

Improving student learning activeness through a differentiated learning approach using the project-based learning model

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ABSTRACT

This study aims to improve students' learning activeness in the IPAS subject through the implementation of a differentiated learning approach using the Project-Based Learning (PjBL) model in Grade V of SDN 126/VI Muara Jernih. The method employed was Classroom Action Research (CAR) based on the Kemmis and McTaggart model, conducted in two cycles with 24 students as research subjects. Data were collected through observation, interviews, documentation, and learning outcome tests, then analyzed using descriptive qualitative and quantitative methods. The results of the study indicate an increase in students' learning activeness from 64% in Cycle I to 81.28% in Cycle II. Improvements occurred across all activity indicators, including visual, oral, listening, writing, and motor activities. The implementation of project-based differentiated learning was proven effective in creating participatory, meaningful, and student-centered learning.

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Introduction

Education plays a central role in human life as it functions as a means for developing individual potential, shaping character, and improving the quality of human resources. Through education, individuals are guided to develop skills, build knowledge, and form personalities that are prepared to face the challenges of the times. In this process, the role of teachers as learning facilitators and the availability of adequate learning resources become important elements that support the achievement of educational goals (Maulidina et al., 2024).

In the context of 21st-century learning, the education system is required to prepare students to adapt to global developments through the mastery of literacy, numeracy, and critical thinking skills (Deni, 2025). This condition necessitates an effective and participatory learning process that involves meaningful learning experiences through contextual strategies. In accordance with the Regulation of the Minister of Education, Culture, Research, and Technology (Permendikbud Ristek) No. 16 of 2022 concerning Process Standards, learning should be designed to provide high-quality learning experiences through the application of materials in real-life contexts that encourage active student participation.

Effective learning requires the active involvement of students, both physically and mentally, in various learning activities. This activeness includes visual, oral, listening, writing, and motor activities (Uno & Mohamad, 2022). Learning activeness is an important indicator in measuring learning success because it reflects the extent to which students are actively involved and responsible for their own learning process.

One form of curriculum implementation that supports active student engagement is the subject of Natural and Social Sciences (IPAS). IPAS integrates elements of natural sciences and social sciences into a unified thematic learning approach aimed at building students' understanding of natural and social phenomena in their surroundings (Kiska, Haryanto, & Indryani, 2024). IPAS learning not only functions to improve students' literacy and numeracy but also aims to shape the character of Pancasila students who are curious, think critically, and are able to solve problems in real-life contexts.

However, based on observations conducted at SDN 126/VI Muara Jernih, problems were found related to the low level of learning activeness among fifth-grade students in IPAS learning. Students' activeness in various aspects of learning activities was still relatively low, such as lack of focus when the teacher explained the material, minimal courage to ask and answer questions, delays in completing assignments, and insufficient readiness to participate in learning activities. This indicates that the ongoing learning process has not been able to optimally encourage active student participation.

Furthermore, the learning methods used by teachers were still conventional, namely lectures and worksheet-based assignments. This caused students to feel bored and less interested in the IPAS subject. The results of interviews with students showed that they preferred interactive learning that involved group discussions and hands-on practical activities. Therefore, an approach and learning model are needed that can accommodate the diverse learning needs of students.

One alternative solution that can be applied is the use of the Project-Based Learning (PjBL) model combined with a differentiated learning approach. The PjBL model emphasizes project-based learning activities oriented toward final products, where students are given the freedom to design and carry out their own projects (Irayana & Assyauqi, 2024). This encourages students to actively construct knowledge and enhances critical thinking and collaboration skills. Meanwhile, the differentiated learning approach provides opportunities for teachers to adjust learning strategies based on differences in students' abilities, interests, and needs (Novianti, 2025).

Previous research by Puspitasari, Reffiane, and Azizah (2025) showed that the implementation of the PjBL model was able to increase students' activeness, creativity, and critical thinking skills in mathematics learning. Another study by Fadhilah and Nuroso (2024) also proved that the PjBL model could improve students' creativity and activeness through contextual and project-based approaches. Thus, the application of the PjBL model combined with a differentiated learning approach is believed to be able to overcome the problem of low student learning activeness at SDN 126/VI Muara Jernih.

Based on the above description, the researcher is interested in conducting a study entitled: "Improving Students' Learning Activeness through a Differentiated Learning Approach Using the Project-Based Learning Model in the IPAS Subject for Grade V at SDN 126/VI Muara Jernih."

Method

This study employed a Classroom Action Research (CAR) approach referring to the Kemmis and McTaggart model. This model consists of four stages: planning, action implementation, observation, and reflection (Utomo, Asvio, & Prayogi, 2024). Each stage is designed to provide continuous improvement to the learning process. The research was conducted over two cycles, with one meeting in each cycle. The purpose of this study was to

observe improvements in students' learning activeness after the implementation of a differentiated learning approach using the Project-Based Learning (PjBL) model.

The subjects of this study were 24 fifth-grade students of SDN 126/VI Muara Jernih in the 2024/2025 academic year. The research was carried out during the even semester in the Natural and Social Sciences (IPAS) subject. The selection of this class was based on initial observations indicating low levels of student activeness and participation in learning activities. Therefore, the implementation of the Project-Based Learning model with a differentiated learning approach was expected to serve as a concrete solution to enhance student engagement and optimize their learning potential in accordance with individual differences in abilities and interests.

Research data were collected through observation, interviews, documentation, and learning outcome tests. The research instruments included teacher and student observation sheets, learning activeness questionnaires, and learning evaluation tests. Observation sheets were used to record students' activities, interactions, and collaboration during the project-based learning process. The learning activeness questionnaire was used to measure students' levels of participation, initiative, and responsibility before and after the implementation of the Project-Based Learning model (Sulifah, Nuryatin, & Mursidik, 2025). Evaluation tests were used to determine improvements in learning outcomes and understanding of IPAS concepts after the learning actions were implemented.

Data analysis was conducted using descriptive quantitative and qualitative methods. Quantitative data were obtained from observation results, questionnaires, and tests, which were analyzed by calculating average scores, percentages of improvement, and comparing results before and after the intervention. Meanwhile, qualitative data from observations and interviews were used to describe changes in learning behavior, social interaction, and student activeness during the project-based learning process. Data validity was ensured through technique and source triangulation to confirm the credibility of the collected data (Husnullail & Jaiani, 2024).

The results of the analysis served as the basis for reflection, which aimed to improve and refine the actions in the subsequent cycle. Through this approach, it is expected that the effectiveness of differentiated learning using the Project-Based Learning model in enhancing students' learning activeness in the IPAS subject for Grade V at SDN 126/VI Muara Jernih can be determined.

Result

Notes or observations taken at the end of each meeting served as the basis for presenting the research findings. The purpose of this classroom action research was to answer the research questions that became the focus of each cycle, each of which consisted of two meetings (Tanjung et al., 2024). To determine the extent to which the implementation of a differentiated approach using a project-based learning model improved students' learning activities in science and technology materials in Grade IV of State Elementary School 31/IV, Jambi City, data from teacher reflections and observations were collected from each meeting in every cycle of this study.

The researcher began the classroom action research (CAR) in Cycle 1, Meeting 1, to examine how project-based learning and differentiated instruction were used to enhance student engagement with the science and technology curriculum on the topic of Indonesian cultural diversity.

Planning:

Surveying the class that would become the research subject was the initial step in planning the study in order to identify problems related to students' perceptions and the learning process in the classroom (Susanto et al., 2025). At this stage, the researcher prepared all educational resources to be used during the learning process. These activities included collecting teaching materials, learning media, and various supporting resources relevant to the learning topic. In addition, the researcher also prepared observation sheets for learning activities, which were used to monitor the activities of teachers and students during the implementation of the action. All of these preparations were carried out to ensure that the learning implementation could run effectively, systematically, and in accordance with the research objectives.

Cycle I

Meeting I

This meeting was held on Monday, September 8, 2025. The learning activities took place at SDN 126/VI Muara Jernih for two lesson hours (2×35 minutes), from 08:00 to 09:30. Since the differentiated approach focuses more on fulfilling students' learning needs, the teacher needed to identify students' learning interests before starting the teaching and learning activities. This observational approach was applied by directly observing students while they were completing their daily learning tasks.

Introduction

Learning began with the teacher greeting the students, inviting them to pray together before starting the lesson, and recording attendance. The teacher then prepared students to begin learning by distributing materials related to the learning process. Textbooks, notebooks, and other printed materials helped students observe by presenting images or other materials related to environmental diversity. The instructor then explained the learning objectives for the science lesson and the science topic "Food Chains."

Core Activities

The teacher and students determined essential questions in the first stage of the core activities. The teacher provided a learning video to help students identify these questions. After watching and listening to the broadcast, students and the teacher engaged in a question-and-answer session. In addition, students received various examples of materials (differentiated content) from their surrounding environment. After explaining and encouraging students to share ideas or ask relevant questions, the instructor provided clarification and support.

In the second stage, the teacher divided students into four groups to develop product planning; these groups were formed based on students' needs rather than randomly. The instructor then distributed worksheets to be completed collaboratively. The teacher guided and assisted students while each group discussed the creation of products related to diversity content. In front of their classmates, each student group then explained the product they intended to create.

Product differentiation is a practice that allows students to create freely designed products as long as they are relevant to the learning material (Nasrodin et al., 2025). In the third stage, namely scheduling, students and their groups created a production schedule for Wednesday, or two days after the schedule was determined. Students divided tasks and prepared the necessary resources. After all decisions were made, students collaborated to complete the provided student worksheets (LKPD).

Closing

After asking the class to collaborate in completing the assigned readings and products, the instructor invited them to exchange greetings and recite a prayer to conclude the lesson.

Meeting II

The second meeting in Cycle I was conducted on Wednesday and lasted for two learning sessions, each with a duration of thirty-five minutes. At this meeting, learning activities focused on improving the learning process that had been planned in the previous meeting. Students worked in groups according to the project design that had been prepared, while the teacher acted as a facilitator, providing guidance and direction during the product creation process.

Planning

In planning this second meeting, the researcher improved aspects of the learning process that had been obstacles in the first meeting, including:

- Preparing the learning tools to be used.
- Preparing the necessary learning resources, materials, and media.
- Preparing observation sheets for learning activities.

Implementation

The meeting was held on Wednesday. The learning session lasted for two lesson hours (2×35 minutes) at SDN 126/VI Muara Jernih, from 08:00 to 09:30 WIB.

Introduction

The teacher greeted the students, asked about their condition, recorded attendance, and then prepared the class for the lesson by conducting perception exercises and giving differentiated instructions according to each student's needs. The initial activity included greeting students and inviting them to pray together before the lesson began.

Core Activities

The steps for making objects using the provided materials and tools had been discussed in the core activities of the previous meeting and were continued in this meeting. The teacher instructed students to prepare everything, including group seating, supplies, and equipment. Once everything was ready, the instructor asked students to begin creating the final product. The instructor supervised each group as they worked on the project and offered assistance when needed.

The teacher observed each student while they worked on the project and completed tasks. The instructor observed each student's active learning process and used this information to measure how active the students were. After students completed their products, the teacher and students listened to presentations of each group's product. Other groups were then given the opportunity to ask questions and provide feedback on each presented product.

Closing

After asking the class to collaborate in completing the assigned readings and products, the instructor asked them to say greetings and recite a prayer to conclude the lesson.

Table 1. Percentage Results of Students' Learning Activities in Cycle I

No	Indicator	Sub-Indicator	Observation Results		Average
			Meeting 1	Meeting 2	
1	Visual activities	Paying attention to the teacher's explanation when delivering the material	62.11	74.74	68.42
2	Oral activities	Expressing opinions, answering questions, asking questions, and discussing with group members	63.16	66.32	64.74
3	Listening activities	Listening to directions or explanations from the teacher and paying attention to the presentation of discussion results or presentations from other groups	60.00	62.11	61.05
4	Writing activities	Taking notes on lesson material and completing assigned tasks during the learning process	62.11	65.26	63.68

5	Motor activities	Participating in conducting experiments or projects	60.00	64.21	62.11
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Based on the table above, it can be seen that students' learning activeness in Cycle I using a differentiated learning approach with the Project-Based Learning (PjBL) model in Grade V IPAS learning on the topic of food chains showed improvement.

The first indicator, in which students paid attention to the teacher's explanation when delivering the material, reached 62.11% in the first meeting and 74.74% in the second meeting, resulting in an average of 68.42%. The indicator of expressing opinions, answering questions, asking questions, and discussing with group members obtained a percentage of 63.16% in the first meeting and 66.32% in the second meeting, resulting in an average of 64.74%. The next indicator—listening to directions or explanations from the teacher and paying attention to the presentation of discussion results or presentations from other groups—achieved 60.00% in the first meeting and 62.11% in the second meeting, with an average of 61.05%. The subsequent indicator, namely taking notes on lesson material and completing assigned tasks during the learning process, reached 62.11% in the first meeting and 65.26% in the second meeting, resulting in an average of 63.68%. Participation in conducting experiments or projects achieved 60.00% in the first meeting and 64.21% in the second meeting, resulting in an average of 62.11%.

Based on the data in the table above, it can be concluded that each indicator of students' learning activeness increased from the first meeting to the second meeting. However, the improvement has not yet shown significant results; therefore, further efforts are still needed through improvements in learning strategies in the next cycle so that students' learning activeness can increase more optimally.

Cycle 2

Meeting 1

Based on the reflection from Cycle I, several aspects of students' activeness began to improve in the IPAS learning process on the topic of food chains in Grade V through the use of a differentiated approach with the Project-Based Learning (PjBL) model. However, to further enhance students' learning activeness during the learning process, the researcher conducted Cycle II with two meetings held on Monday, September 15, 2025, from 08:00 to 09:30 WIB, with a time allocation of 2×35 minutes for each meeting.

Introduction

Learning began with the teacher greeting the students, inviting them to pray together before starting the lesson, and recording attendance. The teacher then prepared the class to begin learning by organizing resources related to the learning process, such as textbooks, notebooks, pens, and other materials, as well as conducting apperception activities. Next, the teacher explained the learning objectives to be studied in the IPAS subject on the topic of "Food Chains."

Core Activities

The main task in the first stage involved the teacher and students determining fundamental issues. The teacher provided stimulation to students by playing a learning video during this process. After watching and listening to the video, students and the teacher engaged in a question-and-answer session. In addition, students received various examples of materials (differentiated content) from their surrounding environment. After explaining and encouraging students to share ideas or ask relevant questions, the instructor offered clarification and support. To teach the material, the instructor and students designed three types of games: guessing the environment, whispering, and predicting situations. Students' learning demands (process differentiation) encouraged the creation of these games in such a way that students could easily understand the material presented during learning.

The teacher and students were divided into three groups based on students' needs in the second step, namely developing product planning. The instructor then distributed worksheets

to be completed collaboratively by the class. The teacher guided and assisted students while each group discussed the creation of products related to diversity content. After that, each student group presented their final work to their classmates. As long as it was related to the learning material, each product created by students was flexible; this is known as product differentiation.

Students and their groups prepared a production schedule on Monday as part of the third step of scheduling. Students divided tasks and prepared the required resources. After reaching an agreement, students collaborated to complete the provided student worksheets (LKPD).

Closing

After asking the class to collaborate in completing the assigned readings and outcomes, the instructor asked them to exchange greetings and recite a prayer to conclude the lesson.

Meeting 2

The second meeting of Cycle I was held on Wednesday and lasted for two sessions, each with a duration of thirty-five minutes. Students were instructed to create the products that had been planned during this second meeting.

Planning

This study investigated the educational institution that served as the research subject to identify problems related to students' perceptions and the classroom learning process. At this stage, the researcher carried out several important activities as part of the preparation for implementing the action, including preparing the teaching materials to be used during the learning process, providing the necessary resources, equipment, and educational media to ensure that teaching and learning activities could run effectively, and preparing observation sheets to record the activities of teachers and students during the learning process. All of these preparations were undertaken to ensure that the research could be conducted systematically, in a well-directed manner, and in accordance with the intended objectives.

Implementation

The meeting was conducted on Wednesday. The two-hour class session (2 × 35 minutes) took place at SDN 126/VI Muara Jernih from 08:00 to 09:30 WIB.

Introduction

The initial activities included greeting the class, inviting students to pray together before the lesson began, asking about their well-being, and recording attendance. After that, the teacher prepared the class for learning and applied differentiation to meet the needs of each student.

Core Activities

The steps for creating the work products using the provided materials and tools had been discussed in the core activities of the previous meeting and were continued in this meeting. The teacher instructed students to prepare everything, including group seating arrangements, supplies, and equipment. Once everything was ready, the instructor asked students to begin creating the final product. The instructor supervised each group as they worked on the project and offered assistance when needed. The instructor observed each student while they worked on the project and completed their assigned tasks. The instructor also observed each student's active learning process and used this information to measure the level of student activeness.

After students completed their products, the teacher and students listened to presentations of each group's product. Other groups were then given the opportunity to ask questions and provide comments on each presented product.

Closing

After asking the class to collaborate in completing the assigned readings and products, the instructor asked them to exchange greetings and recite a prayer to conclude the lesson.

Table 2. Percentage Results of Students' Learning Activities in Cycle II

No	Indicator	Sub-Indicator	Observation Results		Average
			Meeting 1	Meeting 2	

1	Visual activities	Paying attention to the teacher's explanation when delivering the material	78.12	82.25	80.19
2	Oral activities	Expressing opinions, answering questions, asking questions, and discussing with group members	79.13	83.64	81,34
3	Listening activities	Listening to directions or explanations from the teacher and paying attention to the presentation of discussion results or presentations from other groups	81.05	82.11	81.58
4	Writing activities	Taking notes on lesson material and completing assigned tasks during the learning process	80.15	83.15	81.65
5	Motor activities	Participating in conducting experiments or projects	80.00	83.25	81.63

The first indicator, in which students paid attention to the teacher's explanation when delivering the material, achieved 78.12% in the first meeting and 82.25% in the second meeting, resulting in an average of 80.19%. The indicator of expressing opinions, answering questions, asking questions, and discussing with group members obtained 79.13% in the first meeting and 83.63% in the second meeting, resulting in an average of 81.34%. The next indicator—listening to directions or explanations from the teacher and paying attention to the presentation of discussion results or presentations from other groups—achieved 81.05% in the first meeting and 82.11% in the second meeting, with an average of 81.58%. The subsequent indicator, namely taking notes on lesson material and completing assigned tasks during the learning process, reached 80.15% in the first meeting and 83.15% in the second meeting, resulting in an average of 81.65%. Meanwhile, the indicator of participating in conducting experiments or projects achieved 80.00% in the first meeting and 83.25% in the second meeting, resulting in an average of 81.63%.

Table 3. Students' Activeness in the Learning Process

Indicator	Sub-Indicator	Cycle I	Cycle II	Improvement
Visual activities	Paying attention to the teacher's explanation when delivering the material	68.42%	80.19%	11.77%
Oral activities	Expressing opinions, answering questions, asking questions, and	64.74%	81.34%	16.6%

	discussing with group members			
Listening activities	Listening to directions or explanations from the teacher and paying attention to the presentation of discussion results or presentations from other groups	61.05%	81.58%	20.53%
Writing activities	Taking notes on lesson material and completing assigned tasks during the learning process	63.68%	81.65%	17.97%
Motor activities	Participating in conducting experiments or projects	62.11%	81.63%	19.52%

The tables above present a summary of the improvement in students' learning activeness during the learning process through the use of a differentiated approach and the Project-Based Learning model on the topic of food chains in Grade V. The data are presented in the form of a graph, as follows:

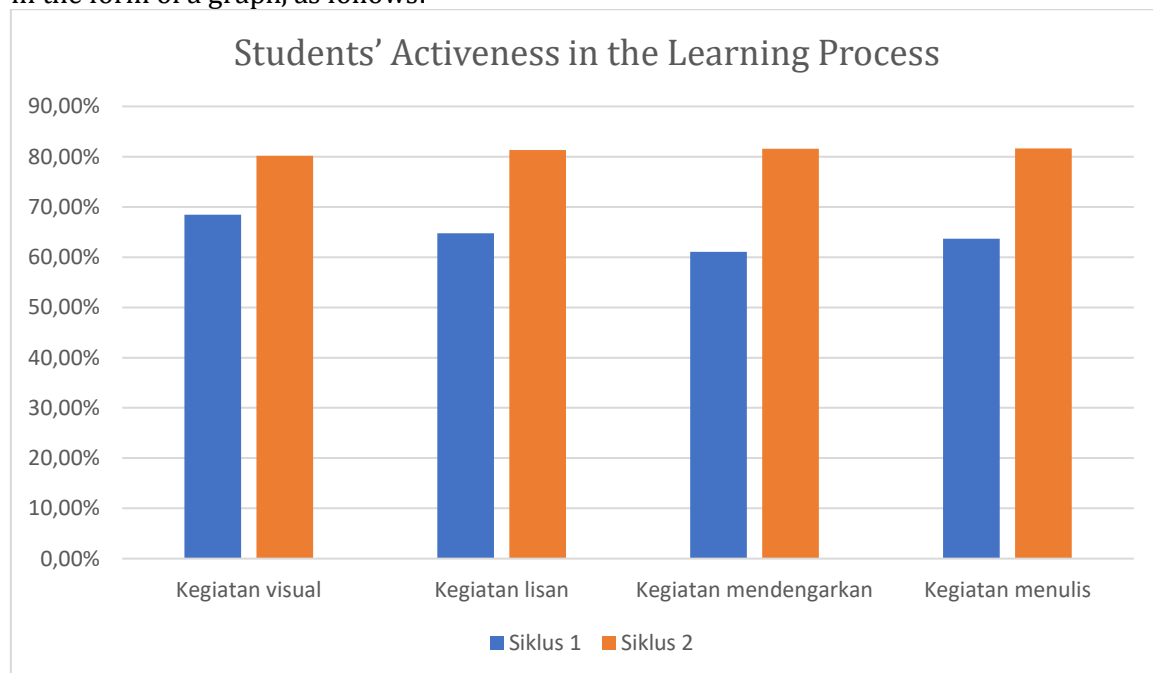


Figure 1. Diagram of the Increase in Students' Activeness in Learning

Based on the data above, students' learning activeness increased in Cycle II. The first indicator, in which students paid attention to the teacher's explanation when delivering the material, achieved 68.42% in Cycle I and 80.19% in Cycle II, resulting in an increase of 11.77%. Meanwhile, the indicator of expressing opinions, answering questions, asking questions, and discussing with group members obtained 64.74% in Cycle I and 81.34% in Cycle II, showing an increase of 16.6%. The next indicator, in which students listened to directions or explanations from the teacher and paid attention to the presentation of discussion results or presentations from other groups, achieved 61.05% in Cycle I and 81.58% in Cycle II, resulting in an increase of 20.53%. The subsequent indicator, namely taking notes on lesson material and completing assigned tasks during the learning process, obtained 63.68% in Cycle I and 81.65% in Cycle II, showing an increase of 17.97%. Meanwhile, the indicator of participating in conducting

experiments or projects achieved 62.11% in Cycle I and 81.63% in Cycle II, resulting in an increase of 19.52%.

Based on the results of the research conducted by the researcher in Cycle I and Cycle II to improve students' activeness in the learning process at SD Negeri 126/VI Muara Jernih, the data analysis shows an increase in students' learning activities between Cycle I and Cycle II through the implementation of a differentiated learning approach using the Project-Based Learning (PjBL) model. In each cycle, an improvement occurred. Based on the results obtained, the average observation score in Cycle I was 64%, while in Cycle II it increased to 81.28%.

Discussion

The increase in students' learning activities was caused by improvements in the teaching and learning process carried out by the teacher, from the initial stage to the final stage. The improvement in students' learning activeness occurred as a result of enhancements in the instructional process implemented by the teacher, beginning at the introduction of the lesson and continuing through to its conclusion. As a result, during the learning process, students showed great enthusiasm in participating in the activities. In addition, it was evident that students engaged more frequently in discussions and were more focused on the learning material. At the final stage of the learning activities, students were able to work independently, which enabled them to better understand the material being studied.

The improvement in students' learning activities occurred because the teacher made refinements to the learning process, starting from the introductory phase through to the closing phase. These improvements made students more enthusiastic during discussions, more actively involved in collaborative activities, and more focused on the material being taught. At the end of the learning activities, students were also able to work independently, resulting in better understanding of the material. Based on these findings, it can be concluded that the implementation of a differentiated learning approach and the Project-Based Learning model contributed to the improvement of students' learning activities. In the implementation of differentiated learning, there are four main components: content differentiation, process differentiation, product differentiation, and the learning environment. However, the three core components of differentiated learning are content differentiation, process differentiation, and product differentiation. The explanations of these three components are as follows:

Content Differentiation

Teachers differentiate science learning content by adjusting the material to suit students' abilities and needs. Content differentiation does not mean that each student receives different material; rather, teachers adjust the methods of delivery and learning materials so that they are easier to understand (Amalia, 2024). Teachers also analyze students' learning readiness, connect new material with prior knowledge, and provide reading materials or additional resources that are appropriate to students' levels of understanding.

Process Differentiation

Process differentiation refers to how teachers organize the ways students interact with learning materials according to their learning styles and preferences (Trisnani et al., 2024). The goal is to ensure that each student's learning needs are well accommodated. According to Gregory and Chapman, accommodating learning means designing learning activities that actively engage students through direct experiences such as practice, games, demonstrations, and modeling. In addition, the learning process is not only conducted individually but is also designed to allow students to learn collaboratively in groups.

Product Differentiation

Products in learning reflect the level of students' mastery of the material. Product differentiation provides opportunities for students to demonstrate their learning outcomes in various ways according to their abilities and creativity, such as reports, brochures, or projects.

In mathematics learning, teachers can provide variations and challenges so that students are able to demonstrate their conceptual understanding through the work they create.

Based on the results of this study, it can be concluded that the implementation of a differentiated learning approach is able to improve students' learning activeness through its three main components: content differentiation, process differentiation, and product differentiation. Differentiated learning is effective when students experience several important conditions in the classroom. First, students are able to achieve all learning objectives. In mathematics subjects, the application of differentiated learning helps students understand the material more easily and achieve better learning outcomes than before. Second, students obtain learning outcomes that match the level of difficulty of the material taught by the teacher, because the learning process is adjusted to each student's ability. When teachers implement differentiation effectively, mathematics material that was initially considered difficult becomes easier to understand. This occurs because teachers provide special guidance to students who experience difficulties and adjust teaching methods to suit students' preferred learning styles. As a result, learning becomes more meaningful and encourages students to be more active in the learning process.

Model Project Based Learning (PjBL)

The learning model used in this study was Project-Based Learning (PjBL), which actively involves students in designing and implementing projects to achieve learning objectives. Through these projects, students are trained to think critically, solve problems, collaborate, and develop ideas and creativity (Rahma & Ramli, 2024). This model encourages students to be more motivated, active, and innovative in understanding learning materials, including in subjects such as Electronic Control System Operations. The implementation of PjBL has been proven effective in increasing students' learning activities and engagement because it provides opportunities for students to learn independently and collaboratively through design, investigation, and decision-making activities (Merla Madjid et al., 2025). In addition, project-based learning allows students to learn from real-life situations, making the knowledge gained deeper and more meaningful. This study shows that the combination of a differentiated learning approach and the Project-Based Learning model has a significant impact on improving students' activeness and learning outcomes at the elementary school level, while also serving as a reference for future research on the application of innovative learning models and approaches.

The increase in average scores cannot be separated from the use of the project-based learning model. Project-based learning enables students to learn in real problem situations, which can lead to long-lasting knowledge and well-organized learning projects, thereby improving student learning outcomes. The novelty of this study lies in the combination of a differentiated approach with a project-based learning model, which has a significant impact on enhancing active learning among elementary school students. The results of this study can improve students' learning activities and serve as a reference for researchers conducting further studies on the application of learning approaches and models.

Conclusion

Based on the research findings and discussion, it can be concluded that the implementation of a differentiated learning approach using the Project-Based Learning model was carried out in two cycles consisting of four stages. Differentiated learning was implemented through the identification of students' learning needs, lesson planning, the application of differentiated processes, content, and products, followed by evaluation and reflection. The implementation of the Project-Based Learning model included determining essential questions, designing projects, scheduling activities, monitoring progress, assessing outcomes, and evaluating learning experiences. The results of the actions in Cycle I indicated the need for improvement, particularly in classroom management, providing motivation to encourage students to participate more actively in discussions, and delivering clearer instructions. After improvements were made in Cycle II, a percentage result of 81.28% was

achieved, indicating that students' learning activities had increased optimally and that the learning process could be considered successful.

References

- Amalia, R. (2024). Memahami Keragaman Siswa Danpemuenuhan Kurikulum: Refleksi Konteks Pembelajaran Berdifferensiasi Di Sekolah Ppl. *Primary*, 2(5), 267-273.
- Deni, A. (2025). Makna Literasi dan Kecakapan Hidup Abad Ke-21. *Promosi Literasi di Era Digital*, 86.
- Fadhilah, R. Z., & Nuroso, H. (2024). EFEKTIVITAS MODEL PROJECT BASED LEARNING (PJBL) TERHADAP HASIL BELAJAR MATEMATIKA KELAS II SD ISLAM AL MADINA SEMARANG. *Jurnal Bionatural*, 11(1), 103-110.
- Husnullail, M., & Jailani, M. S. (2024). Teknik pemeriksaan keabsahan data dalam riset ilmiah. *Jurnal Genta Mulia*, 15(2), 70-78.
- Irayana, I., & Assyauqi, I. (2024). Eksperimen penerapan pembelajaran berbasis proyek (pjbl) pada peningkatan kreativitas anak usia dini. *JEA (Jurnal Edukasi AUD)*, 10(1), 47-56.
- Kiska, N. D., Haryanto, E., & Indryani, I. (2024). Improving Students' Collaboration Skills Using the RADEC Learning Model in Elementary School Science Learning. *Jurnal Pijar Mipa*, 19(2), 240-247.
- Maulidina, D. M., Pratiwi, D. A., Aslamiah, A., Salma, S., Latifatunnisa, L., Nugroho, I. E. P., ... & Syarifudin, A. (2024). Peran Sekolah dan Guru Penggerak dalam Implementasi Kurikulum Merdeka di SDN Sungai Andai 3. *MARAS: Jurnal Penelitian Multidisiplin*, 2(2), 1118-1130.
- Merla Madjid, S. S., Utami, A., Dewanto, M. P., Mardiaty, S. S., Sumitro, N. K., Wahyuniar, S. P., ... & Md, A. (2025). *Pembelajaran Aktif: Teknik Dan Strategi Untuk Meningkatkan Keterlibatan Siswa*. PT. Nawala Gama Education.
- Nasrodin, N., Faishol, R., & Fauzi, A. (2025). Optimalisasi Kreativitas Peserta Didik Melalui Penerapan Pembelajaran Diferensiasi Produk. *Ar-Risalah Media Keislaman Pendidikan dan Hukum Islam*, 23(1), 168-181.
- Novianti, W. (2025). Pengaruh Strategi Pembelajaran Berdiferensiasi terhadap Minat Belajar Siswa pada Kurikulum Merdeka. *At-Tarbiyah: Jurnal Penelitian dan Pendidikan Agama Islam*, 2(2), 589-595.
- Puspitasari, I. B., Reffiane, F., & Azizah, M. (2025). Efektivitas Model Project Based Learning terhadap Hasil Belajar IPAS Materi Tumbuhan pada Siswa Kelas IV SDN Gayamsari 01. *JURNAL PENDIDIKAN MIPA*, 15(2), 635-642.
- Rahman, S. A., & Ramli, M. (2024). Model Pembelajaran: Problem Based Learning & Project Based Learning. *INFINITUM: Journal of Education and Social Humaniora*, 1(1), 62-81.
- Sulifah, A. S., Nuryatin, T., & Mursidik, E. S. M. (2025). Upaya Penerapan Project Based Learning untuk Meningkatkan Keaktifan Siswa SD Kelas IV. *Journal of Science and Education Research*, 4(1), 35-39.
- Susanto, D. A., Lestari, A., Husnita, L., Nursifa, N., Huan, E., Amay, S., ... & Akbar, W. K. (2025). *Metode penelitian pendidikan*. CV. Gita Lentera.
- Tanjung, D. S., Pinem, I., Mailani, E., & Ambarwati, N. F. (2024). *Penelitian tindakan kelas*. PT. Sonpedia Publishing Indonesia.
- Trisnani, N., Zuriah, N., Kobi, W., Kaharuddin, A., Subakti, H., Utami, A., ... & Yunefri, Y. (2024). *Pembelajaran berdiferensiasi dalam kurikulum merdeka*. PT. Mifandi Mandiri Digital.
- Uno, H. B., & Mohamad, N. (2022). *Belajar dengan pendekatan PAILKEM: pembelajaran aktif, inovatif, lingkungan, kreatif, efektif, menarik*. Bumi Aksara.

Utomo, P., Asvio, N., & Prayogi, F. (2024). Metode penelitian tindakan kelas (PTK): Panduan praktis untuk guru dan mahasiswa di institusi pendidikan. *Pubmedia Jurnal Penelitian Tindakan Kelas Indonesia*, 1(4), 19-19.