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Research Article

Implementation Of The Problem Based Learning Model Through Articulate Storyline Learning Media To Improve Students' Learning Outcomes In The Science Subject Of Grade V At Sdn Tamansari 1

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Abstract: This study examines the application of the Problem Based Learning model combined with the interactive learning media Articulate Storyline in the learning of Science on the subject of Harmony in Ecosystems in class V of SDN Tamansari 1. The background of this study is based on the low student learning outcomes caused by the dominance of the lecture method and the minimal use of interesting media, so that students are less actively involved in learning. The purpose of this study is to describe the application of the media and improve student learning outcomes. The study used the Classroom Action Research method which was carried out in two cycles, including the planning, implementation, observation, and reflection stages, with 17 students as subjects. The results showed a significant increase in student learning outcomes in each cycle, where the average class score increased from 50 in the pre-cycle to 71.17 in Cycle I, and reached 91.76 in Cycle II. The percentage of learning completion also increased from 17.65% to 76.47%, until finally reaching 100% in Cycle II. These findings indicate that the use of the Problem Based Learning model combined with Articulate Storyline can encourage student engagement and deepen conceptual understanding. Therefore, it can be concluded that the implementation of these learning models and media is effective in improving science students' learning outcomes.

Keywords: Articulate Storyline; Classroom Action Research; Ecosystem Harmony; Interactive Learning Media; Learning Outcomes; Problem Based Learning; Science.

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1. Introduction

Advances in information technology in the education sector have had a significant impact on the way teachers design and implement learning. In today's digital era, teachers are not merely sources of information, but also facilitators capable of creating interactive, contextual learning experiences that are focused on student needs (Anitasari & Utami, 2022).This situation aligns with the demands of 21st-century education, which prioritizes critical thinking, collaboration, communication, and creativity through the use of technology in learning (Suprapto, 2023). Therefore, the use of technology in the teaching and learning process is

now crucial, especially at the elementary school level (Wijaya & Putra, 2023). Teachers' ability to use learning technology also contributes to the creation of a more engaging, effective, and innovative learning process (Fadillah, 2023).

Learning Science and Social Sciences at the elementary level plays a crucial role in helping students understand natural and social phenomena comprehensively (Hadi & Novaliyosi, 2023). This learning emphasizes not only conceptual understanding but also critical thinking skills, problem-solving, and active student involvement in the learning process (Hidayah, 2024). In the subject of harmony in ecosystems, students are required to understand the interrelationships between ecosystem components as a whole, requiring a learning approach that facilitates in-depth conceptual understanding (Nugroho & Sari, 2023).

However, in practice, learning still tends to be teacher-centered through lecture methods, resulting in students being less active and experiencing difficulties in understanding the material(Iskandar, 2023). This situation gives the impression of low student academic achievement. Academic ability is the main benchmark in assessing the achievement of the learning process(Aulia, 2023). In addition, student participation in the learning process also determines success, which influences student learning success (Febrina & Setiawan, 2024). Student activeness in participating in learning activities plays an important role in helping students understand the material better and supporting maximum improvement in learning outcomes.

The use of technology in learning activities can be an effective way to improve the success of the learning process (Rahmat & Utami, 2023). Interactive learning tools such as Articulate Storyline have been proven to increase student motivation and engagement because they are able to present material in an interesting, interactive, and contextual manner (Amalia et al., 2024). On the other hand, the Problem Based Learning model allows students to learn through solving real problems, thus improving students' analytical skills and learning achievement (Sagita et al., 2023). The use of the Problem Based Learning model in elementary schools has shown positive results because it can help students improve their learning achievement while developing their thinking skills during learning activities (Sholikah & Prasetyo, 2025).

However, the use of learning media without the support of an appropriate learning model is often less than optimal in improving students' conceptual understanding (Rahmawati & Kurniawan, 2024). Conversely, the application of a learning model without the support of monotonous learning media results in students being less than optimally motivated and having difficulty grasping the content of abstract material (Pratiwi & Kurnia, 2023). Therefore, there needs to be integration between interactive learning media and innovative learning models to optimize the learning process (Saputra & Yulianti, 2024).

The main problem found in this study is the suboptimal learning achievement of fifth-grade students in science learning, especially in the subject of harmony in ecosystems. Based on the results of initial observations, this condition is influenced by the limited variety of learning strategies and the low utilization of learning media that can attract students' attention, so that students are less active and do not understand the concept optimally.

As a solution, this study proposes the application of Articulate Storyline learning media combined with the Problem Based Learning model in the form of classroom action research. This integration is expected to provide a more active and communicative learning process, contextual, and student-centered. Thus, student learning outcomes can improve, as can student understanding of concepts (Wicaksono & Fitriani, 2024).

The contributions of this research include: (1) developing learning innovations based on interactive media and Problem Based Learning, (2) increasing student learning outcomes in science learning, (3) increasing student activity and involvement, and (4) providing practical references for teachers in developing effective learning.

2. Literature review

The development of information technology has had a significant impact on education, particularly on teaching and learning activities in elementary schools. Teachers today are required to utilize technology as a learning support tool to create a more dynamic, contextual learning environment, emphasizing student engagement. In science lessons, particularly in the subject of Harmony in Ecosystems, conceptual understanding is not sufficient through mere verbal explanations; concrete visualization is essential for students to understand the relationships between ecosystem components as a whole.

However, conditions in the field show that teaching and learning activities still largely rely on traditional approaches, such as oral explanations and the use of printed media. This results in low student engagement and suboptimal conceptual understanding. This low student participation results in learning outcomes that fall below the minimum completion standard. Therefore, a variety of learning methods are needed to enhance student engagement and understanding.

One approach that can be used is the application of the Problem Based Learning model, combined with technology-based interactive learning media, such as Articulate Storyline. The Problem Based Learning model emphasizes a problem-based approach that encourages students to think analytically, collaborate, and find solutions independently. Meanwhile, Articulate Storyline media can present material in an engaging manner through a combination of text, images, animation, and interaction.

Previous research has shown that the use of interactive media and problem-based learning models can improve student engagement and learning outcomes. However, there are still limitations in optimally integrating the two, particularly in the teaching and learning of science at the elementary school level. Based on this, this study focuses on the application of Articulate Storyline media through the Problem-Based Learning model to support students' understanding of ecosystems.

Problem-Based Learning

Problem based learning is a learning process model that places students at the center of learning activities, with problems as the starting point. This approach is designed to train students in critical thinking, problem-solving, and team collaboration (Galib & Sultan, 2025).

In its implementation, Problem Based Learning is divided into several stages: problem orientation, student organization, investigation, presentation of results, and evaluation. Through these stages, students are trained to analyze problems, collect data, and develop solutions individually and in teams (Amelia & Mintohari, 2024).

The advantage of Problem Based Learning lies in its ability to create meaningful learning. Students do not simply passively acquire information but actively participate in developing their understanding through the learning process. Furthermore, this approach can enhance students' social skills, such as communication and collaboration (Sholikah & Prasetyo, 2025).

In science and science learning, the application of Problem Based Learning is highly relevant because the learning topics relate to real-life activities. By presenting cases related to their environment, students more easily understand the material in greater detail and are able to apply it to real-life situations.

Media Articulate Storyline

Learning tools are intermediaries used to deliver teaching materials from instructors to students, making the learning process more effective and efficient. In today's education, learning tools are not merely used as supporting tools but also as a vital component that can improve the quality of learning (Rachmadyanti, 2023).

Digital-based media has advantages over conventional media because it can combine various elements, including text, displays, audio, projections, and motion effects, into a single, unified medium. This provides learners with the opportunity to acquire knowledge through various types of visual, auditory, and motion-based learning.

Articulate Storylineis software used to design interactive learning tools. This platform makes it easy for teachers to create engaging learning materials with features like animations, interactive quizzes, and easy-to-use navigation (Gani, 2025). Through this platform, students can learn independently and receive immediate feedback (Dewi, 2025).

In science lessons, the use of Articulate Storyline is highly effective in helping students grasp ecosystem concepts. Visualizations presented in the form of animations and simulations can explain the relationships between ecosystem components more concretely (Nasution, 2025). This way, students not only grasp the material conceptually but also connect the phenomena occurring within their surroundings.

3. Proposed Method

This research uses a Classroom Action Research (CAR) approach focused on regularly and sustainably improving learning practices. CAR was chosen because it is aligned with the research objective of improving student learning outcomes through the application of specific learning models and media in a real-life classroom context. This strategy supports researchers in directly implementing interventions, observing their impact, and making improvements based on reflections at each cycle.

The research was conducted in two cycles, each encompassing four main steps: planning, implementing actions, monitoring, and review. During the planning stage, the researcher prepared learning materials, such as teaching modules, Articulate Storyline learning resources, and evaluation instruments. The implementation process was carried out using a problem based learning assisted approach integrated with interactive media. Subsequently, observations were conducted to observe student activities and the implementation of the learning. The reflection stage was used to evaluate weaknesses in the previous cycle as a basis for improvements in the next cycle.

This approach was determined to provide a comprehensive overview of changes that occur during learning activities. Furthermore, classroom action research also allows for gradual improvements in learning quality through repeated cycles. Therefore, this method was deemed effective for testing the use of the problem based learning model and Articulate Storyline media to improve science students' learning abilities.

Research Subjects

The study participants were 17 fifth-grade students at Tamansari 1 Elementary School. The selection of participants was purposive, based on the study's needs, focusing on improving the learning process in the classroom. Students have diverse academic abilities, ranging from low, medium, to high, providing a representative picture of the actual classroom conditions.

The diversity of student abilities is a significant consideration in this study because it allows researchers to observe the effectiveness of the implementation of learning models and media comprehensively. Furthermore, the characteristics of students who tend to remain in the concrete thinking development stage are also important reasons for using interactive learning media, as students need visualization to understand abstract concepts.

By involving all students in a single learning group, this study avoided selection bias and provided a realistic picture of learning conditions. Therefore, the results are expected to illustrate the success of the measures implemented in the context of elementary school learning.

Research Design

The study used a classroom action research model, which refers to a repetitive cycle of preparation, implementation, observation, and evaluation. The study was conducted in two cycles, each based on the evaluation results of the previous cycle.

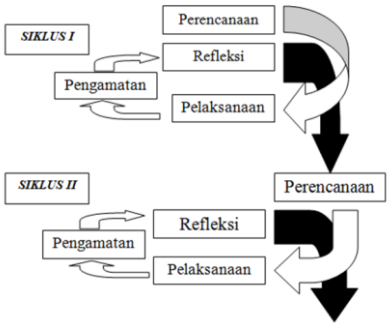

Figure 1. Classroom Action Research Design (Utami, 2022).
Source: Adapted from Kemmis & McTaggart (1988).

In Cycle I, the focus was on introducing the problem based learning model and using Articulate Storyline media in learning. The results of this cycle were then analyzed to identify any remaining weaknesses, such as a lack of student engagement or challenges in media use. Furthermore, in Cycle II, these deficiencies were addressed, both in terms of learning strategies and classroom management.

This design was chosen because it is flexible and adaptable to classroom conditions. By reflecting on each cycle, researchers can make immediate improvements, gradually improving the quality of learning. Furthermore, this design allows researchers to continuously monitor student learning outcomes.

To measure the effectiveness of the intervention, an analysis of student average scores and percentage of student learning success was used, compared between cycles. With this approach, it is hoped that the implementation of the problem based learning model through Articulate Storyline media will optimally increase student engagement and understanding.

Data Collection Techniques

Data collection in this study was conducted through several methods, including tests, observation, and documentation. These three techniques were used through triangulation to increase the validity of the data obtained.

Evaluation is used to measure students' learning abilities in terms of knowledge. Evaluation tools are developed based on established learning indicators, thus objectively measuring students' understanding of the material. Evaluations are administered at the end of each cycle to measure improvements in learning outcomes.

Observations were conducted to assess student learning behavior during the learning process. Components considered included student enthusiasm for asking questions, participation in discussions, and collaborative skills. The observation process was conducted using a previously prepared, systematic observation form.

Documentation is used as supporting information, including snapshots of activities, student work results, and notes taken during the learning process. Through various data collection methods, this research is expected to produce reliable and verifiable information in accordance with scientific principles.

Data Analysis Techniques

The data analysis in this study used both numerical and descriptive data. Numerical data were generated based on student evaluation results using average class grades and the proportion of students who passed learning activities. The average grade was used to assess the general trend of student learning outcomes, while the percentage of students who achieved the Minimum Completion Criteria was used to determine the number of students who had achieved the minimum completion criterion.

In addition, observation data was directly analyzed, presenting and describing student activities during the educational process. This observational output was used to support explanations of improvements in student learning outcomes.

Research effectiveness standards are measured based on the increase in average class scores and the achievement of collective learning outcomes. Using this analysis technique, researchers can determine the effectiveness of implementing learning models and media in improving overall student learning outcomes.

4. Results and Discussion

Research Results

Research findings demonstrate a sustained increase in student learning outcomes across each cycle of the Action phase. In the pre-cycle phase, most students still fall below the Minimum Completion. This reflects that previous instruction has not optimally met students' learning needs, particularly when understanding ecosystem material, which is difficult to visualize and requires clear visualization.

Table 1. List of Student Learning Completion.

No	Completeness	Pre Cycle		Cycle I		Cycle II	
		F	%	F	%	F	%
1.	Completed	3	17.65%	13	76.47%	17	100%
2.	Not Completed	14	82.35%	4	23.53%	0	0%
	Amount	17	100%	17	100%	17	100%

Based on Table 4.1 After the initial cycle of treatment using the problem based learning method supported by Articulate Storyline media, there was an increase in the average class score and the number of students achieving learning completion. However, the results in the first cycle were not fully optimal because several students still did not reach the minimum

completion criteria. This was due to students' adaptation process to the new learning model and their limited experience in using interactive learning media.

In the second cycle, student learning outcomes showed more striking progress, reaching the classical completion level. All students achieved the minimum completion criteria with average scores exceeding those of the previous cycle. This indicates that the interventions were effective and sustainable. Students began to become accustomed to problem-based learning patterns and were able to optimally utilize interactive media to understand the material.

Qualitatively, the improvement in learning outcomes was also accompanied by increased student activity and engagement throughout the learning process. Students demonstrated active participation in asking questions, participating in group discussions, and presenting their ideas to the class. Furthermore, students' competence in solving assigned problems also experienced significant improvement. This demonstrates that the learning implemented not only enhances intellectual aspects but also fosters student participation in critical thinking and communication skills.

From a theoretical perspective, this improvement in learning outcomes can be explained through a knowledge construction approach. In constructivist-based learning, students develop insights through active and meaningful learning experiences. The problem based learning model provides opportunities for students to directly participate in the process of finding solutions to contextual problems, allowing the knowledge gained to expand and become more lasting.

Furthermore, the use of Articulate Storyline media also contributes significantly to improving student understanding. This media is able to present material in a visual and interactive format, making previously complex ideas more concrete. This situation aligns with the foundation of digital media teaching, which explains that the combination of reading, illustration, and movement can optimize students' information absorption.

The success of learning in this study was also influenced by the integration of strategies and educational media used. The problem based learning model created a learning framework to encourage student engagement, while the Articulate Storyline media was used as supporting media to clarify the presentation of the material. This synergy created a more engaging, active, and rewarding learning environment.

Furthermore, improved learning achievement is inseparable from increased student motivation. Engaging learning media can foster student interest and reduce boredom during the teaching and learning process. Students become more enthusiastic about learning activities, especially when interacting with the media used.

Compared to the initial situation, the changes that have occurred show that the previously educator-dominated learning environment has shifted to student-centered learning activities. This situation is a dominant factor in improving the quality of learning and student achievement.

However, several obstacles were encountered during the research, such as time constraints in implementing the interventions and differences in students' abilities to adapt to digital media. Therefore, educators must be prepared to organize learning activities and provide support to students to ensure their success.

In general, the results of this study indicate that the application of the problem based learning model combined with Articulate Storyline media is considered an appropriate effort to improve students' science learning achievement. These findings reinforce the importance of technology-based learning innovation and active models in developing learning skills at the elementary level.

Discussion

This research shows that the implementation of Articulate Storyline learning media integrated with the problem based learning model has a significant impact on student learning outcomes. This improvement is not only evident quantitatively, such as an increase in average grades and percentage of students completing the course, but also qualitatively, such as increased student activity, engagement, and critical thinking skills during the learning process.

Quantitatively, the improvement in learning outcomes from the pre-cycle to the second cycle indicates that the interventions implemented in this study were effective and sustainable. In the first cycle, the improvement was still in its early stages as students were adjusting to the new learning system. Meanwhile, in the second cycle, the more significant improvement

indicated that students were able to follow the problem-based learning process more optimally.

From a theoretical perspective, these findings align with the constructive approach, which suggests that understanding is formed independently by learners through learning activities. The problem based learning model provides opportunities for students to directly participate in finding solutions relevant to real-life situations, making learning more meaningful. Students not only acquire material but also process and apply that knowledge in real-life situations.

The use of Articulate Storyline also makes a significant contribution to improving student understanding. This medium presents material in engaging visuals, animations, and interactions, ultimately making previously abstract concepts clearer. Multimedia learning suggests that the combination of text and visuals can increase student retention and strengthen understanding.

The success of the learning process in this study was also inseparable from the appropriate integration of learning models and media. The problem based learning model played a role in developing student-centered learning activities, while the Articulate Storyline media was used as a supporting tool to clarify the material. The combination of the two created a much more interactive, engaging, and effective educational environment.

Furthermore, improvements in learning outcomes were driven by increased student motivation. Interactive learning media captures students' attention and reduces boredom during teaching and learning activities. Students demonstrated a stronger enthusiasm for learning, especially when interacting with quizzes and simulations. This demonstrates that students' intrinsic motivation contributes to learning success.

Referring to the findings, it appears that learners are becoming increasingly engaged in asking questions, discussing, and expressing opinions. This situation indicates that the learning activities implemented can create a collaborative learning environment. These activities also contribute to increasing students' sharp reasoning and problem-solving abilities.

As reinforcement, the use of interactive media in this learning also encourages deeper information processing. Students don't just silently absorb the material but actively participate in exploring and understanding it. This phenomenon results in increased student retention and understanding of the ecosystems content.

Furthermore, the implementation of the Problem Based Learning model can accommodate differences in student abilities. Students with limited understanding receive support through group work, while those with advanced understanding can develop their thinking in more complex ways. This makes learning more inclusive and adaptive.

Compared to the initial conditions, there has been a significant improvement in the transition from teacher-oriented to student-oriented learning. This change is a key factor in optimizing the quality of learning activities.

However, the study encountered several obstacles, including the limited number of participants, which prevented the findings from being fully applicable to a broader context. Furthermore, the study, conducted in both cycles, was unable to describe the long-term effects of using this learning model and media. Other factors, such as educator competence in organizing learning activities based on digital devices, also influence the success of implementation.

Therefore, future research is recommended to include a larger participant population, extend the study period, and analyze other aspects of student motivation, critical analytical skills, and attitudes. Furthermore, educator development in digital technology utilization needs to be strengthened to ensure optimal implementation of technology-based learning.

5. Conclusions

Based on the results of the classroom action research and the discussions that have been conducted, it can be concluded that the implementation of the Problem Based Learning (PBL) model assisted by Articulate Storyline learning media was effective in improving the learning process and learning outcomes in science subjects, particularly on the topic of harmony in ecosystems at SDN Tamansari 1. The application of the PBL model encouraged students to become more active in discussions, ask questions, and participate in problem-solving activities during the learning process. In addition, the use of Articulate Storyline interactive media helped students understand ecosystem concepts more clearly through visual and interactive presentations, which increased their motivation and engagement in learning activities.

Furthermore, the integration of the Problem Based Learning model with Articulate Storyline media significantly improved students' learning outcomes. This improvement was reflected in the increase in average class scores from the pre-cycle stage to Cycle I and continued to improve in Cycle II, where most students achieved the minimum mastery criteria. The implementation of innovative learning models and interactive digital media also created a more student-centered learning environment, enabling students not only to improve academically but also to develop critical thinking, collaboration, and communication skills throughout the learning activities.

Based on these findings, teachers are encouraged to optimize the use of interactive digital learning media such as Articulate Storyline and continue implementing student-centered learning models, including Problem Based Learning, to promote active participation, critical thinking, and collaborative learning. Teachers are also advised to enhance their digital teaching competencies through continuous training and professional development. For future researchers, it is recommended to conduct similar studies with a larger number of participants and a longer research duration to obtain more comprehensive findings. Further research may also explore additional variables related to student learning, such as learning motivation, critical thinking skills, creativity, and students' attitudes toward digital learning media.

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