achieve the goal (Chik & Abdullah, 2018; Lussianda et al., 2021).

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2. Efforts To Increase Learning Motivation

Efforts to Increase Learning Motivation Learning motivation is not constant, sometimes increasing and sometimes decreasing. Learning motivation should remain stable at a good level, this requires efforts to increase student learning motivation. "Efforts to increase student learning motivation include encouraging students to learn; provide realistic expectations; providing incentives; provide direction." (Slameto, 2010).

3. Learning Outcomes

The learning outcomes in question are "what students have achieved after carrying out learning activities" (Tohirin, 2011). Apart from that, learning outcomes can also be interpreted as "the result of an interaction between acts of learning and acts of teaching. From the teacher's side, the act of teaching ends with a process of evaluating learning outcomes. From the student's perspective, learning outcomes are the end of the term and the peak of the learning process," (Dimyati and Mudjiono, 2013). According to another opinion, learning outcomes are "the abilities that children obtain after going through learning activities" (Mulyono Abdurrahman, 2012; (Mahto et al., 2018; Prasetyo et al., 2024).

The results achieved by students can be in the form of abilities, both relating to aspects of knowledge, attitudes and skills possessed by students after receiving learning experiences. Factors that Influence Learning Outcomes Whether a person's learning process is successful or not is influenced by many factors, both factors originating from within the individual (internal factors), as well as factors originating from outside the individual (external factors). Recognition of the factors that influence learning success is very important in order to help students achieve the best learning outcomes. The factors that can influence student learning outcomes are as follows. Specifically, problems originating from internal factors relate to; (1) student character, (2) attitude towards learning, (3) learning motivation, (4) learning concentration, (5) ability to process learning materials, (6) ability to explore learning results, (7) self-confidence, (8) study habits. Meanwhile, external factors are influenced by; (a) teacher factors, (b) social environment, especially including peers, (c) school curriculum, (d) facilities and infrastructure, (Aunurrahman, 2012). Based on several opinions above, it can be seen that the factors that influence student learning outcomes are generally influenced by two factors, namely factors that come from within the student (internal) and factors that come from outside the student (external). One factor that comes from within the student (internal) which also influences learning outcomes is learning motivation. This shows that learning motivation plays an important role in students' learning actions.

METHOD

This research was carried out at SMP Negeri 1 Mollo Utara in the even semester from August to October 2024. The subjects of this research were 26 students in class VII2 of SMP Negeri 1 Mollo Utara, consisting of 14 boys and 12 girls. The object of this research is the use of computer-assisted interactive multimedia learning media. This type of research is Classroom Action Research (PTK). The research was carried out in two cycles, each cycle consisting of two meetings, and at the end of each cycle a test was held. Data collection techniques come from observations, interviews, tests, questionnaires, field notes and documentation.

RESULT

Classroom Research Cycle I

Before the implementation of the action using interactive computer-assisted learning LCD/projector media, students were given pretest questions that were used to determine the basic score. Students are not yet accustomed to interactive multimedia learning, students are still passively waiting for teacher instructions on how to use interactive multimedia. Students in working on LKPD and working on practice questions have not run smoothly and still need teacher guidance. The implementation of the cycle I test has not gone well, there are still many students who cheat, look at their friends' work, and ask friends. The results of the pretest scores show that no students have completed their studies, and the average pretest score is 44.81 with almost sufficient criteria. While the results of the cycle I test, there are 4 students who have completed their studies with sufficient criteria with an average of 55.19.

Classroom Action Research Cycle II. Students are able to learn to interact operating computers and follow instructions on the LCD/learning projector, teachers do not need to guide them anymore.

Students in completing LKPD have shown improvement, interest and motivation to learn and cooperative activities in groups are running smoothly. . Students in working on problem solving have improved, starting from identifying problems, planning problem solving, solving problems, and re-evaluating problem solving is done sequentially by students.. Students have started to actively ask questions with their friends and can complete LKPD and practice questions with improved results.

In the implementation of the cycle II test, there were still students who asked their friends, so the results were not optimal even though they had improved. From the results of cycle II, there were 10 students who completed learning, with an average score of 64.81, with sufficient criteria.g. After cycle II, a post-test was held consisting of 10 questions that were available in the LCD/learning projector evaluation with the results of 22 students completing learning with an average post-test score of 76.92 with high criteria

Table 1: Recapitulation of Average Test and Student Learning Completion

No		Name Test	Average Value	Amount	Learning Completion (%)

1		*Pretest*	46.81	0	0
2		Cycle Test I	56.19	4	15.38
3		Cycle Test II	66.81	10	38.48
4		*Posttest*	76.98	22	88.62

3. Questionnaire Response Analysis Results

Students The percentage of student response questionnaires regarding the use of computer-assisted multimedia learning media showed results of 73.64% with good criteria.

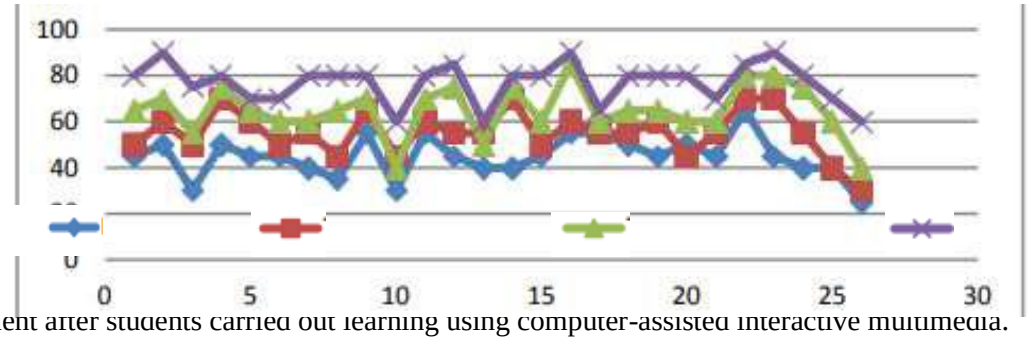
Table 2 : Student Response Questionnaire Percentage

No	Name Test	Percentage of Each Aspect (%)
1	Enjoyment and enjoyment of learning	80.77
2	Understanding of mathematical concepts	72.20
3	attitudes and interest in learning	75.55
4	student learning motivation	77.00
5	Effectiveness and time efficiency	75.12
6	Computer laboratory facilities	72.19
	Amount	445.90
	Average	75.64

1. Discussion of Research Results

Based on the research results above, it shows that there is an increase in mathematics learning outcomes, starting from the Pretest, Cycle I Test, Cycle II Test, and Posttest.

Diagram 1 : Students' Mathematics Learning Outcome Test Scores



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improvement after students carried out learning using computer-assisted interactive multimedia.

No	Problem Solving Ability Aspects	Presentation *Pretest*	Presentation Cycle I	Presentation Cycle II	Presentation *Posttest*
1	Identifying Problems	88.63	89.08	91.08	100.00
2	Planning Problem Solving	49.85	66.78	74.15	82.00
3	Problem Solving	30.00	42.15	52.62	68.54

4	Re-evaluating Problem Solving	10.77	22.77	41.38	57.15

The use of learning media with computer-assisted interactive multimedia in this study has achieved 3 main objectives in mathematics learning, namely improving the ability to solve mathematical problems, increasing student learning motivation, and increasing the development of ICT in mathematics learning, especially learning with computer-based interactive multimedia.

DISCUSSION

The integration of technology into education has transformed teaching and learning processes. One significant innovation is the use of computer-aided interactive multimedia as a learning medium. This approach combines text, images, audio, video, and interactive elements to create an engaging learning environment. This discussion explores how such tools can enhance students' learning motivation and improve their mathematics problem-solving abilities (Adeyemi, 2024; Dijkstra et al., 2011).

Computer-aided interactive multimedia learning media have revolutionized the way mathematics is taught and learned, offering innovative solutions to enhance students' learning motivation and problem-solving abilities. By integrating various elements like text, images, audio, video, and interactive components, these tools create an immersive and engaging learning experience. Features such as gamification, animations, and real-time feedback capture students' attention, making learning enjoyable and fostering intrinsic motivation. Additionally, the personalization offered by adaptive learning systems enables students to learn at their own pace, revisit challenging topics, and receive tailored feedback, building their confidence and perseverance. These platforms also leverage multisensory learning, helping students better understand and retain complex mathematical concepts through dynamic visualizations and simulations.

Moreover, interactive multimedia significantly improves mathematics problem-solving skills by providing visual representations and step-by-step guidance that demystify abstract problems. Real-time feedback helps students recognize and correct errors instantly, reinforcing their understanding and refining their approach to problem-solving. Many tools also include challenges or scenarios that require critical thinking, encouraging students to apply their knowledge creatively and develop higher-order thinking skills. However, to fully realize the benefits of these tools, challenges such as ensuring equitable access to technology, providing adequate teacher training, and balancing traditional teaching methods with digital innovation must be addressed. When implemented effectively, interactive multimedia can bridge the gap between conventional and modern education, making mathematics more accessible, engaging, and meaningful for students (Adeyemi, 2024; Efdison, 2021).

Computer-aided interactive multimedia learning media hold significant potential for enhancing learning motivation and mathematics problem-solving abilities. By making learning more engaging, personalized, and visually rich, these tools can transform the educational experience. However, successful implementation requires addressing challenges such as accessibility and teacher training. When used effectively, interactive multimedia can bridge the gap between traditional and modern teaching methodologies, fostering a deeper understanding of mathematics among students (Firdani & Al, 2023; Owenvbiugie, 2022).

CONCLUSION

Class VII2 students at SMP Negeri 1 Mollo Utara gave a positive response to the use of computer-assisted interactive multimedia learning media. Class VII2 students' learning outcomes improved after using computer-assisted interactive multimedia learning media. The ability to complete problem solving problems increases after using computer-assisted interactive multimedia learning media. Class VII2 students' learning mastery increased after using computer-assisted interactive multimedia learning media.

REFERENCES

Adeyemi, J. K. (2024). Internet Addiction and Academic Performance of Students in Nigerian Universities. International Journal of Management and Business Applied, 3(2), Article 2. https://doi.org/10.54099/ijmba.v3i2.1120

Arief, S. S. (2020). Educational Media, Definition, Development and Use. Jakarta: PT Raja Grafindo Persada.

Arsyad, A. (2020). Instructional Media. Jakarta: PT Raja Grafindo Persada.

Cahyanto, F. O., & Nurhayati, M. (2024). The Influence of Organizational Learning and Work Motivation on Employee Performance as mediated by Job Satisfaction. International Journal of Management and Digital Business, 3(1), Article 1. https://doi.org/10.54099/ijmdb.v3i1.933

Chik, Z., & Abdullah, A. H. (2018). The Role of Mediator in Relationship between Motivations with Learning Discipline of Student Academic Achievement. International Journal of Academic Research in Business and Social Sciences, 8(11), Pages 826-835. https://doi.org/10.6007/IJARBSS/v8-i11/4959

Dijkstra, M. T., Beersma, B., & Evers, A. (2011). Reducing conflict-related employee strain: The benefits of an internal locus of control and a problem-solving conflict management strategy. Work & Stress, 25(2), 167–184.

Efdison, Z. (2021). Internal Marketing Analysis and Service Quality on Student Satisfaction as Consumers. ADPEBI International Journal of Business and Social Science, 1(1), Article 1. https://doi.org/10.54099/aijbs.v1i1.29

Firdani, F. N. E., & Al, E. (2023). Contextual Aspect Of PJBL-Based Physics Module On Planetary Motion In The Solar System For 10TH Grade Students. International Journal of Educational Sciences and Development, 1(1), Article 1. https://doi.org/10.54099/ijesd.v1i1.604

Ghazali, P. L., Foziah, N. H. M., Fadzil, A. F. M., Afthanorhan, A., Mamat, M., Omar, L., Yazid, A. S., Guci, D. A., & Rashid, N. (2018). Application of integration model in education plan for learning recovery. International Journal of Engineering and Technology(UAE), 7(3.28 Special Issue 28), 182–185. Scopus.

Iskamto, D., Tresnamurti, G., & Indrajaya, D. (2024). The Influence of The Entrepreneurial Environment And Government Support on The Performance of MSMEs in Bandung. International Journal of Entrepreneurship and Business Management, 3(1), Article 1. https://doi.org/10.54099/ijebm.v3i1.969

Kusumah, Y. S. (2022). Interactive Mathematics Courseware Development Design to Improve Students' Cognitive and Affective Abilities. . Bandung: Faculty of Education and Natural Sciences, Indonesian Education University.

Lakapu, P. A., Djara, J. I., Lakapu, D. E., & Nifus, D. A. (2023). The Application Of Flip Book Media to Increasing Elementary Children's Learning Interest. International Journal of Educational Sciences and Development, 1, Article 1. https://doi.org/10.54099/ijesd.v1i1.671

Lussianda, E. O., Anggraini, N., & Febrina, L. (2021). Use of Zoom-Based Learning Media to Increase Interest in Learning During the Covid-19 Pandemic. Husnayain Business Review, 1(1), Article 1. https://doi.org/10.54099/hbr.v1i1.15

Mahto, R. V., McDowell, W. C., Kudlats, J., & Dunne, T. C. (2018). Learning Orientation and Performance Satisfaction as Predictors of Small Firm Innovation: The Moderating Role of Gender. Group Decision and Negotiation, 27(3), 375–391. https://doi.org/10.1007/s10726-018-9566-x

Manggala, I. W., & Nurhayati, M. (2022). The Effect Of Transformasional Leadership And Training On Internal Service Quality With Organizational Culture As A Mediation Variable. Adpebi International Journal of Multidisciplinary Sciences, 1(1), Article 1. https://doi.org/10.54099/aijms.v1i1.275

Owenvbiugie, R. O. (2022). Relevant Soft Skils Required By Business Education Students For Enhancing Employability. International Journal of Management and Digital Business, 1(1), Article 1. https://doi.org/10.54099/ijmdb.v1i1.343

Prasetyo, A. P., Nurhayati, M., & Mindarti, C. S. (2024). The Influence of Transformational Leadership and Intellectual Capital on Organizational Agility with Organizational Learning as a Mediating Variable. International Journal of Management and Business Applied, 3(1), Article 1. https://doi.org/10.54099/ijmba.v3i1.883

Ruseffendi. (2021). Basics of Educational Research and Other Non-Exact Fields. Semarang: IKIP Semarang.

