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Increasing Students' Learning Activity Through a Differentized Learning Approach Using the Project Based Learnig Model in Primary Schools

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ABSTRACT

Purpose of the Study: This research aims to explore the application of a differentiated learning approach using the Project-Based Learning (PjBL) model in IPAS (Integrated Science) lessons to enhance student engagement and activity in Class IV at elementary school 31/IV. The study addresses the issue of low student engagement in learning activities, acknowledging the diverse learning needs of students.

Methodology: The study employs Classroom Action Research (CAR) with data collection techniques including observations, interviews, and documentation. The research subjects consist of 16 male and 7 female students, totaling 23 participants. Data were gathered through direct classroom observations and documented records during the learning sessions.

Main Findings: The findings reveal a significant improvement in student engagement. In the first cycle, the average percentage score for student activity was 62.34%, which increased to 81.40% in the second cycle. These results indicate that the differentiated learning approach, coupled with the PjBL model, effectively enhances student participation and activity in learning.

Novelty/Originality of this Study: This research introduces a novel integration of differentiated learning with the PjBL model, offering a tailored educational experience that caters to diverse learning styles and needs. By allowing students to engage creatively and produce tangible projects, the approach fosters increased motivation and active participation. The study not only demonstrates the efficacy of this combined method in improving student engagement but also provides a framework for applying differentiated and project-based learning in various educational contexts. This innovative approach holds promise for transforming traditional teaching methods and enhancing student learning experiences.

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1. INTRODUCTION

Education is an important part of human life. Education gives a person the ability to develop qualities and characteristics. According to Zulkhi, [1], the importance of education is because it provides learning and self-development for students. Therefore, appropriate education and adequate educational resources need to be included in the process of creating good education. Education has the term Teaching and Learning activities or Teaching and Learning Process (Learning Process). The two cannot be separated in this process, which involves both activities. The learning process can occur even when no one is teaching. This is because the learning process occurs due to the interaction of the individual with his environment. Schools are facilities provided by the government to carry out the learning process for students.

Learning is an effort to make students learn or activities carried out to teach students. Learning is expected to be able to go in this direction, namely full of dynamics that can activate students. This can be done by using learning media that are more interesting and innovative and easily available in the environment. Media is needed so that learning can involve more senses so that students will understand and master their learning outcomes more optimally. This will be possible if students are able to use as many of their senses as possible in the learning process in class, namely in interacting with learning material [2]-[4].

In fact, every individual is different from one another. Likewise, each student in the class is definitely different from one another. There are so many student needs that must be met. Without realizing it, teachers face a wide variety of students every day. Teachers are always faced with various challenges in teaching and often have to do and decide one thing at a time. Many teachers are not aware of this extraordinary skill, because it happens so naturally in the classroom and the teacher facing these challenges becomes normal for him. Various efforts are made by teachers, of course the aim is to ensure that each student is successful in the learning process by seeing the many differences between one student and another, of course there is a need for differentiated learning.

The theory behind the need for differentiated learning is the difference from the ecological system of each individual (family background, culture, politics, economy, environment, etc.), multiple intelligences, zone of proximal development (ZPD), learning modalities or what we know as with learning styles, as well as many other differences that may be found in each individual. Below are several theories that actually individuals are different. There are 4 theories behind the need for differentiated learning, namely Ecological Systems Theory, Multiple Intelligences Theory, Zone of Proximal Development (ZPD) Theory, Learning Modalities. From this theory, each student also has their own specialties [5], [6]that every student is different. All of them are different from each other. They have different needs and cannot be equalized between one student and another, so differentiated learning is required.

According to Deunk, [7], ideal learning is learning that is able to fully stimulate student creativity, make students active, achieve effective learning goals, and takes place in comfortable conditions. Ideal learning does not only focus on the results achieved by students but places more emphasis on the learning process. How the learning process can provide understanding, intelligence, perseverance, quality, and shape students' character, morals, or behavior that can be applied in everyday life. One of the lessons in the independent curriculum is IPAS, which is one of the curriculum developments, which combines science and social studies material into one learning theme. Science studies nature, of course also with the conditions of society or the environment, making it possible to teach it in an integrative way [8]. With IPAS, it is hoped that the literacy and numeracy context required in the Minimum Competency Assessment can be understood by students easily. Context can be used as a stimulant in creating literacy and numeracy questions, in the form of text, whether fiction, non-fiction or a combination of fiction and non-fiction. It is hoped that students' literacy and numeracy will increase

Science that studies living things and inanimate objects in the universe and their interactions, and examines human life as individuals as well as social creatures who interact with their environment. In general, science is defined as a combination of various knowledge that is arranged logically and systematically by taking into account cause and effect. This knowledge includes natural knowledge and social knowledge. IPAS education has a role in realizing the Pancasila Student Profile as an ideal depiction of the profile of Indonesian students. IPAS helps students grow their curiosity about phenomena that occur around them. This curiosity can trigger students to understand how the universe works and interacts with human life on earth. This understanding can be used to identify various problems faced and find solutions to achieve sustainable development goals. The basic principles of scientific methodology in science and science learning will train scientific attitudes (high curiosity, critical, analytical thinking skills and the ability to draw appropriate conclusions) which will give birth to wisdom in students.

Based on preliminary study observations by researchers at elementary school 31/IV , it was found that during the initial diagnostics, the majority of students in science and science learning wanted a variety of learning methods. Supported by interviews conducted with the fourth grade teacher at elementary school 31/IV, namely Mr. AR. as a class IV teacher. The results obtained show that there is a diversity of students in class IV where each student has different talents, interests and abilities so that teachers must facilitate students according to what is needed. There are active students, there are students who like reading, and there are also students who like watching videos, there are various kinds of preferences, but with the various methods and methods that the teacher has used, there are still some students who are not interested, don't like it. or ineffective due to differences in the interests of various students. So the researcher provides a solution, namely a differentiated process approach.

Differentiated learning is a frame in the learning process in the classroom, based on the problems above, the researcher added a learning model, namely Project Based Learning, so that it becomes a solution to overcome these problems. Using a differentiated approach and paired with the project based learning model will make the active learning process of students increase. . Project based learning learning model is a learning model that focuses on the student's learning process and has results in the form of products, meaning that students are free to

determine their own learning activities and the projects they create. This research is designed to provide an active learning process using a differentiated approach using the project based learning (PjBL) model, which is learning that makes students active in building and linking material concepts and the process of creating a product [9], [10]. The use of the PjBL learning model really allows students to be active in the science and science learning process through projects that suit the students' needs and interests.

Previous research was conducted by Nawati [11],The effect of differentiated problem based learning model on science learning outcomes in elementary school students. This research aims to determine the effect of the problem based differentiated learning model on science learning outcomes. Data was obtained by providing dozens of instruments, then the results were analyzed using the normality test, homogeneity test and paired sample T test. The results of the data analysis test show that the data obtained is regular and homogeneous. Hypothesis testing shows a significance value of 0.002 so that there is a significant difference between students' science learning outcomes before and after using the problem based learning model with differentiated learning strategies. What makes this research different is that it uses CAR on science material using the Project Based Learning Model.

2. RESEARCH METHOD

The research method used in this research is classroom action research. Classroom action research is an action carried out by the teacher/performer, starting from planning to assessing real actions in the classroom in the form of teaching and learning activities to improve the learning conditions carried out [24]. This classroom action research was carried out at Elementary School 25 Palembang which was carried out in class VI.B in thematic subject Theme 1 “Save Living Creatures” Subtheme 2 “My Friend Animals”. The subjects in this classroom action research were students in class VI.B of Elementary School 25 Palembang, totaling 34 students, consisting of 19 male students and 15 female students. Learning in class is still stated to be less than optimal, where the learning outcomes obtained from the pre-cycle have not yet fully reached the specified minimum completeness criteria (KKM). This research method uses classroom action research which is carried out in three cycles with 1 meeting in each cycle and collaborating with tutor teachers. This classroom action research was carried out in a cyclical process consisting of four stages, planning, action, observation/evaluation, and reflection [25].

This research aims to improve students' active learning process by using a differentiated approach and a project based learning model. In accordance with these objectives, the type of research used by researchers is classroom action research (PTK). Classroom action research is an action to improve learning in the classroom [12] From this explanation, classroom action research, which is often abbreviated as PTK, is research that raises actual problems carried out by teachers which is an examination of learning activities in the form of actions to improve and increase learning practices in the classroom in a professional manner.

This research was carried out at SD N 31/IV JAMBI CITY, Jambi City. The subjects in this research were 23 class IV students, consisting of 7 female students and 16 female students. The research design that will be developed in this classroom action research is the Kemmis and Mc Taggart model research design quoted by [13], [14]. In Kemmis and Mc Taggart's PTK model, it is described that action research is carried out through several cycles, and each cycle consists of four stages, namely: planning (plaining), carrying out action (action), carrying out observation (observation), and carrying out reflection or analysis (reifleiction). Data collection techniques in this research used observation, interviews and documentation. The following is an instrument for observing student activity from 9 active indicators.

3. RESULTS AND DISCUSSION

The presentation of research results is based on notes or reflections, observations made at the end of the meeting. Each cycle consisting of 2 meetings each will serve to answer research questions which are the focus of this classroom action research. Data from teacher reflections and observations were collected from each meeting in each cycle in this research to determine the extent to which the differentiated approach with the project based learning model was implemented to increase student learning activity in science and technology content in class IV elementary school 31/IV in Jambi City.

In cycle 1 of meeting 1, the researcher started a class action research (PTK) to see how the differentiated approach and project based learning model were implemented in increasing students' activeness in science and technology content on the richness of Indonesian culture..

1. Planing

Research is conducting a survey of schools that will be used as research objects. To identify problems regarding students' conceptions and the learning process in the classroom. The things that need to be done at this stage are:

a. Prepare the learning tools that will be used

b. Prepare the necessary sources, materials and learning media.
c. Prepare an observation sheet for learning activities.

2. Implementation of the First Meeting

Held on Monday, March 18 2024. Teaching is carried out for two hours (2 x 35 minutes) at 10.00-11.10 at elementary school 31/IV Jambi City. Before starting teaching and learning activities, teachers should know students' learning interests because in implementing a differentiated approach it is more about students' learning needs. The observation method is carried out through direct observation in students' daily learning processes when they complete their learning tasks.

a. Initial Activities (Preliminary)

The initial activity consists of starting the lesson by saying hello and inviting the students to pray together before starting the learning process, asking about the condition of the students, taking attendance of the students, then the teacher conditions the students to start the lesson by taking out tools related to the learning process learn among them Printed books, notebooks, books and so on, carry out viewings by showing pictures or things related to diversity in the surrounding environment. Then the teacher explains the learning objectives that will be studied in the science and science lesson content material "Indonesian cultural riches".

b. Core Activities

In the core activity of the first stage, the teacher and the students determine the basic questions, where in determining the basic questions the teacher provides stimulus to the students by showing a learning video. Students listen and observe what is broadcast, then students and teachers do questions and answers. Students are also given examples from the surrounding environment regarding diversity material (differentiated content). The teacher explains and students are directed to express opinions or related questions, then the teacher provides answers and reinforcement.

In the second stage, namely designing product planning, the teacher and students form groups consisting of 4 groups, group formation is based on needs, not randomly. After that, the teacher gives students worksheets to work on together. Each group discusses creating a product related to diversity material, the teacher helps and directs the students. After that, each group of students will explain what product they will make in front of their friends. Each product that students will make is free as long as it is related to the subject matter, this is called product differentiation. In the third stage of preparing a schedule, in this activity students and their groups prepare a schedule for making products, namely on Wednesday or 2 days after determining the schedule. Students prepare materials and divide their respective tasks. After everything has been agreed upon, students work on the LKPD that has been given together.Peinutup

The teacher asks students to work together to conclude the learning materials and products to be worked on, then the teacher asks students to close the lesson by reading a prayer and saying hello.

Meeting 2

Cycle 1 meeting 2 was held on Wednesday, with a time allocation of 2 x 35 minutes. At the second meeting, make the product that has been planned.

1. Planning

Peineiliti Continue to the schools that will be used as research objects and continue the cycle that was carried out yesterday. To identify problems regarding students' conceptions and the learning process in the classroom. The things that need to be done at this stage are:

a. a. Prepare the learning tools that will be used.
b. b. Prepare the necessary sources, materials and learning media.
c. c. Prepare an observation sheet for learning activities.

2. Implementation of the second meeting

The meeting will be held on Wednesday. The learning will be held for two hours (2 x 35 minutes) at 10.15 – 11.25 at SD Negeri 31/IV Jambi City

a. Initial Activities (Preliminary)

Initial activities consist of opening the lesson by saying hello and inviting the students to pray together before starting the learning process, asking about the condition of the students, taking attendance of the students, then the teacher conditions the students to start the lesson, carrying out apperception and adapting to the students' needs through differentiation.

b. Core Activities

This core activity continues from the previous meeting, which included the stages of making products using the materials and tools that have been prepared. The teacher gives instructions to the students to prepare everything starting from group positions, materials and tools. Once everything is ready the teacher invites the students to start making the product. In the process of making this product, the teacher monitors each group and helps if there is a problem encountered. In the process of making this product, the teacher observes each student

involved and the tasks they carry out. The teacher sees the active learning process of each student, then becomes a reference for assessing activeness.

Next, after the students are ready to make their products, the teacher and students both listen to the results of the presentation of each product from another group, and other groups are given the opportunity to ask questions and comment on each product that has been presented.

c. Closed

The teacher asks students to work together to conclude the learning materials and products to be made, then the teacher asks students to close the lesson by reading a prayer and saying salam.

Tabel 1. Results of Cycle I Student Learning Activity Percentage

No	Observed Learning Activeness Indicators	Achievements		Average
		Meeting I Achievements	Meeting II Achievements	
1	Students' attention is directed towards the teacher's explanation	62.11	74.74	68.42
2	Collaboration in groups	60.00	64.21	62.11
3	Students' ability to express opinions in groups	57.89	63.16	60.53
4	Create a balance of opinion among friends in a group	63.16	66.32	64.74
5	Remember good thoughts when friends share opinions	58.95	63.16	61.05
6	Come up with a brilliant idea	58.95	61.05	60.00
7	Create thorough planning and division of work	58.95	60.00	59.47
8	Decisions are based on considerations of other members	60.00	62.11	61.05
9	Help each other and solve problems	62.11	65.26	63.68
Average		60.23	64.44	62.34

In the table above, you can see the learning activity of cycle I students by using a differentiated approach and project based learning model in science and science learning.

The first indicator of students' attention to the teacher's assessment was 62.11% and in the second meeting it was 74.74%. The average percentage rate is 68.42. The second activity indicator was the same in the group, namely 60.00% and at the second meeting it was 64.21%. The average percentage rate is 62.11. The third indicator of activity, student ability, showed opinion in the group, namely at the first meeting it was 57.89% and at the second meeting it was 63.16%. The average peirseintasei is 60.53% The indicator of activeness of the four shows the balance of opinion towards the team, namely at the first meeting it was 63.16% and at the second meeting it was 66.32%. The average peirseintasei rate is 64.74%. The fifth indicator of activity showed good results when the participants held their opinions, namely at the first meeting it was 58.95% and at the second meeting it was 63.16%. The average peirseintasei rate is 61.05%. The general activity indicator shows a very good idea, namely at the first meeting it was 58.95% and at the second meeting it was 61.05%. With peirseintasei 60.00%. The seventh indicator of activity leads to mature planning and distribution of work, namely at the first meeting it was 58.95% and at the second meeting it was 60.00%. Average peirseintasei rate 59.47%

Indicators of activity, ideals and decision-making are based on the considerations of other members, namely at the first meeting it was 60.00% and at the second meeting it was 62.11%. The average peirseintasei rate is 61.05%. The indicator of activity in balance in helping each other and solving problems was at the first meeting 62.11% and at the second meeting it was 65.26%. The average peirseintasei rate is 63.68%.

Cycle 2

Meeting 1

Based on the reflections from cycle 1, it was found that students' learning activity was beginning to increase in science learning with the implementation of a differentiated approach and the project based learning model, however, to further increase students' learning activity, the research continued with research in cycle 2, meeting 1, which was held on Wednesday, April 24 2024 at 12.30-13.40 WIB with a time allocation of 2 x 35 minutes for each meeting. In cycle 2 of meeting 1, the research still explains the material wealth of Indonesia.

a. Initial Activities (Introduction)

The initial activity consists of starting the lesson by saying hello and inviting the students to pray together before starting the learning process, asking about the condition of the students, taking attendance of the

students, then the teacher conditions the students to start the lesson by taking out tools related to the learning process learn among them printed books, notebooks, peina and others, carry out apeirseipsi. Then the teacher explains the learning objectives that will be studied in the IPAS subject content "Indonesian cultural riches".

b. Core Activities

In the core activity of the first stage, the teacher and the students determine the basic questions, where in determining the basic questions the teacher provides a stimulus to the students by showing a learning video. Students listen and observe what is broadcast, then students and teachers do questions and answers. Students are also given examples from the surrounding environment regarding diversity material (differentiated content). The teacher explains and students are directed to express opinions or related questions, then the teacher provides answers and reinforcement. In delivering the material, the teacher and students create a game of which there are 3 types, the first is a guessing game, the second is a whispering game, and the third is guessing the environment. This game was created in such a way because of the learning needs of students (differentiated process) who want to learn while playing so that in the process students can easily grasp the material presented.

In the second stage, namely designing product planning, the teacher and students form groups consisting of 3 groups according to the students' needs. After that, the teacher gives students worksheets to work on together. Each group discusses creating a product related to diversity material, the teacher helps and directs the students. After that, each group of students will explain what product they will make in front of their friends. Each product that students will make is free as long as it is related to the subject matter, this is called product differentiation.

In the third stage of preparing a schedule, in this activity students and their groups prepare a schedule for making products, namely on Wednesday. Students prepare materials and divide their respective tasks. After everything has been agreed upon, students work on the LKPD that has been given together.

c. Closed

The teacher asks students to work together to conclude the learning materials and products to be made, then the teacher asks students to close the lesson by reading a prayer and saying salaam.

Meeting 2

Cycle 1 meeting 2 was held on Wednesday, with a time allocation of 2 x 35 minutes. At the second meeting, make the product that has been planned.

1. Planning

Research Continues Research into schools that will become research objects. To identify problems regarding students' conceptions and the learning process in the classroom. The things that need to be done at this stage are:

a. Prepare the learning tools that will be used.
b. Prepare the necessary sources, materials and learning media.
c. Prepare an observation sheet for learning activities.

2. Implementation of the second meeting

The meeting will be held on Wednesday. The lesson will be held for two hours (2 x 35 minutes) at 12.30 – 14.10 at SD Negeri 31/IV Jambi City

a. Initial Activities (Preliminary)

Initial activities consist of opening the lesson by saying hello and inviting the students to pray together before starting the learning process, asking about the condition of the students, taking attendance of students, then the teacher conditions the students to start learning and adapting to the students' needs through differentiation.

b. Core Activities

This core activity continues from the previous meeting, which included the stages of making products using the materials and tools that have been prepared. The teacher gives instructions to the students to prepare everything starting from group positions, materials and tools. Once everything is ready the teacher invites the students to start making the product. In the process of making this product, the teacher monitors each group and helps if there is a problem encountered. In the process of making this product, the teacher observes each student involved and the tasks they carry out. The teacher sees the active learning process of each student, then becomes a reference for assessing activeness.

Next, after the students are ready to make their products, the teacher and students both listen to the results of the presentation of each product from another group, and other groups are given the opportunity to ask questions and comment on each product that has been presented.

c. Conclusion

The teacher asks students to work together to conclude the learning materials and products to be made, then the teacher asks students to close the lesson by reading a prayer and saying Salam.

Table 2. Results of Cycle II Student Learning Activeness Percentage

No	Observed Learning Activeness Indicators	Achievements		Average
		Meeting I Achievements	Meeting II Achievements	
1	Students' attention is directed towards the teacher's explanation	89.47	90.53	90.00
2	Collaboration in groups	80.00	81.05	80.53
3	Students' ability to express opinions in groups	76.84	80.00	78.42
4	Create a balance of opinion among friends in a group	76.84	83.16	80.00
5	Remember good thoughts when friends share opinions	78.95	83.16	81.05
6	Come up with a brilliant idea	76.84	81.05	78.95
7	Create thorough planning and division of work	81.05	82.11	81.58
8	Decisions are based on considerations of other members	80.00	81.05	80.53
9	Help each other and solve problems	81.05	82.11	81.58
	Average	80.12	82.69	81.40

In the table above, you can see the learning activity of students in cycle I by using a differentiated approach with a project based learning model in science and science learning. The first indicator is that students' attention to the teacher's explanation is 89.47% and in the second meeting it is 90.53%. The average percentage level is 90.00%. The second activity indicator was the same in the group, namely 80.00% and at the second meeting it was 81.05%. The average peirseintasei rate is 80.53%. The third indicator of activity, student ability, showed opinion in the group, namely at the first meeting it was 76.84% and at the second meeting it was 80.00%. The average peirseintasei is 78.42%. The fourth activity indicator shows the balance of opinion towards the team, namely at the first meeting it was 76.84% and at the second meeting it was 83.16%. The average peirseintasei rate is 80.00%. The fifth indicator of activity showed good results when the participants held their opinions, namely at the first meeting it was 78.95% and at the second meeting it was 83.16%. The average peirseintasei rate is 81.05%. Indicators of internal activity show a very good idea, namely at the first meeting it was 76.84% and at the second meeting it was 81.05%. With peirseintasei 78.95%. The seventh indicator of activity leads to mature planning and distribution of work, namely at the first meeting it was 81.05% and at the second meeting it was 82.11%. Average peirseintasei rate 81.58%. Indicators of activity, ideals and decision-making are based on the considerations of other members, namely the first meeting was 80.00% and the second meeting was 81.05%. The average peirseintasei rate is 80.53%. The indicator of activity in balance in helping each other and solving problems was at the first meeting 81.05% and at the second meeting it was 82.11%. The average peirseintasei rate is 81.58%.

Table 3. Learning Activeness of Class IV Students at SDN 31/IV Jambi City

No	Observed indicators	Cycle I	Cycle II	Improvement
1	Students' attention is directed towards the teacher's explanation	68.42%	90.00%	21.58%
2	Collaboration in groups	62.11%	80.53%	18.42%
3	Students' ability to express opinions in groups	60.53%	78.42%	17.89%
4	Create a balance of opinion among friends in a group	64.74%	80.00%	15.26%
5	Remember good thoughts when friends share opinions	61.05%	81.05%	20.00%
6	Come up with a brilliant idea	60.00%	78.95%	18.95%
7	Create thorough planning and division of work	59.47%	81.58%	22.11%
8	Decisions are based on considerations of other members	61.05%	80.53%	19.48%
9	Help each other and solve problems	63.68%	81.58%	17.90%
	Average Learning Activity	62.34%	81.40%	19.07%

From the table above, Student Learning Activeness through the implementation of the differentiated approach and the Project based learning model has experienced an increase, the increase data can be seen through the graph as follows.

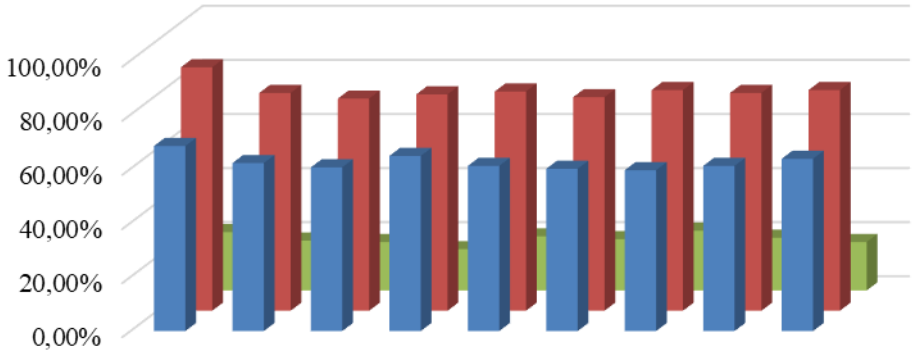

Figure 1 Diagram of Increasing Student Learning Activeness in Cycle I and Cycle II

Based on the data above, students' learning activity increased in cycle II. Students pay attention to the teacher's opinion ranging from 68.42% in cycle I to 90.00% in cycle II, Students' cooperation in groups is around 62.11% in cycle I to 80.53%, Students express their opinion in groups is around 60.53% in cycle I, it was 78.42% in cycle II, Students showed a good balance of opinion between friends in the group, it was 64.74% in cycle I, it was 80.00% in cycle II, Students expressed good feelings when their friends had an opinion of 61.05% in cycle I was 81.05% in cycle II, Students presented outstanding ideas ranging from 60.00% in cycle I to 78.95% in cycle II, Students made mature plans and division of work amounting to 59.47% in cycle I became 81.58%, Students make decisions based on consideration of other members, ranging from 61.05% in cycle I to 80.53% in cycle II. Students help each other and solve problems, ranging from 63.68% in cycle I to 81.58% in cycle II.

Based on the results of research carried out in cycles I and II in an effort to increase the learning activity of students at elementary school 31/IV Lebak Bandung, Jambi City, the results of the analysis of the data obtained resulted in an increase in student learning activity between cycles I and II as a result of the application of differentiated approaches and models. Project based learning during the learning process. In each cycle, there was an increase, based on the results obtained, the average score of the observation sheet for student learning activities in cycle I was 62.34%, in cycle II it increased to 81.40%.

Increasing student learning activity is caused by teachers having improved the learning and teaching process for students, both from the introductory stage to the closing stage. Student learning activity increases because the teacher improves the learning and teaching process for students, starting from the introductory stage to the closing stage. In this way, when the discussion took place, the students seemed enthusiastic about

participating in the lesson. Apart from that, it can be seen that students discuss more and students focus more on the material being studied. At the final stage of learning activities, students are able to work independently, so that students understand the material being studied better.

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Differentiate

1) Differentiate in content (Content)

Teachers differentiate the science/science learning content by varying what students learn. The content in this case is closely related to the learning material and curriculum. Teachers adapt curriculum content and learning materials to students' conditions and abilities [17]. This content differentiation is related to what students learn by considering the results of mapping student learning needs. However, differentiating learning content does not necessarily mean that the teacher makes each student experience different learning material. This content differentiation is carried out by teachers analyzing students' readiness to learn referring to the material to be taught. Teachers can link the learning to be taught with material that has been taught and mastered previously. The reading material in learning can be varied by the teacher according to the student's level of understanding. When a reading source in learning cannot make students understand the lesson material, the teacher can use other reading materials to adjust the students' readability level [18]. Teachers can provide additional resources appropriate to students' level of understanding.

2) Differentiate Process

This process differentiation is how students interact with the material which will later determine students' learning choices [20]. Classroom learning needs to be modified by adapting students' learning styles and choices so that students' learning needs can be accommodated well. Accommodating one's own learning as stated by Gregory and Chapman means that learning is made so that students can be active; learning activities involve actual learning, such as exercises, games, demonstrations, modeling; and learning does not only occur individually but is also planned to take place in groups.

3). Product Differentiation

Products include things that reflect students' level of mastery of the mathematics subject matter they have studied. Differentiating in products means that teachers give students various choices in how they demonstrate their learning outcomes [21]. The product in mathematics learning is a form of student interpretation in understanding the subject matter taught by the teacher in the field of mathematics [22], [23]. states that differentiation in this product can be in the form of reports, brochures, plays, etc.; the resulting product is a reflection of student understanding; and teachers can provide various variations and challenges. This product differentiation can be organized by teachers in the form of learning projects. So, students are instructed to present their mathematical understanding by carrying out a project for making mathematical products determined by the teacher by providing variations. .

Differentiated learning works well when students in the class can experience the following things: 1) Students are able to achieve all learning objectives, The application of differentiated learning in mathematics subjects can make it easier for students to understand Mathematics subject matter than before and students achieve improved grades.; 2) Students obtain learning outcomes that are in accordance with the level of difficulty of the material provided by the teacher.

This happens because students are taught according to their abilities. When teachers implement differentiated learning well, learning mathematics which was previously difficult becomes easier. This is because in implementing differentiated learning, when students experience learning difficulties, the teacher provides special guidance to the student. Apart from that, teachers also teach by paying attention to students' learning styles. Then, the teacher will adapt the mathematics learning method to the student's learning style. Then, the teacher will adapt the mathematics learning method to the student's preferred learning style so that the student's

learning difficulties can be resolved because their learning needs are met.; 3) A strong relationship is established between teachers and students so that students are enthusiastic about learning.

A differentiated learning environment requires teachers to better understand and pay more attention to the psychological well-being of their students. Teachers also accompany students to be able to achieve improved learning outcomes by creating a comfortable atmosphere when they are with students. This makes students have a closer relationship with the teacher and they become more enthusiastic about carrying out learning.Siswa menjadi terbiasa dan menghargai keberagaman

The diversity referred to here is the diversity of levels of ability and learning needs of each student. Students will become accustomed to the teacher's way of handling students whose needs are different. Even though differentiated learning is something that has been around for a long time in the world of education, the introduction of the concept of its application is something new for teachers in Indonesia. This means that teachers still do not fully understand how to implement differentiated learning in all subjects, especially in mathematics learning [24]. Differentiated learning has become known in Indonesia since the introduction of the driving teacher education program which was first held in 2020 [25].

Differentiated learning in its implementation will certainly experience obstacles. Schools that implement the Independent Curriculum also adjust learning in each class to run in a differentiated manner. Implementing differentiated learning will take up more time than implementing undifferentiated learning. This is because teachers must apply variations in learning. Teachers must be able to meet all the different needs of students. This requires more time, while the time available is limited. Often before all students' needs are met, the teacher's time is no longer enough to complete the lesson. Teachers often have difficulty dividing their time and feel they lack time to differentiate learning. That is something that often becomes an obstacle in implementing differentiated learning in IPAS subjects.

Model Project Based Learning (PJBL)

The learning model uses Project Based Learning, namely a learning model that involves students taking an active role in designing learning objectives to produce a product or project. The projects that have been created by students encourage students to hone their skills in how to deal with incomplete or inaccurate information and determine their own goals or group collaboration, so that each student is directed to be able to express positive ideas, learn motivation, take an active role and innovate. in understanding learning material, especially the subject of Operating Electronic Control Systems. Therefore, the use of the project based learning model is very appropriate to increase student activity. The project based learning model can increase student activity [26], [27]. The results of this research are also in accordance with the opinion of Theresia [28] that the Project Based Learning model is a learning model that provides teachers with the opportunity to manage learning in the classroom by involving project work and requiring students to carry out design activities, carry out investigative activities, solve problems, make decisions, provide opportunities for students to work independently or in groups, so as to activate students in the learning process. The results of this research are also in accordance with the opinion of [29], [30] who stated that one way to improve student engagement is by providing clear and precise teaching in accordance with the teaching objectives to be achieved. Apart from improving student involvement, it also explains how to increase student involvement or student activity in learning. This can be done by using the right learning model.

The increase in average value cannot be separated from the use of the project based learning model. The project based learning method allows students to learn in real problem situations, which can give birth to permanent knowledge and organize projects in learning, so that it can improve student learning outcomes. The latest from this research is that the use of a differentiated approach combined with the Project based Learning model will have a big impact on students in increasing active learning in elementary schools. The impact carried out on research can increase students' learning activity and become a morning reference for researchers to conduct research on the application of learning approaches and models.

4. CONCLUSION

Based on the results of the research and discussion, it can be concluded that the use of the application of a differentiated approach with the Project Based Learning model is carried out in 2 cycles with 4 stages, as for differentiated learning in its application, namely knowing students' learning needs, planning learning, as for the targets, namely differentiated processes, differentiated content and differentiated products after it carries out Evaluation and reflection. Meanwhile, the application of the project based learning model first determines basic questions, creates project designs, arranges scheduling, monitors project progress, assesses results and evaluates experience.

The application of a differentiated approach with the project based learning model can increase student learning activeness. The results of the percentage of observations of student learning activeness in cycle I were 62.34%, this shows that in cycle I student learning activity was not optimal because there were several indicators

that had not been achieved. Based on the results of the actions in cycle I, several things need to be improved in cycle II, including teachers needing to be smarter in conditioning the class and students, providing motivation to play a more active role in group discussions, providing clear instructions to students regarding learning concepts. Based on the improvement efforts made in cycle II, the percentage results in cycle II were 81.40%, this shows that student learning activity has been running optimally, student learning activity has been achieved and can be declared successful.

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