Application Of The Problem Based Learning (PBL) Model Help With Mind Mapping To Improve Student Activeness And Learning Outcomes

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Abstract

The problem in this research is the low activity and learning outcomes. The purpose of this research is to determine the improvement of activity and learning outcomes of the eleventh-grade students of SMKN 1 Medan through the implementation of Problem-Based Learning model assisted by Mind Mapping. This study was conducted at SMKN 1 Medan. The subject of this research was the students of class XI AKL 3, totaling 32 students. The object of this research is the Problem Based Learning model assisted by Mind Mapping. This research was conducted in two cycles. The data collection techniques in this research are the observation sheets for learning activity and tests of learning outcomes. The data analysis techniques for this research are quantitative data analysis and qualitative data analysis. From the student activity observation sheet in cycle I, there were 15 (46.87%) who fell into the very active and active categories. In cycle II, the number of students categorized as very active and active increased to 31 students (96.87%) and has met the success indicator of ≥75%. From the analysis of the data obtained, the test results showed an average score of the Pre Test as 76.09 with 14 students (43.75%) achieving mastery, and in the Post Test of cycle I, the average score was 81.09 with 28 students (87.5%) achieving mastery. This improved further in the Post Test II with an average score of 90.46, with 32 students (100%) achieving mastery, meeting the success indicator of ≥85%. Based on this analysis, it can be concluded that the implementation of the Problem Based Learning (PBL) model assisted by Mind Mapping can increase student activity and learning outcomes at SMKN 1 Medan.

Keywords : Learning Activity, Learning Outcomes, Problem Based Learning, Mind Mapping

INTRODUCTION

Learning activity is a condition in which students are actively involved in learning interactions and carry out various learning activities to gain new experiences, change behavior, and improve their quality of life. Furthermore, learning outcomes reflect the

measurable skills, abilities, knowledge, or values that students possess after completing a course. Therefore, there is a positive relationship between learning activity and learning outcomes. Through the intensity of activities such as reading, drawing, writing, listening, asking questions, answering, identifying, summarizing, explaining, and applying, students are expected to enrich their thinking with new experiences, which are then reflected in the learning outcomes they achieve (F. A, Asfar, & Asfar, 2020).

Student engagement and learning outcomes are two interrelated and mutually supportive aspects in achieving learning success. According to Kamaruddin (Radina, Hamid, & Yusrizal, 2016) engagement in learning significantly impacts student learning outcomes or achievement. When students are actively involved, such as asking questions, answering teacher questions, writing, listening, and engaging in other activities, this will positively impact their learning outcomes.

According to Motoh (Ayu, Atmadja, & Marhaeni, 2013) learning outcomes are the achievement of educational goals by students who participate in teaching and learning activities. Learning outcomes can also be defined as changes that occur in individuals, reflected in their attitudes and behavior. Learning outcomes provide teachers with an overview of students' cognitive, affective, and psychomotor development in achieving learning objectives. A teacher's success in delivering learning materials is assessed based on the high or low level of student learning outcomes. Therefore, teachers need to innovate and improve learning activities so that students can gain new knowledge, learning experiences, and maximize the learning process, which is reflected in improved learning outcomes (Efstratia, 2014).

Based on the facts described above, low student engagement and learning outcomes are caused by teachers still implementing conventional learning models, namely lectures. The conventional model is a learning model in which learning activities are carried out in a traditional manner, namely teachers still rely on the lecture method in delivering lesson material (Hadihabibi, Abidin, & Husna, 2021). In this model, teachers focus on delivering lesson material through lectures, where students receive information more passively without much interaction or active participation. This shows that the learning model used tends not to involve students directly in the learning process, which can result in a lack of student engagement and interest in the material being taught. Conventional learning models tend to make students feel bored, so the classroom atmosphere becomes less varied (Prameswara & Pius X, 2023). Therefore, innovation in appropriate models and methods is needed to support and assist teachers in improving student engagement and learning outcomes (Mukarima, Wawan, Setiawan, Ningsih, & Choirudin, 2024).

A learning model can be defined as a comprehensive overview of a complex learning process, encompassing learning models, methods, techniques, and procedures (Handayani, Ismaya, & Ermawati, 2023). The choice of learning model is largely determined by the characteristics of the material being studied (exact or non-exact), the depth of the material, the students' learning styles (visual, auditory, or kinesthetic), and their abilities. Teachers are responsible for designing, implementing, and evaluating learning strategies applied in the classroom. Therefore, teachers should develop learning models that can encourage active learning and improve student learning outcomes.

Therefore, it is necessary to be open to innovative and creative learning models such as problem-based learning and discovery learning. One alternative effort that can be done is implementing a problem-based learning model. Problem-based learning (PBL) is one learning model that can be applied to improve learning outcomes (cognitive, affective, and psychomotor) as well as students' higher-order thinking skills (Ayu, Dewa, & Dewi, 2013). In this model, students are not only given direct information, but are more focused on how they identify, analyze, and find solutions to existing problems. This encourages students in groups to be active in the learning process and think critically and creatively. The problem-based learning model is one type of learning model carried out by dividing students into small groups, each consisting of 3-4 students. By dividing the groups, it is expected that student learning outcomes can improve and students become more active in communicating and interacting during the learning process (Saputra, Joyoatmojo, Wardani, & Sangka, 2019).

In line with the description above, previous research conducted by Amalia & Sitompul (Ghofur, 2018)demonstrated that the problem-based learning model had a positive impact on the active learning of basic accounting at SMK Pustek Serpong. This was further supported by research (Fathurrizqy & Ulfatun, 2024) which showed an increase in accounting learning outcomes after implementing the problem-based learning model among class XI AKL 2 students at SMKN 6 Surakarta.

The implementation of the problem-based learning model will be optimal if supported by a learning method. A learning method is a way of delivering subject matter to achieve predetermined objectives. One alternative learning method that can improve student engagement and learning outcomes is mind mapping. Mind mapping, also known as mind mapping or mind maps, is a method of taking notes on subject matter that makes learning easier for students (Tri Pudji Astuti, 2019). This method can make students more active in the learning process because they are guided to summarize the essence, develop ideas, and describe a concept comprehensively into a unified whole, written down in notes. This makes this method more efficient than other methods.

In line with the results of previous research conducted by Hutahuruk (Simanjuntak, 2021)it was revealed that the application of the problem-based learning model combined with the mind mapping method was able to increase student activity and learning outcomes.

Using a problem-based learning model assisted by mind mapping will help students better understand adjusting journal entries because it can help them grasp concepts often considered complex in a simpler and more engaging way. In problem-based learning, students are invited to solve real-life problems related to adjusting journal entries, such as how to adjust accounting records to reflect end-of-period conditions. This process actively engages students in critical thinking and group collaboration. By using mind mapping, students can visualize concepts related to adjusting journal entries more clearly. They can map the relationships between the accounts that need to be adjusted, the types of adjustments made, the causes of the adjustments, and their impact on the financial statements. By mapping this information in diagram form, students not only learn to memorize the adjustment steps but also understand the logic behind each step. Furthermore, mind mapping makes it easier for students to discuss and convey their ideas

to their peers in groups (Gusteti & Neviyarni, 2022). This process increases student participation and encourages them to be more active in asking questions or providing opinions, thus improving learning outcomes (Sekarini, Wiyanto, & Ellianawati, 2020).

Based on the description above, the author is interested in conducting research with the title "Implementation of the Problem Based Learning (PBL) Model Assisted by Mind Mapping to Increase Student Activity and Learning Outcomes at SMKN 1 Medan"

RESEARCH METHODS

This research was conducted in class XI AKL 3 SMK Negeri 1 Medan, with the address at Jalan Sindoro No.1, Pusat Ps., Medan Kota District, Medan City, North Sumatra 20211 and was conducted in the even semester of the 2024/2025 academic year. The subjects in this study were students of class XI AKL 3 SMK Negeri 1 Medan in the 2024/2025 academic year, totaling 32 students (Vera, Yulia, & Rusliah, 2021).

The object of this research is the application of the Problem Based Learning (PBL) learning model assisted by Mind Mapping to improve the activeness and learning outcomes of accounting on the material of adjusting journal entries for trading companies of class XI AKL 3 students of SMK Negeri 1 Medan in the 2024/2025 academic year.

This study used classroom action research. According to Gonzaga & Samuel (2020), classroom action research is a type of research conducted in the classroom to evaluate the impact or consequences of actions implemented on the research subjects within the class.

In this study, the author applied the PTK cycle design using the Kemmis and McTaggart model (Wicaksono, Susilo, & Sueb, 2019), by dividing the implementation procedure into four stages in one cycle, namely: (1) planning, (2) acting, (3) observing, and (4) reflecting.

To address research issues, relevant data is required. To obtain valid and reliable data, data collection methods must be used carefully.

Data analysis is a very important element in every research process. All data obtained will be collected, processed, and analyzed. The results of the data analysis will show the direction, objectives, and explain the purpose of the research. This study uses qualitative and quantitative data analysis (Aslam, Suparji, & Rijanto, 2021). Qualitative data is raw information derived from direct observation in an empirical context. This data is obtained through the observation process, then analyzed descriptively using percentage techniques. The analysis is carried out by comparing the level of student activity in cycle I and cycle II. If the results of the accumulated observations of learning activity in cycle II are higher than in cycle I, it can be concluded that there is an increase in learning activity, so that the first hypothesis is declared accepted (Lestari, Safa'udin, & Indrayany, 2018).

RESULTS AND DISCUSSION

Research result

This research was conducted at SMK Negeri 1 Medan located at Jl. Sindoro No. 1 Medan, Medan Kota District, Medan City, North Sumatra. The purpose of this study was to examine the increase in student activity and learning outcomes in the accounting department through the application of the Problem Based Learning model assisted by Mind Mapping in class XI AKL SMK Negeri 1 Medan in the Even Semester of the 2024/2025

Academic Year (Ismael, Putra, & Siregar, 2022). The subjects in this study were 32 class XI AKL 2 students, consisting of 4 male students and 28 female students. The approach used in this study was Classroom Action Research (CAR), which was carried out in two cycles. Each cycle consisted of two meetings covering four stages, namely planning, implementation, observation, and reflection. This research was carried out through collaboration between researchers and PAPJDM subject teachers. The Problem Based Learning model with the help of Mind Mapping is applied to achieve Learning Objective (TP) point 6, namely understanding the concept of adjustment journals, as described in the Learning Objective Flow (ATP) in point 6.1 regarding the explanation of adjustment journal entries and point 6.2 regarding the analysis of adjustment transactions. To measure student activity, an instrument in the form of an observation sheet is used, while learning outcomes are measured through a test consisting of three stages, namely pre-test, post-test I, and post-test II. Observations of student learning activity were carried out directly during the learning process. Where the observed activity consists of 8 indicators. Each indicator is assessed using a score scale of 1-4. The total score of the eight indicators for each student will be used to determine their level of activity, which is grouped into five categories: inactive, less active, quite active, active, and very active. A student is said to be individually active if they obtain a minimum score of 32. Success in the aspect of learning activity is declared achieved if at least 75% of the total number of students fall into the "Active" category (Novianti, Bentri, & Zikri, 2020).

Meanwhile, learning outcomes are considered complete if the individual student's score in the cognitive test exceeds or is equal to the Minimum Completion Criteria (KKM), which is ≥ 75. Classical learning completion is considered achieved if at least 85% of students from all students obtain a score that is included in the "Complete" category.

The standard of success set for student learning outcomes is 85%. Based on previous data calculations, classical completion rates have increased significantly in each cycle. Before the intervention, the classical completion rate was 43.75%, then increased to 87.5% in cycle I, and reached 100% in cycle II (Masliah, Nirmala, & Sugilar, 2023).
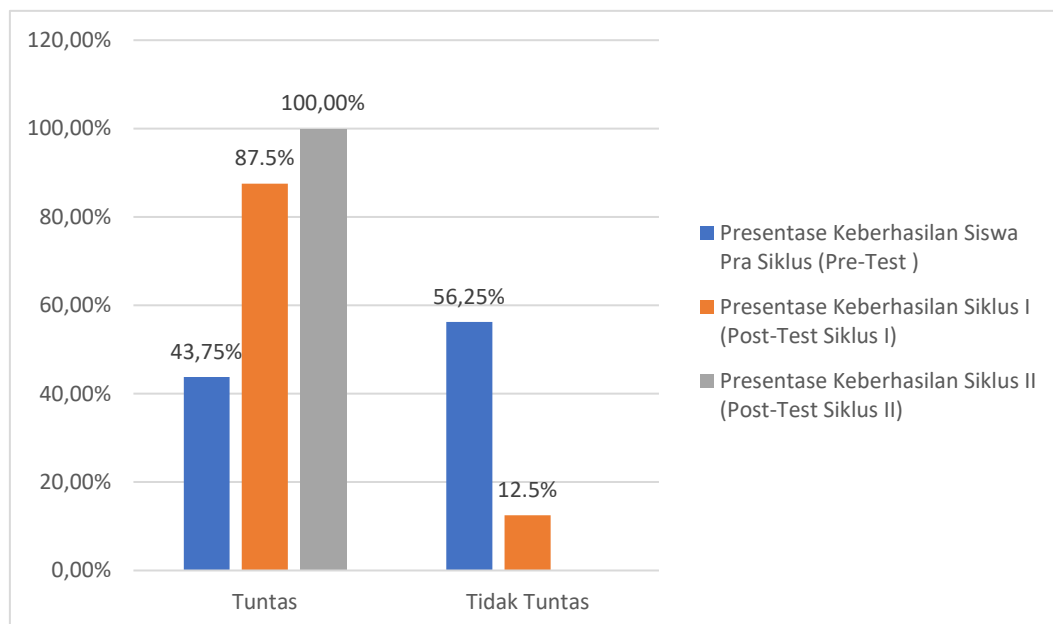
Table 4.4 shows the completeness of student learning outcomes in cycle I and cycle II.

Table 1. Student learning outcomes in Cycles I and II

Test Type	Average value	Completed		Not Completed	
		Number of Students	%	Number of Students	%
Pre-Test	76.09	14	43.75	18	56.25
Post-Test I	81.09	28	87.5	4	12.5
Post-Test II	90.46	32	100	-	-

Based on Table 4.3, the data obtained shows that the pre-test scores of students in cycle I showed that only 14 students (43.75%) reached the Complete category, while 18 students (56.25%) were still in the Incomplete category. This condition indicates that students' initial mastery of the material to be studied is still relatively low. Therefore, research actions are needed to optimize student learning outcomes. Furthermore, the results of post-test I in cycle I showed a significant increase, where 28 students (87.5%) reached the Complete category and 4 students (12.5%) were still in the Incomplete category. The results of post-

test I have shown an improvement in student learning outcomes after the actions were taken, and have reached the specified criteria, but the researcher still took further actions to maximize these learning outcomes . Then, the results of post-test II showed a very good increase, with all students, namely 32 students (100%), successfully reaching the Complete category. Thus, the classical completeness in cycle II reached 100%, exceeding the minimum success limit of 85% of students who obtained a minimum KKM score of 75, and was in the "Completed" category. Based on these achievements, the researcher concluded that student learning outcomes had improved in each cycle and had met the success criteria in cycle II. Thus, the hypothesis was accepted, namely "Learning outcomes can be improved through the application of the *Problem Based Learning model* assisted by *Mind Mapping* ". This is in line with the results of (Putri Fatimah, Muhammad Makki, 2022) that the application of the *Problem Based Learning model* assisted by *Mind Mapping* can improve student activity and learning outcomes.

Figure 1. Comparison of the Percentage of Student Learning Outcomes Completion in Cycles I and II

Discussion

Student learning activity

Based on the researcher's point of view and the results of the data obtained on the observation sheet, student learning activity showed an increase after the application of the Problem Based Learning model assisted by Mind Mapping, which can be seen from the comparison between cycle I and cycle II as described below.

In cycle I, observations were conducted during the implementation of the Problem Based Learning model assisted by Mind Mapping, which showed that students had not yet fully carried out their learning tasks optimally. Some findings include: (1) students had not yet noted down important points from the presented material, including; M. Rizky, Fazriadi, May Alpindo, Sarah, Maria, and Zurita, where the 6 students were seen

whispering to each other while the teacher was explaining the material; (2) there were still students who were not yet active in carrying out learning activities, including Adel, Agnita, Jhousa, and Jocelyne, where the 4 students did not raise their hands or even avoided eye contact when the teacher asked questions; (3) students had not read and studied the adjustment journal material from the textbook provided by the school, including Yesicca, Zahwa, Zhascia, and Resya; (4) students rarely asked questions; and still had difficulty in conveying ideas, concepts, and thoughts verbally, including Dinda, Fathiyah, Naomi, Nadyatus, and Naila, because these students did not dare to ask the teacher or friends about material they did not understand. Nevertheless, students have shown attention to the material presented by the teacher, and the teaching and learning process took place in a conducive atmosphere. As a follow-up, in cycle II the teacher made improvements to student learning activities by referring to the shortcomings that occurred in cycle I. These improvement efforts included: the teacher delivered the material with a more assertive and clear intonation, expression, and articulation; providing marks or underlining on important parts of the material; and providing motivation so that students were more enthusiastic in following the learning process. As a result, in cycle II there was a significant increase in student activity in the context of "carrying out learning tasks", indicated by: (1) students paid serious attention to the teacher's explanation; (2) students began to actively ask questions when they encountered difficulties understanding the material; (3) students noted important points when the teacher explained the adjustment journal material; (4) students sought additional information by opening the accounting handbook during the discussion session; and (5) students began to actively answer questions, express opinions, and ask questions. Thus, the score obtained in cycle I of 85 with a percentage of 66.40% increased in cycle II to 114 with a percentage of 89.06% (Nasution, 2021).

In cycle I with the application of the Problem Based Learning model assisted by Mind Mapping, it was seen that students were not yet fully able to apply problem solving optimally. Some of the obstacles that emerged included: (1) students were not yet able to provide ideal answers to the main questions, namely answers that should be clear, complete, and in accordance with the problems given, including Zahra, Adel, Dinda and Makayla. These students sometimes wanted to ask questions but were not yet fully brave enough to stand up and express their questions clearly and confidently because of anxiety and fear of being wrong; (2) students had difficulty in linking theoretical concepts with contextual problems in the questions, including M. Rizky, Najwa, Fazriadi and May Alpindo (3) students had not mastered the procedural stages in analyzing adjustment transactions, such as identifying accounts affected by transactions, grouping account types (such as assets, liabilities, capital, income, or expenses), applying the debit and credit recording system correctly (debit on the left side and credit on the right side), and calculating the total value of the accounts that experienced adjustments, including M.Ridho, Nazlah, Zurita and Thalita. However, in cycle I, students demonstrated active efforts in responding to learning, such as summarizing information from books and various other references, showing interest and enthusiasm in compiling mind maps, and engaging in group discussions in a comfortable and conducive manner (SALSABILA & MUQOWIM, 2024). As a follow-up, in cycle II, the teacher made improvements by adjusting the learning steps based on the weaknesses found previously. The improvements included a more comprehensive

explanation of each stage of problem-solving to all students, providing intensive guidance to each group, refining the worksheet format with more detailed and easy-to-understand questions, and adding specific time for each group to complete the task optimally. The results of these improvement efforts were seen in the increase in problem-solving activities in cycle II. Students began to show improved skills, such as: (1) compiling mind maps by dividing answers into small parts containing explanations, main ideas, and supporting ideas; (2) identifying relationships between points of information that had been collected; (3) explaining the relationship and implications of one idea to another; (4) accurately calculating the value of cash flow in each account in the form of journal entries; and (5) expressing creative ideas into narratives or coherent explanations in the form of concept maps. Quantitatively, the scores obtained by students increased from 86 points or 67.18% in cycle I to 111 points or 86.71% in cycle II.

In cycle I, the implementation of the Problem Based Learning model assisted by Mind Mapping showed that students were still unable to assess their own abilities and work results optimally. This was shown through several findings, such as: (1) students seemed hesitant when collecting their work results, including Naomi, Sarah, Resya and Khusnul; (2) some students were not able to assess whether the answers in their worksheets were right or wrong, including Maria, Sarah and Thalita; (3) some group members were not able to re-explain the answers they made themselves, including Resya, Yesicca and Jesseline; (4) only some students were able to identify their strengths and weaknesses, both cognitively and psychomotorically, in completing the task, including Adel, Jocelyne and Dina; (5) students tended to accept criticism or objections from other groups without providing further rebuttals or arguments to defend their answers, including Zhascia, Dina and Dinda (Hamdani, Nurhafsah, & Rustini, 2022). As a form of improvement in cycle II, the teacher made various efforts to improve students' ability to assess themselves based on the weaknesses found previously. These improvement steps include: the teacher provides a reflection session at the end of the lesson by conveying important points related to the adjustment journal topic so that students can evaluate their own learning progress, both in terms of knowledge and skills; the teacher also motivates students to be able to formulate learning objectives independently; and guides them to introspect on their own learning experiences, thought patterns, feelings, and actions. As a result of these actions, the learning process in cycle II shows a significant increase in activeness in the context of "assessing self-ability." Indicators of success include: (1) students show strong confidence in the accuracy and validity of the answers they provide; (2) students are able to re-explain their work without looking at notes; (3) some students even add further explanations to their work to clarify parts that are considered complex; (4) students are able to divide tasks according to their respective abilities because they already understand their strengths and weaknesses; and (5) students are able to convey logical arguments to refute objections from other groups and defend their work. Thus, the score achieved in cycle I was 82 with a percentage of 64.06%, increasing in cycle II to 114 or 89.06%.

In cycle I, during the implementation of the Problem Based Learning model assisted by Mind Mapping, it was seen that students were not fully able to apply the knowledge they had acquired in completing learning tasks. This was reflected in the following findings: (1) some students did not pay attention to the teacher's explanation during the presentation

session, even though mastery of the theory regarding adjustment journals was very important as a basis for producing quality answers, including Resya, Naomi, and Adel; (2) students were not yet able to apply theoretical concepts, as well as develop arguments, ideas, and concepts that had been learned into alternative solutions to adjustment journal questions, including Sarah, Maria, and May Alpindo; (3) many students still had difficulty in identifying important points from adjustment questions, including Yesicca Putri and Dinda; (4) students were not yet skilled at classifying transactions based on accounting theory, especially in the context of adjustment journals, including Adel, Naila, and Naomi; (5) there were doubts and errors in understanding the debit and credit mechanisms when compiling adjustment journal entries, including Zurita, Makayla, and Nadyatus; (6) Some students do not understand the difference between "expenses that have become expenses", "income that has become revenue", and "assets that have been written off or have become expenses" including Fathiyah, Fazriadi and Agnita; and (7) students are still not proficient in compiling problem-solving solutions using mind mapping including Dinda, Khusnul and Maria (Rahmawati, Setiawan, Finanda, & Susilo, 2024). In response to these problems, in cycle II the teacher made a number of improvements. The teacher intensified his role in guiding small groups so that students received direct assistance in asking questions, conveying ideas, and receiving input for improvement. The teacher also moved from one group to another to provide explanations and directions in solving problems more personally. As a result, the learning process in cycle II showed a significant increase in activeness in the aspect of "applying what he has learned in completing assignments". This is indicated by several indicators: (1) students began to understand the theoretical concept of adjusting journals better; (2) students are able to recognize important elements in complex transactions, such as debit and credit positions, transaction periods, classification of transaction types (assets, liabilities, equity, expenses, and revenue), nominal values that need to be adjusted, and approaches in preparing adjusting journal entries; (3) students can group transaction questions into categories of adjusting journal theory, such as adjustments to accrued or deferred income and expenses, equipment usage, depreciation of fixed assets, bad debts, and allowance for doubtful accounts (PBD); (4) students demonstrate skills in compiling problem solving through a series of fundamental questions and designing answers in the form of mind mapping flows; (5) students have understood and are able to systematically compile adjustment journal schemes through concept maps; and (6) the answers compiled are more focused, not long-winded, and directly to the core of the problem, so as not to deviate from the correct answer. Thus, the score obtained in cycle I of 83 or with a percentage of 64.84% experienced an increase in cycle II to 113 or with a percentage of 88.28% (Simangunsong, 2023).

Discussion of research results

Cycle I

The planning stage was carried out on Thursday, May 15, 2025, where the researcher consulted with the PAPJDM subject teacher, Mrs. Hariyanti regarding the implementation of actions in cycle I. In this process, the learning tools used were teaching modules adapted to the Independent Learning Curriculum (KMB), which were designed using the Problem Based Learning model with the help of Mind Mapping. The Learning Objective (TP) to be

achieved is at point 6, namely understanding the concept of adjusting journals. This objective is further detailed in the Learning Objective Flow (ATP), namely at point 6.1 explaining adjusting journal entries and 6.2 analyzing adjusting transactions. The learning material in cycle I focuses on adjusting journal entries for trading companies, which includes: the definition of adjusting journals, the importance of recording adjusting journal entries, the function and purpose of adjusting journals, the matching concept, and the basis of accounting. The teaching module is structured in three main stages, namely: (1) introduction, (2) core activities, and (3) closing. Next, the researcher prepared a Worksheet (LK) along with an evaluation answer key that will be used during the group discussion process. In addition, observation sheets, pre-test and post-test questions, answer keys, and assessment rubrics were also prepared to collect data related to student activity and learning outcomes (Sekarini et al., 2020).

At 12:15 WIB, at the end of the learning activity, the teacher guided students to first draw conclusions from the material that had been studied. Then Maria answered, "A trading company adjustment journal is a journal used to record adjustments to certain account balances at the end of an accounting period, so that it reflects the company's actual financial condition and performance." The teacher and students gave Maria a round of applause. Next, the teacher gave individual assignments to students as a form of follow-up to the learning, then closed the activity by inviting students to pray together and saying a closing greeting.

Based on the results of observations on learning activity and measurement of learning outcomes through tests, it is known that the implementation of actions in cycle I has not succeeded in achieving the predetermined targets, but learning outcomes have achieved the objectives but still need improvement for further improvement for more optimal results. This is caused by several factors, including: (1) at the investigation stage, students are more dependent on teacher instructions and are not yet fully active in seeking information or conducting literacy from various reference sources; (2) at the problem-solving stage, the preparation of mind mapping is only dominated by a small number of students; (3) Some students appear to be waiting for the teacher's instructions to start discussing, and are not yet accustomed to thinking independently. As a result of these various obstacles, the level of student learning activity in cycle I as a whole only reached 65.9%, which is still below the minimum completeness limit of ≥75%. Meanwhile, the completeness of student learning outcomes in cycle I reached 87.5%, which has met the established success indicator limit, namely a minimum of 85% of students obtaining a KKM score of 70 or more, but still needs to be improved to achieve more optimal results in the next cycle (Gultom, 2019).

Cycle II

At this stage, the teacher carries out corrective actions based on the results of the previous reflection, with the following steps:
   a. The teacher provides motivation and direction regarding the rules that must be obeyed during the learning process.
   b. The teacher revised the learning model used by outlining the steps in more detail, so that students do not have any room to deviate from the established learning procedures.

c. In answering fundamental questions, the teacher provides initial instructions, problem limitations, and key points to help students in the problem-solving process.

d. To enrich students' understanding of relevant concepts and ideas, teachers distribute additional reading materials in the form of e-books and provide students with the freedom to use smartphones as an alternative source of information.

e. During group discussions, the teacher distributes responsibilities and roles evenly among all members. Furthermore, each session is accompanied by a rotation of tasks, so that each student has the opportunity to understand all stages of problem-solving from start to finish.

f. To eliminate the negative stigma surrounding students who actively participate in learning, teachers reward those who participate. They also provide further motivation and guidance to foster awareness of the importance of active learning as part of realizing their dreams and aspirations.

g. To encourage students to be more confident in asking questions, teachers first provide example questions as role models, with a clear, coherent structure and relevant to the topic. Afterward, teachers provide opportunities for students to ask questions and provide step-by-step guidance if they encounter difficulties in posing their questions. This is important because some students still struggle to structure sentences or transform abstract ideas into concrete questions.

In cycle II, the implementation of the action was carried out twice a week. The first meeting took place on Friday, May 23, 2025, with a time allocation of 180 minutes (4 JP x 45 minutes). The learning activities in this meeting were divided into three stages, namely: (1) Introductory Stage, (2) Core Activity Stage, and (3) Closing Stage.

At 08.00 WIB, the teacher began the learning activities by greeting "Good morning!" and greeted the students. Next, the teacher invited one of the students, namely Fazriadi, to lead a prayer together. After the prayer was finished, the teacher checked attendance to find out the number of students present and their physical and mental involvement in participating in the learning process at school. Then, students were given initial information related to the material on preparing adjusting journal entries for trading companies. Next, the teacher conveyed the objectives and learning outcomes that students would obtain after carrying out the learning activities (Khoiriyah & Husamah, 2018).

Based on the results and discussion above, the author concludes that the average student learning activity in cycle I was 46.87%, increasing to 96.87% in cycle II. Meanwhile, for student learning outcomes, the classical mastery in cycle I was 87.5%, increasing to 100% in cycle II. This is in line with research findings (Aini & Lusita, 2019; Nurnaeni et al., 2021; Prihastuti & Ramadhani, 2020; Widodo & Listiadi, 2023; Wulansari et al., 2019) that the application of the Problem Based Learning model assisted by Mind Mapping can improve student activity and learning outcomes. Thus, it is concluded that the Problem Based Learning model assisted by Mind Mapping can improve student activity and learning outcomes.

CONCLUSION

Based on the research results and discussion, the following conclusions can be drawn:

1. The application of the Problem Based Learning learning model assisted by Mind Mapping can increase student activeness in accounting learning, especially in the

    learning objectives (TP) of adjusting journal entries for trading companies in class XI AKL SMKN 1 Medan.

2. The application of the Problem Based Learning learning model assisted by Mind Mapping can improve student learning outcomes in accounting learning, especially in the learning objectives (TP) of journal entries for adjusting trading companies in class XI AKL SMKN 1 Medan.

Suggestion

    Based on these conclusions, the researcher makes several suggestions, including:

1. It is recommended that PAPJDM subject teachers apply the Problem Based Learning model assisted by Mind Mapping as a variation of the learning model in class because: (1) learning is based on real problems, which are in accordance with the characteristics of accounting questions which are usually in the form of case studies of company activities; (2) it helps summarize important parts of the learning material into the form of concise notes, schemes, or concept maps, so that complex and interrelated accounting material is easier to understand.

2. For future researchers, it is recommended to apply the Mind Mapping-assisted Problem-Based Learning model to other accounting materials. Relevant sub-topics include account classification, transaction analysis, general journals, adjustment journals, general ledgers, and financial statements.

3. Implementing the Problem-Based Learning model with Mind Mapping is relatively time-consuming because it involves various stages, such as problem identification, theory development, analysis, problem-solving, and the creation of a coherent concept map. Therefore, this combination of models is best applied to subjects with a minimum time allocation of 3 learning sessions to ensure all learning steps are implemented in their entirety and without interruption.

4. For students who are less active or have difficulty understanding the material through this model, teachers are advised to provide additional reinforcement in the form of practice assignments (recitations), individual feedback, or learning assistance so that all students can achieve learning objectives equally.

BIBLIOGRAPHY

Aslam, L. K., Suparji, S., & Rijanto, T. (2021). The Effect Of Problem Based Learning Model On Learning Outcomes In The Vocational High School Students. *International Journal For Educational And Vocational Studies*, *3*(4), 264. Https://Doi.Org/10.29103/Ijevs.V3i4.3958

Ayu, Dewa, & Dewi. (2013). Pengaruh Metode Mind Mapping Terhadap Keterampilan Berfikir Kreatif Dan Prestasi Belajar Ips. *E:Journal Program Pascasarjana*, *3*.

Ayu, P. D., Atmadja, A. N. B., & Marhaeni. (2013). Pengaruh Metode Mind Mapping Terhadap Keterampilan Berpikir Kreatif Dan Prestasi Belajar Ips. *Jurnal Pendidikan Dasar*, *8*(1), 814–818.

Efstratia, D. (2014). Experiential Education Through Project Based Learning. *Procedia - Social And Behavioral Sciences*, *152*, 1256–1260. Https://Doi.Org/10.1016/J.Sbspro.2014.09.362

F. A, A. N., Asfar, A. M. I. T., & Asfar, A. M. I. A. (2020). Learning Design Based On Local Wisdom Maddawa-Dawa, Mammanu-Manu And Mappettuada. *Jtam (Jurnal Teori Dan Aplikasi Matematika)*, 4(2), 214. Https://Doi.Org/10.31764/Jtam.V4i2.2849

Ghofur, M. (2018). Penerapan Pembelajaran Mind Mapping Sebagai Upaya. *Jurnal Pendidikan*.

Gultom, S. P. (2019). Inovasi Model Pembelajaran Based Learning Berbasis Komputer Meningkatkan Kemampuan Pemecahan Masalah Pada Mata Kuliah Kalkulus. *Jurnal Stindo Profesional*, V, 44–52.

Gusteti, M. U., & Neviyarni, N. (2022). Pembelajaran Berdiferensiasi Pada Pembelajaran Matematika Di Kurikulum Merdeka. *Jurnal Lebesgue : Jurnal Ilmiah Pendidikan Matematika, Matematika Dan Statistika*, 3(3), 636–646. Https://Doi.Org/10.46306/Lb.V3i3.180

Hamdani, A. D., Nurhafsah, N., & Rustini, T. (2022). Pengaruh Penerapan Model Problem Based Learning (Pbl) Dalam Pembelajaran Ips Terhadap Kemampuan Berpikir Tingkat Tinggi (Hots) Pada Siswa Sekolah Dasar. *Journal On Education*, 5(1), 460–468. Https://Doi.Org/10.31004/Joe.V5i1.620

Handayani, T., Ismaya, E. A., & Ermawati, D. (2023). Peningkatan Kemampuan Berpikir Kreatif Siswa Sekolah Dasar Melalui Model Mind Mapping. *Motekar: Jurnal Multidisiplin Teknologi Dan Arsitektur*, 1(2), 50–57. Https://Doi.Org/10.57235/Motekar.V1i2.1105

Ismael, N. J., Putra, R. R., & Siregar, A. A. (2022). Project Based Learning-Computational Thinking (Pbl-Ct) Product Development In Mobile Programming Courses. *Journal Of Positive School Psychology*, 2478–2493.

Khoiriyah, A. J., & Husamah, H. (2018). Problem-Based Learning: Creative Thinking Skills, Problem-Solving Skills, And Learning Outcome Of Seventh Grade Students. *Jpbi (Jurnal Pendidikan Biologi Indonesia)*, 4(2), 151–160. Https://Doi.Org/10.22219/Jpbi.V4i2.5804

Lestari, F., Safa'udin, M., & Indrayany, E. S. (2018). Pengaruh Model Pembelajaran Think Talk Write Dengan Guided Concept Sentence Pada Matematika Smk Kurikulum 2013. *Jurnal Math Educator Nusantara: Wahana Publikasi Karya Tulis Ilmiah Di Bidang Pendidikan Matematika*, 4(1), 63. Https://Doi.Org/10.29407/Jmen.V4i01.11993

Masliah, L., Nirmala, S. D., & Sugilar, S. (2023). Keefektifan Model Pembelajaran Problem Based Learning (Pbl) Terhadap Kemampuan Literasi Dan Numerasi Peserta Didik Di Sekolah Dasar. *Jurnal Basicedu*, 7(1), 1–10. Https://Doi.Org/10.31004/Basicedu.V7i1.4106

Mukarima, U. S., Wawan, W., Setiawan, A., Ningsih, E. F., & Choirudin, C. (2024). Penerapan Model Pembelajaran Berbasis Masalah Dengan Media Pembelajaran Magic Board Untuk Meningkatkan Kemampuan Berpikir Kritis. *Jurnal Penelitian Tindakan Kelas*, 1(3), 152–155. Https://Doi.Org/10.61650/Jptk.V1i3.367

Nasution, I. A. (2021). Analisis Model Problem Based Learning (Pbl) Terhadap Kemampuan Pemecahan Masalah Matematika Siswa Sd/Mi. *Journal Of Islamic Primary Education*,

1(1), 10–20.

Novianti, A., Bentri, A., & Zikri, A. (2020). Pengaruh Penerapan Model Problem Based Learning (Pbl) Terhadap Aktivitas Dan Hasil Belajar Siswa Pada Pembelajaran Tematik Terpadu Di Sekolah Dasar. *Jurnal Basicedu*, 4(1), 194–202. Https://Doi.Org/10.31004/Basicedu.V4i1.323

Putri Fatimah, Muhammad Makki, U. (2022). Pengaruh Model Pembelajaran Problem Based Learning (Pbl) Terhadap Hasil Belajar Matematika. *Jurnal Pendidikan Sains Dan Komputer*, 2(02), 420–426. Https://Doi.Org/10.47709/Jpsk.V2i02.1796

Radina, A., Hamid, A., & Yusrizal. (2016). Penerapan Model Mind Mapping Berbasis Media Mindjet Mindmanager Untuk Meningkatkan Hasil Belajar Siswa Pada Materi Analisis Vektor Untuk Gerak Di Sman 12 Banda Aceh. *Jurnal Ilmiah Mahasiswa (Jim) Pendidikan Fisika.*, 1(4), 188–195.

Rahmawati, A., Setiawan, E., Finanda, R. P., & Susilo, B. E. (2024). Kajian Literatur: Peningkatan Kemampuan Pemecahan Masalah Matematis Siswa Melalui Model Problem Based Learning (Pbl) Berbantuan Media Camtasia Studio. *Prisma, Prosiding Seminar Nasional Matematika*, 7, 510–516.

Salsabila, Y. R., & Muqowim, M. (2024). Korelasi Antara Teori Belajar Konstruktivisme Lev Vygotsky Dengan Model Pembelajaran Problem Based Learning (Pbl). *Learning : Jurnal Inovasi Penelitian Pendidikan Dan Pembelajaran*, 4(3), 813–827. Https://Doi.Org/10.51878/Learning.V4i3.3185

Saputra, M. D., Joyoatmojo, S., Wardani, D. K., & Sangka, K. B. (2019). Developing Critical-Thinking Skills Through The Collaboration Of Jigsaw Model With Problem-Based Learning Model. *International Journal Of Instruction*, 12(1), 1077–1094. Https://Doi.Org/10.29333/Iji.2019.12169a

Sekarini, A. P., Wiyanto, W., & Ellianawati, E. (2020). Analysis Of Problem Based Learning Model With Mind Mapping To Increase 21st Century Skills. *Journal Of Innovative Science Education*, 9(3), 321–326. Https://Doi.Org/10.15294/Jise.V9i1.36843

Simangunsong, A. D. (2023). Implementation Of The Problem Based Learning (Pbl) Learning Model To Improve Skills Creative Thinking Of Students On The Material Coligative Properties Of Solutions. *Edunesia: Jurnal Ilmiah Pendidikan*, 4(2), 483–494. Https://Doi.Org/10.51276/Edu.V4i2.396

Simanjuntak, H. (2021). Perbandingan Model Pembelajaran Cooperative Tipe Talking Stick Dengan Mind Mapping Terhadap Hasil Belajar Siswa. *Jurnal Pendidikan Ips*, 2(1), 36–41.

Tri Pudji Astuti. (2019). Model Problem Based Learning Dengan Mind Mapping Dalam Pembelajaran Ipa Abad 21. *Proceeding Of Biology Education*, 3(1), 64–73. Https://Doi.Org/10.21009/Pbe.3-1.9

Vera, T. O., Yulia, P., & Rusliah, N. (2021). Peningkatan Kemampuan Pemecahan Masalah Matematis Melalui Model Problem Based Learning Dengan Menggunakan Soal-Soal Berbasis Budaya Lokal. *Logaritma : Jurnal Ilmu-Ilmu Pendidikan Dan Sains*, 9(01), 1–14. Https://Doi.Org/10.24952/Logaritma.V9i01.2782