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The Effects of Digital Learning Media to Improve Mathematics Learning Outcomes and Motivation of Seventh Grade Junior High School Students

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Abstract: This classroom action research aims to improve learning outcomes and motivation of grade 7 junior high school students in math subjects by using digital worksheets (LKPD) as digital learning media. The research was conducted in two cycles from April 28 to May 26, 2025. Each cycle included planning, implementation, observation, and reflection stages. The research subjects were 30 seventh grade students. The data collection techniques used were motivation questionnaires and achievement tests. The research was conducted in two cycles. The motivation questionnaire was conducted in cycle 1 and cycle 2 while the achievement test was conducted in the pre- test, cycle 1, and cycle 2. The results showed that there was a significant improvement in learning outcomes and student motivation. The success in this study was characterized by student learning outcomes of at least 72 and 75% classical completeness. In cycle I, the average student score increased to 71.67 with 63.33% learning completeness. In cycle II, the score increased to 83.17 and the completeness increased to 90%. Student learning motivation also increased in a positive direction from cycle 1 to cycle 2 related to attention, relevance, trust, and satisfaction. This can be seen from the results of the questionnaire analysis given at the end of each cycle. In cycle 1 the average motivation score was 62.48 and in cycle 2 it increased to 82.71. This improvement is supported by interactive features in digital worksheets that facilitate independent and collaborative learning and flexible access that makes it easier for students to repeat the material. This study concludes that digital learning media is effective in increasing students' motivation and mathematics learning outcomes, and is suitable for student-centered learning.

***Keywords**: **Digital Learning Media, Motivation, Math Learning Outcomes, Classroom Action Research**.*

1. INTRODUCTION

Mathematics is one of the fields of science that contributes importantly to developing the ability to think logically, analytically and systematically. However, many students find this subject especially difficult in junior high school because they are still in the transitional stage of cognitive development. Furthermore, mathematics learning at the junior high school level has a variety of characteristics, learning styles, motivations, as well as the ability to use technology, which apparently has an impact on the previous mindset. Most students show low motivation in learning mathematics, which is usually reflected in passivity during lessons and unsatisfactory grades. The main factors are the perception that math is difficult and uninteresting, as well as teaching methods that do not address students' needs and interests. As a result, many students lack confidence and motivation to explore mathematical concepts. This condition is influenced by the lack of emotional support from the school and family environment, which contributes to students' tendency to feel reluctant to face mathematical challenges when learning in class.

One significant obstacle is the lack of use of interesting and innovative learning media. Without the right media, math material that tends to be abstract becomes difficult to understand and boring, so students feel that math lessons are monotonous and do not stimulate their interest in learning. Then the different characteristics of students become a big challenge in learning mathematics. Some have high mathematical concept abilities, but others have difficulty even for basic things such as counting operations, and they get bored quickly when the material is not presented in a varied way. In addition to cognitive differences, emotional factors including interest and learning conditions at home and the surrounding environment also have a significant effect. The impression that emerges is the lack of media use and teacher-centered teaching, which often demotivates students to achieve better learning outcomes. In addition, the need for in-depth reasoning to understand some things in mathematics automatically leads to a decrease in motivation.

In addition, the rapid development of information technology has changed the view of education, including teaching and learning mathematics for the better. In the digital era, teaching aids are no longer limited to textbooks and blackboards, but also include the use of digital media such as interactive learning applications, educational videos, and digital worksheets (Ningsih & Munoto, 2021). The use of digital media is said to increase teaching effectiveness as it provides a more engaging, flexible and collaborative learning experience for students.

The development of new technologies such as information and communication technology has given rise to various new learning media, one of which is using digital learning media. Learning applications, educational

videos, simulations, and online quizzes have been proven to provide a more interesting, contextualized, and more accessible learning experience for students. Putri Nursyahira et al (2023) in their research found that the use of interactive digital media in learning mathematics can increase student engagement, concept mastery, and significantly increase motivation and student learning outcomes.

This finding is in line with the meta-analysis conducted by Azkia, Muin, and Dimyati (2023), where the findings show that digital-based learning media have a strong impact on mathematics learning outcomes. This finding is a strong reason for the integration of digital media in the learning process, which in its implementation, is no longer positioned as a support, but becomes the main strategy in learning mathematics. Practice in the field shows that the application of digital media in learning does not run smoothly. Some of the obstacles that are often encountered include limited technological infrastructure in schools, lack of teacher training and digital competence, and resistance to changing traditional learning methods. However, with a systematic, participatory and sustainable approach, these obstacles can be minimized.

Instructional media in digital format such as e-worksheet (LKPD digital) which stands for Digital Learner Worksheet, is an innovation that can capture the imagination of junior high school students' minds. Interactivity and visualization increase student motivation and interest. Mathematics is one of the subjects that students find difficult, and therefore they need to be motivated to learn by using new, more innovative ways of teaching. Since some students are not very interested in the subject, the results tend to be low. Therefore, their understanding of some mathematical concepts can be done through the use of contextualized interactive digital media. In the context of learning in junior high school, digital learning media such as digital worksheets (LKPD digital) have the potential to increase student engagement through visual presentation of material, clear instructions, and interactive features that allow students to learn independently and collaboratively (Putri & Nurwahyuni, 2020). In addition, the use of digital media is in line with the characteristics of generation Z who are familiar with technological devices and have a tendency to learn through visual and multimedia media.

From the use of the above context, a classroom action research (PTK) needs to be conducted to empirically explore the use of digital learning media and learning outcomes and student motivation in Mathematics Learning. This research was carried out in two cycles and conducted through four main steps, namely planning, action, observation, and reflection, to provide a more comprehensive picture of the changes that occurred during the learning process. Therefore, this research is expected to contribute to improving mathematics learning practices that are more innovative, interesting, and relevant to the needs of the students. With the previous explanation, this research will try to answer the main question: “What is the effect of digital learning media on mathematics learning outcomes and motivation of seventh grade junior high school students?”

2. METHODS

This research is a type of Classroom Action Research (PTK) designed to improve student learning processes and outcomes in mathematics as well as student learning motivation through the use of digital learning media in the form of digital worksheets. Classroom action research can also be used to refine or improve teaching practices in the classroom. The research subjects were students of class VII SMP N 8 Tambang Kampar Regency consisting of 30 students. This research was conducted in the even semester of the 2024/2025 academic year from 28 April 2025 to 26 May 2025.

The research was conducted in two cycles, each of which has four stages in the Kemmis & McTaggart model: 1. Planning stage includes preparing lesson plans that integrate digital media learning: preparing digital media (such as learning videos, online quizzes and online group assignments); designing assessment instruments (questionnaires and learning outcomes tests). 2. Acting is implementing the mathematics lesson using digital media in accordance with the lesson plan; the teacher acts as a facilitator. 3. Observation included observing students and teachers conducting activities during the lesson; collecting data from student tests and questionnaires. 4. Reflecting so far includes analysing the results of the actions taken; whether improvements or modifications need to be made in the next cycle.

The research instruments were mathematics test questions to measure student learning outcomes; questionnaire sheets on motivation in the use of media by teachers with reference to aspects in the ARCS model, namely Attention; Relevance; Confidence and Satisfaction developed by John M. Keller in his book Motivational Design for Learning and Performance (2010), to measure student motivation. The study was considered successful

if: At least 75% of students reached the Minimum Completion Criteria (KKM) and obtained a minimum learning outcome score of 72; there was an increase in student motivation during the learning process.

3. FINDINGS AND DISCUSSION

This study was conducted in three stages, namely precycle, cycle I, and cycle II. Each stage is analyzed based on the results of learning mathematics and the level of motivation of students. Based on the results of the initial evaluation (precycle) in the form of an initial quiz conducted before the learning action is given, it is known that of the 30 students who participated in the evaluation, only 12 students (40%) who managed to achieve the minimum completeness criteria (KKM) that has been set, which amounted to 72. Meanwhile, as many as 18 students (60%) are still under the completeness limit. The learning outcomes of precycle students are presented in the following table:

Table 1. Precycle Learning Outcomes

Categories	Value Range	Number of students	Percentage	Competency Description	Completeness
Very High	90 – 100	0	0%	Very understanding and able to apply very well	Completed
Height	80 – 89	3	10%	Understand and apply the material well	Completed
Medium	72 – 79	9	30%	Enough to understand the material, meet the minimum standards (KKM)	Completed
Low	60 – 71	9	30%	There is not enough understanding, there is need for improvement	Not Completed
Very Low	< 60	9	30%	Do not understand the material, need intensive guidance	Not Completed

From the results of the table, the percentage comparison of students completed and incomplete pre-cycle is presented in Figure 1.

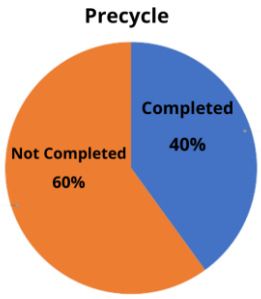

Figure 1. Comparison of Percentage of Students Completed and Incomplete Precycle

The average grade at this stage is 64.23, which shows that in general, students' understanding of statistical materials is still relatively low. This indicates that most students have difficulty in understanding statistical concepts in terms of understanding diagrams, as well as applying these concepts in problem solving.

Implementation of Cycle 1, after the application of learning media using google Forms, quizziz, and learning videos), which are shared through whatsapp groups, learning outcomes have increased. The number of completed students increased to 19 students (63.33%) and the class average to 71.67. However, there are still 11 students (36.67%) who have not reached KKM. The learning outcomes of precycle students are presented in the following table 2:

Table 2. Cycle 1 Learning Outcomes

Categories	Value Range	Number of students	Percentage	Competency Description	Completeness
Very High	90 – 100	2	7%	Very understanding and able to apply very well	Completed
Height	80 – 89	5	16%	Understand and apply the material well	Completed
Medium	72 – 79	12	40%	Enough to understand the material, meet the minimum standards (KKM)	Completed
Low	60 – 71	8	27%	There is not enough understanding, there is need for improvement	Not Completed
Very Low	< 60	3	10%	Do not understand the material, need intensive guidance	Not Completed

From the results of the table, the percentage comparison of students completed and incomplete cycle 1 is presented in Figure 2.

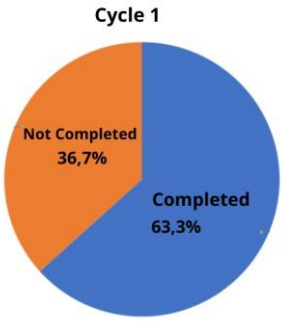

Figure 2. Comparison of percentage of students completed and incomplete Cycle 1

This learning medium allows students to learn more visually and flexibly, collaboratively, thus having a positive impact on their involvement in the learning process. This shows that the digital media used began to be effective in helping students understand mathematical material.

However, there are still 36.67% who have not reached KKM. This indicates that despite the increase, there are still a number of students who are not optimal in following the learning or are not familiar with the digital media used. Some possible causes include: students have difficulty understanding the material even though it has been presented visually; lack of motivation to learn independently outside of class hours; limited access or skills

to use digital devices. Thus, in the second cycle, corrective actions need to be taken, such as: providing more intensive assistance to students in collaborating in groups; increasing interactivity and personalization in the digital Learning media used.

After the initial intervention of learning using digital media with exercise applications and learning videos, the result of the survey was Attention: many students began to show interest due to the display of digital media in color, animation, and sound; interactive features such as live quizzes made students more focused on following the material. Relevance: students begin to understand that mathematics can be used in life, such as calculating discounts or travel time; contextual Video in digital media helps students see the relevance of the material. Confidence: some students feel more daring to try questions because there is a check answer feature. They are more confident because they know they can retry if they are wrong. Satisfaction: the sense of satisfaction increases when they manage to get a high score or badge in the application. Praise from teachers who see digital progress also has a positive impact.

The implementation of Cycle 2 which is an improvement based on the reflection of Cycle 1, with more focus on mentoring when using digital learning media in the form of digital LKPD integrated with quizziz, canva, google form, youtube, flipbook which provides an attractive visual display, makes it easier to carry out learning instructions, improve collaboration and provide quick feedback, because the results of the discussion can be directly monitored by teachers on the canva application. As a result, as many as 27 students (90%) achieved completeness, with the average value increased to 83.17. Only 3 students (10%) have not reached KKM. The learning outcomes of precycle students are presented in the following table 3:

Table 3. Cycle 2 Learning Outcomes

Categories	Value Range	Number of students	Percentage	Competency Description	Completeness
Very High	90 – 100	3	10%	Very understanding and able to apply very well	Completed
Height	80 – 89	12	40%	Understand and apply the material well	Completed
Medium	72 – 79	12	40%	Enough to understand the material, meet the minimum standards (KKM)	Completed
Low	60 – 71	3	10%	There is not enough understanding, there is need for improvement	Not Completed
Very Low	< 60	0	0%	Do not understand the material, need intensive guidance	Not Completed

From the results of the table, the comparison of the percentage of students completed and not completed cycle 2 is presented in Figure 3.

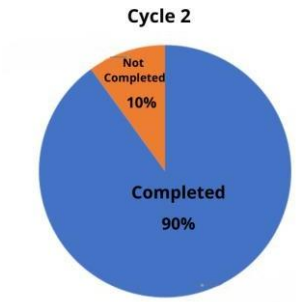

Figure 3. Comparison of percentage of students completed and not completed cycle 2

After learning using digital LKPD, the questionnaire results in cycle 2 are Attention: Many students began to show interest due to the colourful digital media display, animation, and sound; interactive features such as live quizzes made students more focused on following the material. Relevance: Students began to understand that maths can be used in life, such as calculating discounts or travel time; contextual videos in the digital media helped students see the relevance of the material. Confidence: Some students felt more courageous to try problems because of the check answer feature. They are more confident because they know they can retry if they get it wrong. Satisfaction: Satisfaction increases when they get high scores or badges in the app. Praise from teachers who see digital progress also has a positive impact. The following results of the average motivation scores of cycle 1 and cycle 2 are presented in figure 4

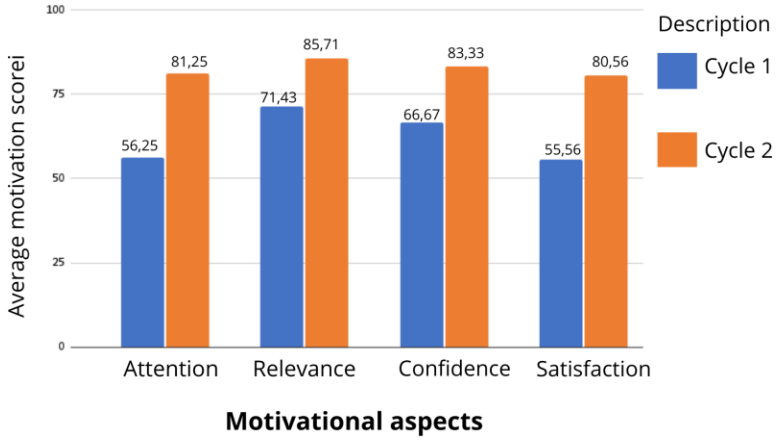

Figure 4. Comparison of Average Motivation Score in Cycle 1 and Cycle 2

The results of the average score comparison are described in the following table:

Table 4. Comparison of Average Motivation Scores

Motivation Aspects	Cycle 1	Cycle 2	Improved	Description
Attention	56,25	81,25	25,00	Increased
Relevance	71,43	85,71	14,28	Increased
Confidence	66,67	83,33	16,66	Increasedt
Satisfaction	55,56	80,56	25,00	Increased
Average	**62.48**	**82.71**	20,48	Increased

The analysis showed that the four indicators of student motivation increased from Cycle 1 to Cycle 2. In cycle 1 the average motivation score was 62.48 and in cycle 2 it increased to 82.71. This indicates that the use of digital media in learning data presentation material can significantly increase student motivation.

Some possible causes of low learning outcomes in the pre-cycle stage include: Learning approaches that have not been varied, not involving students actively in the learning process; Low student interest in learning, especially for abstract material such as statistics; Lack of use of contextual and interesting media or learning aids,

so that students have difficulty connecting material with real life; Limited time and practice questions, which causes students not to be exposed to enough variations of statistics problems. These findings become an important basis for teachers to design more effective learning strategies through classroom action, with the aim of improving students' understanding and learning outcomes in statistics.

Some of the factors that cause possible non-completion include: Difficulty understanding the material even though it is visual-based, because not all students have visual learning preferences; some may be more responsive to kinesthetic or verbal approaches (Aljohani & Davis, 2021); Lack of motivation to study independently outside of class hours, especially if students are not used to managing their time and learning rhythm independently; The digital divide, both in terms of access to devices and digital literacy, is still a challenge in various schools. This finding confirms that digital transformation in learning is not enough through the provision of digital media, but needs to be accompanied by pedagogical strategies that pay attention to student characteristics and diverse learning needs.

Several studies conducted by Kumar et al. (2020) have shown that digital media can increase students' motivation and learning achievement through the presentation of more interactive and contextualised materials. Interactive videos, in particular, can simplify abstract concepts and strengthen student understanding through dynamic visualisation. However, in cycle 1 there were still 11 students (36.67%) who had not reached the Minimum Completion Criteria (KKM). This shows that although digital media has had a positive impact in general, learning has not been optimal for all students.

Learning improvements in Cycle II were based on the results of the Cycle I reflection, which showed that some students still experienced difficulties in utilising digital learning media optimally. The problems identified included the lack of guidance during the use of digital media as well as the delay in providing feedback on the tasks they had done. Therefore, in Cycle II, teachers provided intensive assistance during the learning process using digital media and provided quick and precise feedback on students' activities and work.

Intensive assistance allows students to better understand how to use digital media, as well as reduce anxiety or confusion in following technology-based learning instructions. This is in line with the findings from Astuti & Fatimah (2022) who stated that active involvement of teachers in guiding the use of digital media can increase students' confidence and learning effectiveness. In addition, providing quick feedback is one of the key factors in improving learning outcomes. According to research by Susilowati et al. (2021), quick and specific feedback can encourage students to make immediate improvements and increase their learning motivation.

This finding strengthens the results of research from Putra & Ardiansyah (2023) which shows that the integration of digital media accompanied by teacher guidance and formative evaluation can improve student engagement and learning outcomes. Similarly, research by Wahyuni et al. (2020) emphasised the importance of adaptive pedagogical interventions in technology-based learning, especially in secondary school students.

The increase in learning outcomes from pre-cycle to cycle II shows that the use of digital media has a positive impact on the understanding of mathematics concepts, especially statistics material. Students look more active and enthusiastic when learning is done using digital media, such as animated videos and application-based interactive quizzes. This is supported by Keller's ARCS theory which emphasises the importance of attention, relevance, confidence and satisfaction in increasing learning motivation. In this study, digital media proved to be able to answer all four aspects.

This is also supported by research conducted by Sari R. N. and Zulela M. S. (2023) which states that interactive video tutorials have a significant impact on primary students' mathematics achievement. According to Azkia, Muin, and Dimyati's meta-analysis from 2023, digital media has an effect on mathematics learning. Handayani and colleagues (2022) also found that the use of Android educational apps improved students' learning and understanding of maths concepts.

During the pre-cycle phase, students were mostly passive and showed signs of boredom. In the first cycle, with the integration of digital media such as videos and app- based exercises, there was a marked increase in active participation. Students became more motivated to ask questions and engage in group discussions. In Cycle 2, almost all students actively participated; they showed enthusiasm in taking digital quizzes and working together in teams. Nur Arifah's (2021) research shows that the use of technology for teaching has a significant impact in increasing students' motivation and willingness to learn.

This approach aims to ensure that each student understands the instructions provided through digital media and can complete the tasks with more confidence and direction. Assistance is provided both classically and individually, especially to students who experience technical or conceptual problems. Quick feedback was

provided through direct comments on using the digital LKPD or class discussions, so that students could immediately correct mistakes and continue learning without significant obstacles. Overall, the implementation of active mentoring and quick feedback proved effective in improving students' learning outcomes and motivation. This confirms the importance of the teacher's role as an active facilitator in digital-based learning, especially in the context of learning mathematics at the junior high school level.

The success of this improvement was also due to the adjustment of learning strategies between cycles I and II. In cycle I, the use of digital media was still limited to presentations and simple exercises. While in cycle II, the teacher played more of a facilitator role, provided reflective guidance, and provided time for students' independent exploration through the canva application, google form and Quizizz and youtube. Support from other studies include: Zahra et al. (2022): showed that Quizizz application-based learning increased students' learning engagement and their final exam scores in maths. Hikmah & Wardani (2021): concluded that interactive video-based media improves student achievement in understanding the concepts of statistics and graphics. Putra et al. (2023): found that the use of digital media can accelerate students' adaptation process to new material due to its flexible, visual and explorative nature.

In addition to the quantitative improvement in learning outcomes, the results of student motivation questionnaires during the learning process showed an increase in positive learning behaviour. At the pre-cycle stage, most students were passive, showed boredom, and were reluctant to ask questions when experiencing difficulties. However, in cycle I, when digital learning media began to be used such as learning videos, application-based question exercises, students began to show interest. They were more active in asking questions and discussing in groups. Although not all students were enthusiastic, some began to show confidence. In cycle II, almost all students showed active involvement. This was shown by their enthusiasm for the digital quiz challenge, helping each other in groups, and increased participation in class discussions.

Increasing Motivation to Learn Based on the ARCS (Attention, Relevance, Confidence, Satisfaction) Model by Keller (2010) is an effective framework in understanding increasing student motivation: Attention: Visual and interactive digital media attracts students' attention, making them more focused in learning. Research by Rais et al. (2023) confirms that digital media can increase student engagement through a more engaging and interactive approach; Relevance: Materials that are linked to everyday life through visualisation of statistical data from students' environment increase the relevance of learning. This is consistent with the findings of Kumalasari et al. (2020) which showed that interactive learning media can increase student learning motivation by linking material to real context; Confidence: The use of applications that allow students to try and repeat exercises without fear of being wrong increases their confidence. Arliza (2019) found that Android-based interactive learning media can improve students' motivation and learning outcomes; Satisfaction: Students feel satisfied when they complete digital challenges and get rewards from both the teacher and the app.

During cycle 1: When the digital media started to be used, there was an increase in attention. Interesting visualisations and interactive features such as videos, animations and digital quizzes began to arouse students' curiosity. Students were more focused because they felt like they were playing while learning. Through digital media that contains contextualised and real-life based content, students begin to understand the connection between the material and everyday activities, such as calculating shopping money, distance or time. The immediate feedback feature and automatic evaluation system in digital media give students a sense of security. They feel free to try because there is an opportunity to correct answers without embarrassment. This increases their courage in doing problems. There is a sense of satisfaction after successfully completing the exercises in the digital media. The points feature, scores, badges and positive comments from teachers make them feel valued. This fuels the desire to keep learning and reach new targets.

During cycle 2: Students' interest was higher. Some students showed enthusiasm even before the learning started. They said they couldn't wait for their turn to use the app or answer the interactive questions. The daily challenge and leaderboard features proved effective in increasing students' focus and enthusiasm for the lesson. Relevance became more pronounced. Students enthusiastically relate the maths material to their personal activities such as online shopping, creating social media content, and managing study time. They begin to realise that mathematics is present in many aspects of their lives, and this increases the meaning of learning for them. Self-confidence increased dramatically. Students showed the courage to express their opinions, present solutions in front of the class, and give feedback to each other. Even students who were previously passive became more active in contributing because they felt that their abilities were improved and valued. Learning satisfaction is one of the main factors that strengthen students' motivation. They are proud of their achievements, whether in the form of

digital certificates, class appreciation, or recognition from friends and teachers. This encourages the formation of a growth mindset that their efforts are valuable and can lead to success.

The results of this classroom action research show that the use of digital learning media can improve both learning outcomes and student motivation in learning mathematics, especially data presentation material. The increase occurred gradually and significantly from pre-cycle to cycle II, both in the cognitive and affective aspects of students. Other things that influenced the research were: Linkage with Learning Theory: Constructivism Theory (Jean Piaget & Vygotsky), Learning with digital media creates a space for independent and collaborative exploration. When students engage in the process of searching for data, visualising graphs or answering digital quizzes, they construct their own understanding. This is consistent with Vygotsky's view of scaffolding, where teachers and media act as a buffer for learning towards the zone of proximal development (ZPD); Behaviouristic Theory (Skinner), digital learning applications often provide immediate reinforcement, such as scores, stars or badges after answering questions correctly. This positive reinforcement encourages students to keep trying without fear, a key principle in behaviourism.

This research also shows a paradigm shift in the role of teachers from knowledge transmitter to learning facilitator. Teachers no longer dominate the classroom, but design the digital learning flow, provide reflective direction, and assist when students experience technical or conceptual difficulties. Conversely, students transform from passive recipients to active learners who access materials, try, discuss and evaluate their understanding through digital quizzes. This model is in line with the 21st century learning approach that emphasises critical thinking, creativity, collaboration and communication (4C) skills.

Practical Implications of the Research Results: Maths teachers can integrate digital media as part of the learning routine, not only during the pandemic but also in normal situations. This encourages a more dynamic and participatory classroom; Curricularly: The use of digital media supports the implementation of Merdeka Curriculum which encourages differentiation of learning, utilisation of technology, and project-based learning; Psychopedagogically: Students with visual, kinesthetic and audio learning styles feel more accommodated through videos, simulations and digital exploration tasks. This increased their sense of belonging to learning mathematics. Despite the positive results, the implementation of digital media in learning still faces obstacles such as: Uneven access to devices and internet networks; Varying digital competence of teachers; Additional time needed to design effective digital media. However, with teacher training and good time management, these challenges can be overcome gradually.

4. CONCLUSION

Based on the results of classroom action research that has been carried out for two cycles, it can be concluded that the use of digital learning media has a significant positive impact on improving student learning outcomes and motivation in learning mathematics, especially in statistics material in class VII SMP. The improvement was seen gradually and consistently. At the pre-cycle stage, the student learning completeness rate only reached 40%, which indicated a low understanding of the basic concepts of statistics. After the digital learning media intervention was implemented, the completeness increased to 63.33% in cycle I, and then jumped to 90% in cycle II. The class average score also increased substantially, from 64.23 in the pre-cycle to 83.17 at the end of cycle II.

Not only from the cognitive side, the affective aspects of students, especially learning motivation, also showed positive developments. The results of the motivation questionnaire showed an increase in attention, active participation in discussions, confidence in completing tasks, and higher learning satisfaction. In cycle 1 the average motivation score was 62.48 and in cycle 2 it increased to 82.71. This shows that digital media not only serves as a means of delivering material, but also as a trigger for students' emotional and social involvement in the learning process.

This success reflects that the application of digital learning media, when combined with adaptive and student-centred learning strategies, can create a more enjoyable, relevant and meaningful learning atmosphere. Learning becomes more contextualised and interactive, encouraging students to think critically, solve problems and learn independently. Thus, digital media is not only a technological tool, but also a bridge to transformative and sustainable learning.

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