




Research Article

Experimental Approach of The Problem-Based Learning (PBL) Method in Increasing Accounting Student Understanding of Budgeting Courses

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Abstract: One learning method that can be applied and, in many ways, proven to improve learning outcomes is the Problem-Based Learning (PBL) method. This research aims to analyze the effect of the PBL method on the Budgeting course and student learning outcomes (understanding of the Budgeting course). This research was carried out for six months at the Accounting Department of Politeknik Negeri Padang (PNP) and involved 57 students. The research method uses a quasi-experimental design, dividing the class into control (2A) and experimental (2B) classes, comprising 28 and 29 students, respectively. Research data was collected and analyzed using t-tests and questionnaires in the Budget course through 4 cycles (Cycles I, II, III, and IV). The results of the research after application using the PBL method were an increase in student understanding from cycle I with a value of 75.0% to 85.2% in cycles II and III, then in cycle IV, student understanding by 85.0%. Meanwhile, student learning outcomes in cycle I, namely 55% complete, increased significantly successively to 80%, 85%, and 87.5% complete in cycles II, III, and IV. The competency test score in the experimental class (90.17) is higher than that of the control class (69.35). This research concludes that the learning method with the PBL method can improve student understanding and learning outcomes in the Budgeting course for accounting students.

Keywords: accounting student; budgeting course; understanding; Problem-Based Learning; learning outcomes

1. Introduction

One of the accounting expertise courses is the Budgeting course. Budgeting is a compulsory subject offered to Politeknik Negeri Padang (PNP) accounting students in even semesters. The competencies expected in this course are that students can understand and apply budgeting concepts, have technical budgeting skills, and can use budgets as a tool. This Budget course discusses the concept of Budgeting as a planning and supervision tool in the company, both partially and comprehensively. The material in this course consists of three parts. The first part of Introduction to Budgeting covers the budgeting process, the basics of profit planning and control, and the comprehensive application of profit planning and control. The second part of the profit planning and control application includes planning and controlling sales, production, raw materials, and direct labor costs. The third part of the supporting analysis includes flexible budgets, planning and controlling capital expenditure and cash flow, profit volume cost analysis, and Comprehensive Budgeting.

Budgeting is one of the planning tools that help companies or individuals avoid unnecessary expenditures. It has also been developed to help achieve specific goals (Messer, 2017). Based on initial observations, D4 Accounting students often experience problems understanding the Budget course because there is still a lack of case practice, making it difficult for them to understand the Budget material as a whole, ultimately impacting their learning outcomes. Some students complained of difficulties in understanding budget cases. Therefore, appropriate learning methods are needed so that students can understand and apply the theory to overcome the reality in the field.

Learning methods are various ways lecturers systematically use to carry out learning

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efforts that have been processed (Danniarti et al., 2014). Learning methods consist of several types; some are conventional, and some are modern. The conventional learning method in the Budget course is lectures, student presentations, and practice questions. This method is less effective because students are considered less active, and communication only occurs in one direction (Suparta & Aly, 2003). Their exposure to the lecture material still did not provide a thorough understanding.

One of the learning methods that can increase student activeness is problem-based learning (PBL). PBL is a student-centered learning method and uses problem-solving as a starting point for learning (Newman, 2005; Beringer, 2007). PBL is designed to develop knowledge and skill-based problem-solving strategies for students to play an active role. The PBL method has been applied quite widely in several subjects, ranging from mathematics (Hidayah & Sutama, 2015) to science (Fauzan et al., 2017) to Fiqh (Saleh, 2013). The three studies prove that applying the PBL method positively influences the students in the research sample.

Until now, the PBL method has not been applied to the Budgeting course. Therefore, research on the effect of the PBL method on the budget course, the learning outcomes, and the academic load of D4 accounting students of PNP needs to be carried out. This research is expected to be part of the accounting research study that contributes to the curriculum planning process, learning process, and evaluation in education and teaching. This study aims to analyze the effect of the PBL method on the Budgeting course and student learning outcomes (understanding of the Budgeting course). How does implementing PBL as a teaching method in the Budgeting course affect the learning outcomes and understanding of accounting students at Politeknik Negeri Padang (PNP)?

2. Materials and Methods

2.1 Research Design

This research was conducted for six months, from March to August 2023. The first two months are used for research preparation or preliminary measurements, while the next four months are carried out for research observations. Research is grouped into four cycles, namely cycle 1 (4 meetings), cycle 2 (2 meetings), cycle 3 (3 meetings), and cycle 4 (4 meetings). This research was conducted at the Department of Accounting, D4 Accounting Study Program, in classes 2A and 2B, at the PNP. In the last experiment, researchers conducted competency tests and interviewed the teams involved, teaching teams, and students about applying PBL methods. The research procedures used in this study are as follows:

2.1.1 Preliminary Measurement Experiment

The research employed a quasi-experimental design, dividing the class into control (2A) and experimental (2B) classes, comprising 28 and 29 students, respectively. Both groups underwent pretest and posttest assessments, followed by treatment using PBL and traditional teaching methods. Despite similarities to a pure experimental design, the nonequivalent control group placement was randomized. An initial questionnaire was administered to both groups to assess baseline conditions related to the dependent variable, ensuring equivalence at the outset. This step aimed to mitigate initial differences between the groups, as both received the same questionnaire.

2.1.2 Implementation PBL method

At the implementation stage, the treatment is carried out using the PBL method, which involves students, lecturers, and researchers. Lecturers are perpetrators of manipulating the teaching and learning process; manipulation means providing treatment using the PBL method. The researcher acts as an observer who directly observes the process of giving manipulation.

The learning implementation in this study was carried out using the same learning outcomes in both the control and experimental groups. At this stage, there was a difference in treatment between the experimental and control groups. In the Budgeting course, the experimental group was given treatment using the PBL method, while the control group did not receive this treatment.

2.1.3 Final measurement

At this stage, the control and experimental groups were tested for competency and then interviewed using the same material for the teams involved, teaching teams, and students about applying PBL methods. This test aims to see the achievement of improved learning

No	Research Cycle	Student Understanding (%)	Student Learning Outcomes (%)
1	I	75.0	55
2	II	85.2	80
3	III	85.2	85
4	IV	85.0	87.5

3.2.1 Implementation of the PBL Method in Cycle I

3.2.1.1 Application of the PBL Method

The PBL method applied to the Budgeting course is followed by 4th-semester students. The material discussion at this stage includes the first cycle from 8 to 29 March 2023 (4 meetings) by discussing the Concept material in the Budget, including Sales Forecast, Sales Budget, and Production Budget. At the end of the cycle, an evaluation is held. So, in this first cycle, students learn the basic budgeting concepts.

Based on the results of observations made by the team in the first cycle at each meeting, several things were found, namely student activity sheets (assignments) need to be clarified so that students are not confused with the instructions given, students have not been able to analyze the problems that arise at meetings, time management is not according to plan, there are still many misconceptions among students, there needs to be specific techniques to motivate students to be active during learning and the learning process, And there are still students who are not focused on the learning process.

Problems encountered in the learning process become the collective responsibility of the team to find solutions. Improvements continue to be made at every stage, both in the learning tools and process. In addition, the team can learn from compiling learning plans during plan activities and observing the learning process so that it can be applied to the courses they teach. Thus, the PBL method can be a learning tool for lecturers involved so that the quality of learning can continue to be improved. This is very much in line with the opinion of Lewis (2002), who states that if a lecturer wants to improve the quality of learning, one of the most obvious ways is to collaborate with other lecturers to design, observe, and reflect on the learning.

3.2.1.2 Reflection of the PBL method

Exemplary lecturers and observers of the research team, the Budget teaching team, and representatives of other lecturers (departments) sat together in the meeting room (lecturer room) to reflect on the entire series of previous PBL activities, namely planning and implementing learning stages.

The results of the reflections and recommendations show that lecturers already understand the abilities and characteristics of students because they were taught classes last semester. According to Zubaedi (2011), character education is a deliberate effort through direction and guidance to help develop character so that a person behaves well according to moral values and diversity. The teaching skills of model lecturers are fully balanced because they are experienced in teaching this course, so it looks elementary and smooth to attract students' attention and explain the material. Students are enthusiastic about learning, but the collaborative model has not been honed well and needs to be repeated often so that students and lecturers are comfortable. According to Trianto (2021), the Learning model can also be interpreted as a pattern of choice, meaning the teacher can choose the appropriate learning model and efficiency to achieve educational goals. With the chosen learning model, the lecturer's voice and speech intonation are less loud, so they cannot control learning activities properly. Some students still lose concentration, are sleepy, and are unenthusiastic. Assignments in class and at home are not submitted on time (15% of the total population) despite being reminded. In conclusion, the process does not go well because students are not already conditioned.

Based on the results of the reflection above, several recommendations were produced so that the learning process can run according to plan. Namely, it is necessary to simulate first, especially when applying one of the learning models, because the technique does not yet recognize team teaching. Explanations of the tasks that must be done are carried out repeatedly until students understand and need to write assignments, not just delivered orally by lecturers so that students get guidance in carrying out the tasks given. Both the task type and submission time must be on time. Lecturers should guide students more through

questions that direct or guide them if there are obstacles in completing assignments. The teacher's intonation in learning must be adjusted to classroom conditions so that students can understand the lecturer's explanation well. Cooperation in groups must be further improved through the guidance of lecturers so that the groups formed effectively share knowledge. A student guides other students in his study group.

3.2.2 Implementation of the PBL method in Cycle II

3.2.2.1 Planning

The next PBL activity will be held from 5 to 12 April 2023 with two meeting sessions. The planning process is done by designing a learning model suitable for this cycle II material. Although there is limited time due to the Eid holiday, understanding the learning process is done through deeper discussions.

3.2.2.2 Applicability

The second cycle meeting began with material on BTKL, Raw Material Budget, and BOP Budget. This material begins with students learning the concepts of Raw Material Budget, BTKL, and BOP and practicing directly calculating the Budgeting as a Comprehensive Case. This material is presented by involving students with collaborative learning methods so that each student plays an active role in their responsibilities in their study group.

The learning process was that the lecturer explained material related to the Raw Material Budget, BTKL, and BOP using visual media in the form of ppt (PowerPoint) and asked students to study the material to be discussed in class before entering class. The class then applies a learning model through group discussions by discussing problems and answering questions in the Student Activity Sheet (MFI) and handbook. It can be seen that the class is very enthusiastic in answering questions from each group. If there is a problem during the implementation of the assignment by the student (the student appointed to complete the assignment in front of the class), if it is wrong, it will be discussed immediately. The reason is so that the error can be corrected immediately.

3.2.2.3 Reflection

The research team could not enter simultaneously due to the busy schedule. In fact, at the launch of the PBL research plan, it was explicitly requested that the research team and the Budget teaching team be given time apart from each other so that this research could be carried out optimally. However, the roaster team, who have tried their best, still have difficulty finding unlimited time. The solution is that the incoming class is held in tandem, and the observer team must be broken up. However, this does not reduce the effectiveness of the study.

The result of the reflection of this second cycle is that lecturers correct mistakes made at the perception stage, and MFIs in the form of practice questions are distributed. When answering questions, each group is given a chance. The student gets his turn, and if the student's name is called, the student comes to the front of the class, and if there is a mistake, the lecturer will immediately correct it. There was confusion in the early stages of the discussion because students did not understand the concepts, and the lecturer immediately encouraged students to work together in groups so that students could make good use of their friends' help. Lecturers give enough credit to students who actively ask questions and to successful groups.

Based on the results of the reflection above, several recommendations were produced through discussion. Namely, teaching preparation must be more mature, especially regarding the description of the learning process. This can be done through simulation first. Coordination between lecturers must be improved. The ability to master the material must be matured so that mastery of pedagogical material can be carried out correctly. Lecturers must strengthen students who answer questions and who ask questions

3.2.3 Application of the PBL method in Cycle III

3.2.3.1 Planning

After implementing UTS, the cycle resumes. The next PBL activity will be held from 24 May to 7 June 2023 with three meeting sessions. The planning process uses the Cost of Goods Produced and Cost of Goods Sold Budget and Marketing and General Cost Budgets.

3.2.3.2 Applicability

The third cycle meeting begins with providing material to students for group

presentations to the selected group. After the presentation, it continued honing students' ability to understand the material through cases related to topics in cycle III, namely Raw Material Budget, BTKL, and BOP Budget. This material begins with students learning the concepts of Raw Material Budget, BTKL, and BOP and practicing directly calculating the Budget as a Comprehensive Case. This material is presented by involving students with collaborative learning methods so that each student plays an active role in their responsibilities in their study group.

The learning process occurs when the lecturer explains material related to the Budget that is poorly understood and then provides cases to be solved. The case is then discussed in one meeting to determine which points students do not have to understand. If there is a problem during the implementation of the assignment by the student (the student appointed to complete the assignment in front of the class), if it is wrong, it will be discussed immediately. The reason is so that the error can be corrected immediately.

3.2.3.3 Reflection

The results of reflection in cycle III are that lecturers correct mistakes made at the perception stage, MFIs are distributed in the form of practice questions in sheets containing comprehensive cases related to the material, each group is allowed to answer questions, and students get their turn. When the student's name is called, the student comes to the front of the class, and if there is a mistake, the lecturer will immediately correct it. Lecturers give enough credit to students who actively ask questions and to successful groups.

3.2.4 Application of the PBL Method in Cycle IV

3.2.4.1 Planning

This IV cycle tests the application of PBL on four materials. The four materials discuss the Profit and Loss Budget, Cash Budget, Receivables Budget, and Comprehensive Budget. The cycle starts from 14 June to 8 July 2023. There is a gap of 1 week because classes cannot be held, but a replacement day can be found to continue learning.

In this cycle, matter becomes denser and more complex. Students are required to be able to make a comprehensive budget. The ability to prepare a comprehensive budget will help if the foundation of the Partial Budget concept is strong. However, by doing much exercise throughout the cycle

It is expected that students will be able to compile their Comprehensive Budget correctly. The final part of the cycle ends with a review of the material by giving UTS to provide an overview of UAS. The UTS questions are designed the same for all locales so that they can be evaluated comprehensively.

3.2.4.2 Applicability

The fourth cycle meeting begins with material by focusing students on solving cases/problems to gauge their understanding of the material.

3.2.4.3 Reflection

Reflection on this fourth cycle is that lecturers correct mistakes made at the perception stage. MFIs in the form of practice questions are distributed in sheets containing comprehensive cases related to the material. When answering questions, students are asked to work alone so that the results can be drawn. This cycle no longer involves groups because assessments focus on measuring personal abilities.

Lecturer skills in managing learning using problem-solving and discovery methods require lecturers to be able to guide student work in learning actively (Wena, 2013). They also can ask, guide (probing), respond to student questions, and answer with answers that help students use their thinking skills and manage student activities in groups.

Lecturers should create learning scenarios to anticipate possibilities that arise during the learning process, even though certain things may happen outside the scenarios that have been prepared. The ability to guide group work, control student activities, and demonstrate ability must be optimized by deepening material mastery ability. However, these skills do require more specific training.

3.3 Final experiment

After all, PBL activities in the final two cycles had been completed (cycles III and IV), researchers were tested for competency. The mean result of the competency test is shown in Table 3, and the independent t-test for the two groups is shown in Table 4.



Table 3. The mean results for the competency test on control and experimental groups

Group Statistics					
	Class	N	Mean	Std. Deviation	Std. Error Mean
Competence	2A (Control)	28	69.3571	15.89832	3.00450
	2B (Experimental)	29	90.1724	12.55863	2.33208

Table 4. The competency test results were obtained using an independent t-test on control and experimental groups

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Competence	Equal variances assumed	.591	.445	-5.496	55	.000	-20.81527	3.78767	-28.40593	-13.22461
	Equal variances not assumed			-5.473	51.358	.000	-20.81527	3.80337	-28.44956	-13.18098

Table 3 shows that the average competency test score in the experimental class (90.17) is higher than that of the control class (69.35). After carrying out the t-test, it was proven that the PBL treatment in the experimental class was significantly different from the control class (Table 4). The results of implementing the PBL method in the classroom indicate a consistent improvement in students' abilities with each cycle. This aligns with Barrows' (1996) assertion that PBL is a student-centered learning approach that fosters active engagement and critical thinking by introducing real-world problems as the foundation for learning. Preparation of materials and PBL techniques before implementation in the classroom is crucial to ensure that students are not confused by the new method being introduced. As Neville (2009) suggests, adequate preparation is necessary to ensure students and instructors comprehend their roles, objectives, and problem-solving processes involved in PBL.

Last, they interviewed the teams involved, including teaching and students, about applying the control and experimental groups. This activity benefits lecturers because it increases knowledge about collaborative learning strategies and can train students' critical thinking skills. At the end of the fourth cycle session, researchers suggested improving student academic achievement by increasing student motivation in solving budget cases, completing assignments given to students, and increasing student discipline in the learning process. Students are advised to increase positive activities and reduce harmful activities in each negative learning to achieve better learning outcomes. Department leaders or heads use various methods and performances to improve student learning activities.

For future research, it is recommended that implementing the PBL method be enhanced to improve accounting students' academic performance and abilities. This can be achieved by boosting students' motivation to tackle budgeting cases, completing assigned tasks, and fostering discipline during learning. Students should increase positive engagement and reduce negative behaviors during each learning session to achieve better learning outcomes. Additionally, departmental leaders are encouraged to explore diverse teaching methods to enhance the learning engagement of accounting students.

5. Conclusions

In conclusion, the preliminary measurement results indicated no significant differences

in the understanding of the questionnaire between the experimental and control groups, ensuring a balanced starting point for implementing the PBL method. Throughout the implementation of the PBL method in four cycles, a consistent improvement in students' comprehension and learning outcomes was observed. The progression in understanding the PBL method was evident, with an initial comprehension level of 75.0% in cycle I, increasing notably to 85.2% in cycles II and III and maintaining a high level at 85.0% in cycle IV. Additionally, there was a significant enhancement in student learning outcomes, with the average completion rate increasing from 55% in cycle I to 87.5% in cycle IV. During the implementation of the PBL method, various challenges and reflections were encountered, leading to recommendations for improvement. These included the need for better teaching preparation, coordination between lecturers, mastering of pedagogical material, and refinement of teaching techniques to enhance student engagement and understanding. Looking ahead, it is suggested that implementing the PBL method be further enhanced to improve accounting students' academic performance and abilities. This can be achieved by boosting student motivation, fostering discipline, and exploring diverse teaching methods.

Additionally, departmental leaders are encouraged to support the implementation of innovative teaching strategies to enhance student learning engagement. In summary, implementing the PBL method has shown promising results in enhancing students' comprehension and learning outcomes in the Budgeting course. However, continuous improvement and exploration of effective teaching strategies are necessary to ensure sustained progress and optimal learning outcomes for accounting students.

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