The Effect of Project-Based Learning and Self-Efficacy on Accounting Learning Achievement

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Abstract. 21st-century education demands creativity, critical thinking, collaboration, and communication skills. All these skills aim to support the development of highly competitive human resources. There are three objectives of this study: first, analyzing the comparison of accounting learning achievement of students who follow different instructional models (project-based learning and direct instruction); second, analyzing the comparison of students' accounting learning achievement who have different levels of self-efficacy (high and low); and third, describing the interactive influence between two dimensions of instruction models and two dimensions of self-efficacy to students' accounting learning achievement. This quasi-experimental design is a nonequivalent control group design. The access population of this study was nine classes taking accounting courses. The sample was determined randomly and all samples were separated into two experimental groups and two groups were designated as controls. Data related to self-efficacy were obtained through a questionnaire, and learning achievement was assessed using an essay test. The collected data was analyzed using descriptive and inferential statistics with α=0,05. The results of this study are (1) there are differences in students' accounting learning achievement between those who studied using the PjBL model and the DI model; (2) there are differences in students' accounting learning achievement between students with different levels of self-efficacy; (3) the instructional models accommodate self-efficacy to enhancing students' accounting learning achievement.

Keywords: Direct Instruction, Project-Based Learning, Student's Self-Efficacy

1 Introduction

The Indonesian government is trying to improve the quality of its education, such as improving the adaptive curriculum and learning standards by involving universities. Efforts that universities can make are to encourage students to succeed in the cognitive, affective, and skills domains. Real conditions show that many educational problems still occur. The problem that dominates education in Indonesia is the education system which is not yet adaptive and the results are reflected in learning outcomes. Factors contributing to problems in education include unwise use of ICT

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and global student activities. This problem will impact on learning achievement (Sari, 2017). The final measure of the learning process is learning outcomes. A learning outcome is the final result of the teaching and learning process in three domains: knowledge, attitude, and skills obtained from learning activities that have been carried out. Good learning will show learning achievement in a very good category that applies to every course, including accounting practical courses. The low achievement of accounting learning is caused by several factors, including passive students, lack of self-confidence, and lack of freedom to develop their knowledge. Low learning achievement is because the learning model provided could be more optimal and is still conventional. Learning achievement in the accounting course is still relatively low, most of which are below the completion standard. Based on the final grades obtained by students, only 55% got a B or above; the rest were still below the completion standard. Another statement that supports this is the results of an interview with the course instructor who stated that the results of the practicum could be more optimal. Inappropriate instructional models and those that do not suit students' characteristics will affect their learning achievement. The implementation of inappropriate learning models also influences the low learning achievement of students. This is by the results of interviews with lecturers who teach the course, which stated that the decline in learning achievement was influenced by inappropriate learning models. In addition, the teaching and learning process in accounting practical courses uses the Direct Instruction model which tends to position the lecturer as a source of scientific authority. This model allowed students to learn to observe, remember, and imitate according to the model of their lecturer. This is to the behaviorist view, which means that learning is merely memorizing facts presented in the form of learning materials in other words, learning is the acquisition of knowledge. The consequence is that the learning objectives, structuring of the material, and communication of the material are the lecturer's responsibility.

The problem needs to be solved through changes in the learning process in the accounting practical course. One thing that can be changed is that the model applied must be by the understanding and characteristics of the accounting course. The characteristics of this course dominated practice, so it requires skills in doing it. Therefore, a learning model that emphasizes case-solving, problem-solving, and final solutions in the form of projects is needed. Following the specifics of the course, students must play an active role in the learning process and must have the ability to record transactions. Based on the description above, the instructional model that is appropriate to the subject characteristics is an instructional model that emphasizes the product and students' abilities in solving problems faced in investigation projects. The learning model that can accommodate these activities is a model that provides students with full opportunities to express their ideas in an activity, one of which is the Project-Based Learning (PjBL) model. PjBL can be defined as an instructional model that provides learners with the opportunity to form knowledge based on their knowledge (Craft & Capraro, 2017). The consequence of implementing this model is that students become more active and have high academic involvement while studying.

Various research results on implementing the PjBL in improving students' achievement in several fields. The implementation of the PjBL model, assisted by multimedia PowerPoint, is effective in improving student learning outcomes (Cahyaningsih et al., 2020). Furthermore, students' learning achievement is higher if they learn with the Project-based learning model compared to when they learn with direct instruction (Santyasa et al., 2020). Based on this research, it can be said that the implementation of the PjBL model is expected to be able to improve students' accounting learning achievements. The success of implementing an instructional model can be influenced by the characteristics of students who follow the models. Self-efficacy is one of the characteristics of students that has the potential to influence the effectiveness of the PjBL model. Students must be able to design and make decisions if they want to implement project-based learning. The higher the self-efficacy, the greater the students' efforts and endurance or persistence in solving the problems given (Amanda et al., 2014). Students who have a high or adequate self-efficacy will work on project assignments with full responsibility, diligently, tenaciously, and exert all their efforts and abilities to complete them. Therefore, students with such conditions will carry out the stages of the PjBL model well, which has an impact on achieving optimal learning. Meanwhile, students with inadequate self-efficacy assume that something is more difficult than it is, so students reduce their efforts and persistence in solving problems (Warsito, 2012). In the PjBL model, students with inadequate self-efficacy are likely unable to execute or complete projects and less able to fully answer the given issues. This will hinder the model from being programmed for students and will have an impact on learning outcomes that are not as expected.

The success of students in mastering a learning material is caused by their beliefs, which cause them to behave in such a way that these beliefs will become reality. A person's self-efficacy is defined as the belief in the ability of an individual to determine and carry out various actions needed to produce an achievement (Bandura, 1997). Students who have self-efficacy will tend to do activities they believe can be done rather than doing work they feel cannot be completed. Self-efficacy possessed by students can be seen based on three aspects, namely: (a) the level aspect, (b) the strength aspect, and (c) the generality aspect (Bandura, 1997). Education supported by digital game design positively contributes to student learning achievement and independence in coding (Bozan & Taşlıdere, 2024). Self-efficacy is a determining factor of success in attempting a task. In the field of education, the role of self-efficacy is to change behavior that will result in increased performance during learning (Kolil et al., 2020). These findings indicate that self-efficacy affects students' learning achievement so it must be considered in enhancing the learning quality, including in accounting subjects. The conclusion about the impact of the PjBL model and self-efficacy on learning achievement is not yet clear. Therefore, the researcher conducted further research and testing to describe the influence of the PjBL model and self-efficacy on accounting learning achievement.

2 Methodology

In implementing and testing the effectiveness of these instructional models, researchers conducted experiments. The research design used to reveal the cause-and-effect relationship is the nonequivalent pretest-posttest control group design (Tuckman, 1978). This study used a two-factor measurement technique in a 2×2 factorial version. This study uses an analysis design with a by-level design approach with the differentiating factor being self-efficacy as a moderator variable. The separation is divided into two levels: above the group average (33% above) and below the group average (33% below). This study involves three variables namely: learning achievement, self-efficacy, and project-based learning. Self-efficacy data were collected through questionnaires, and students' learning achievement was assessed using essay tests. The ideal minimum score for both variables is 0, and the ideal maximum score is 100. The data analysis technique used is parametric bivariate statistics. The research hypothesis was tested by analysis of variance (ANOVA) assisted by the SPSS 25.00 for the Windows program with a significance level of 0.05. Each cell consists of 25 subjects, so the total number of subjects is 100. The analysis design between the instructional model dimensions and the self-efficacy dimensions is revealed in Table 1.

Table 1. Design of analysis

Self-efficacy dimensions	Project-based learning model (X1)	Direct instruction model (X2)
High (Y1)	X_1Y_1	X_2Y_1
Low (Y2)	X_1Y_2	X_2Y_2

3 Result and Discussion

3.1 Result

Interpretation and categorization of study results using the 2023 PNB Director Regulation, concerning PNB education regulations. Table 2 presents the average score of students' learning achievement in various dimensions of the instructional model and levels of self-efficacy. Table 2 shows that the average score of students' learning achievement with adequate self-efficacy is 56-60 ("low enough" category). Conversely, students with inadequate self-efficacy are in the range of scores of 41-55 in the "low" category. Generally, the pretest scores of students who followed the PjBL and DI were in the same range of values as the "low" category. The score of 47.72 is the lowest score obtained by students with inadequate self-efficacy and they follow the DI model. After being given treatment (posttest), as shown in Table 2, the posttest scores of all student groups are in the "very high" category, especially those with adequate self-efficacy and following the PjBL model and the score is 90.64. The

lowest score obtained was 83.40 for students who have a low or an inadequate degree of self-efficacy and follow the PjBL model.

Table 2. Average learning achievement

Self-efficacy	Instructional model	Mean (pre-test)	Mean (post-test)	Analysis unit
High	Project-based learning (PjBL)	56.76	90.64	25
High	Direct instruction (DI)	60.60	83.33	25
Low	Project-based learning (PjBL)	49.76	83.40	25
Low	Direct instruction (DI)	47.72	84.20	25

Before testing the hypothesis, it is necessary to conduct an analysis requirement test to obtain empirical facts about the normality of data and homogeneity of variance. The normality test uses the Kolmogorov-Smirnov and the Shapiro-Wilks test. The analysis of data normality on all units of analysis (four groups) shows a significance greater than 0.05. Therefore, the dependent variable data is normally distributed overall. Homogeneity of variance to test the equality of variance of each group being compared. Levene's Test of Equality of Error Variances tests the homogeneity of variance between groups. The homogeneity of variance test was conducted in two groups: first, grouping based on learning models (PjBL and DI) with 50 units of analysis; second, grouping based on self-efficacy (high and low) with 50 units of analysis. The homogeneity test showed that the data groups came from populations with the same variance (homogeneous). Testing all hypotheses expressed using 2x2 factorial ANOVA. The analysis used SPSS 25.0 for Windows and a summary of the test is presented in Table 3. Table 3 explains several things. First, the source of the instructional models obtained a $F=6.027$, $\alpha<0.05$ ($\alpha=0.016$). That means, the learning models variable significantly affects learning achievement variables. Second, the source of the self-efficacy obtained a $F=8.125$, $\alpha<0.05$ ($\alpha=0.005$). These results indicated that self-efficacy significantly affects students' learning achievement. Third, the influence of students' self-efficacy with the instructional models, the value of $F=9.697$ is obtained with a significant number of 0.002 (smaller than 0.05). The results suggest that the learning model variables can integrate self-efficacy significantly to improve learning achievement. Learning achievement can be achieved more highly for students with a high or adequate degree of self-efficacy if the PjBL model is applied.

Table 3. Summary of ANOVA

Source	Mean square	F	Sig,
Instructional model	222.010	6.027	0.016
Self-efficacy	299.290	8.125	0.005
Instructional model * self-efficacy	357.210	9.697	0.002

Meanwhile, learning achievement decreases for the students who have a low or an inadequate degree of self-efficacy when the PjBL model is used. That means the PjBL is more appropriate to be programmed for groups of students with adequate self-efficacy. On the contrary, the DI model is more suited to be implemented for students with inadequate self-efficacy.

3.2 Discussion

Differences in Students' Accounting Learning Achievement Viewed from The Models Perspective. The study shows that the students who learn using the PjBL model and learn using the DI model obtain different accounting learning achievements. The results stated that the achievement of accounting learning achievement was greater if they studied with the PjBL model rather than studying oriented using the direct instruction syntax (F=6.027, sig. 0.016). This study is consistent with the findings of previous research. The PjBL can enhance students' learning achievement (Alamri, 2021). The paradigm of the PjBL model is that all students are given full opportunity to form their knowledge, discover their knowledge, study concepts in depth, and, at the same time, improve their learning outcomes. Interaction can occur effectively in the PjBL model by utilizing the investigation process by directing students to create or develop products related to everyday life (Hernáiz-Pérez et al., 2021). In its implementation, PjBL has the following syntax: (a) determining essential questions, (b) designing planning of the project, (c) creating the schedule, (d) monitoring students and the progress of the project, (e) asses the outcome, and (f) evaluating the experiences. The syntax is suitable to be applied to humanize humans; change the paradigm of lecturers as facilitators, motivators, mediators; and create a joyful learning atmosphere. In PjBL, accounting practicum learning activities are fully facilitated so that the syntax or stages in implementing the PjBL model can be carried out optimally.

Different from students who learn with the DI model. DI model is learning that is centered on lecturers (teacher center), students as good listeners, and time efficient so that teaching materials are delivered more widely. The syntax in the DI model is as follows: (a) gain attention, explain the material. (b) provide material, (c) instruct students about the material, (d) test students for the material, and (e) instruct students for independent learning (Arends, 2014). The application of the DI model in accounting practicum courses is focused on delivering material on managing journals (recording stage). The DI model begins with preparing the material and conveying the learning objectives of the accounting practicum. The lecturer delivers material on transaction recording techniques using the lecture method and demonstration of transaction recording techniques. Students listen to the lecturer's explanation, practice, and ask questions that still need to be understood. In the DI model, (a) learning is centered on the lecturer, (b) explanations and modeling are following the lecturer's knowledge and experience, and (c) guiding. Consequently, students need more knowledge, so cognitive learning achievement is less trained. The DI model does not yet provide students with the freedom to create their knowledge. In addition,

the DI model does not stimulate student motivation in finding knowledge. Conditions such as the above cause students' cognitive knowledge to be less than optimal. In essence, the DI model emphasizes lecturer-centered learning, while PjBL provides opportunities for students to participate in solving real problems and constructing knowledge in an authentic professional context. Based on this explanation, the implementation of the learning model oriented towards PjBL syntax is more successful than that oriented towards DI syntax in improving students' accounting achievement.

Differences in Accounting Learning Achievement based on Levels of Self-Efficacy. The testing results using ANOVA analysis show that differences in students' self-efficacy levels cause their accounting learning achievements to differ (F=8.125, sig. 0.005). Self-efficacy is a person's belief in their ability to plan, organize, and execute actions to achieve predetermined goals (Bandura, 1997). Achieving goals in learning requires self-confidence, but many students need self-confidence. Self-efficacy will develop well if students have self-confidence; self-confidence will affect student learning achievement. Students who have adequate self-efficacy have more confidence in being competent in carrying out their duties and are more motivated to attend class (Zientek et al., 2019). Students with adequate self-efficacy tend to choose paths that require performance, persist in doing assignments, and continue facing difficulties (Bandura, 1997). Students with inadequate self-efficacy explain their inability by the influence of external circumstances (Erturan et al., 2020). Students who have adequate self-efficacy can face threats based on their competencies (Hung et al., 2021). Meanwhile, students with inadequate self-efficacy do not have learning motivation, do not have learning independence, and tend to be pessimistic. The adequacy of students' self-efficacy in carrying out accounting practices is correlated with their cognitive knowledge. Students who have inadequate levels of self-efficacy feel tormented by burdensome learning tasks, while students who have adequate levels of self-efficacy will be diligent and motivated to complete learning tasks. Differences in the levels of students' self-efficacy are reflected in differences in their learning achievements. So, it can be stated that self-efficacy influences students' learning achievement, especially in accounting practice courses.

Interactive Effect between Instructional Models and Self-Efficacy on Learning Achievement. The test of the interactive influence between the instructional models (PjBL-DI) and self-efficacy (high-low) on accounting learning achievement is shown by the value of F=9.697, sig.<0.05. These results are supported by research that states that PjBL can improve student learning outcomes and self-efficacy (Krsmanovic, 2021). Students who can construct their knowledge can increase self-efficacy. PjBL can improve students' self-efficacy to achieve better learning achievement (Samsudin et al., 2020). This means that PjBL versus self-efficacy influences students' learning achievement. PjBL can accommodate students' self-efficacy by allowing them to explore the material themselves, conduct collaborative experiments, and complete the assigned tasks. This proves that the PjBL model accommodates self-efficacy in

improving learning achievement. However, the application of the DI model makes students passive. This condition causes students' self-efficacy to not affect their learning achievement. PjBL requires students to design and complete projects so students become creative and constructive. Students who have adequate levels of self-efficacy are better accommodated when participating in PjBL compared to students who have inadequate levels of self-efficacy. Students who have inadequate levels of self-efficacy are better accommodated if they follow the DI model compared to the PjBL model. This interaction is supported by research that found that the instructional model can accommodate student self-efficacy in improving student learning achievement (Amini et al., 2019). The ability of instructional models to accommodate self-efficacy to improve accounting learning achievement is demonstrated by awareness, independence, and self-confidence in applying the syntax of instructional models. Student self-awareness is very high in the PjBL model because it makes students active in learning. Compared to PjBL, in the DI model, students tend to be passive, so students' self-awareness could be better. Independence in the PjBL model, students are required to complete projects, and indirectly, self-efficacy will be formed. In the DI model, self-efficacy does not have too much influence on learning achievement because students are passive. Self-confidence in the PjBL model can be seen in students' ability to complete the given project. Students who have an adequate level of self-efficacy are more confident in solving a problem. Meanwhile, to solve the same problem, students who have inadequate levels of self-efficacy tend to be less confident in solving it. The PjBL model accommodates the level of self-efficacy by solving problems related to real problems. In contrast, in the DI model, students are only passive; therefore, students' self-efficacy does not have much influence on their learning achievement.

4 Conclusion

It is concluded that: (1) The students' accounting learning achievement who study with a project-based learning model significantly differs from those who study with a direct learning model. The students' accounting learning achievement based on problems is higher than those who follow the direct instructional model. (2) The accounting learning achievement of students with an adequate level of self-efficacy is significantly different from that of students with an inadequate level of self-efficacy. The accounting learning achievement of students with an adequate level of self-efficacy is higher than those with inadequate levels of self-efficacy. (3) Self-efficacy is integrated into the instructional model to improve students' accounting learning achievement. Students with adequate levels of self-efficacy participate better in improving students' accounting learning achievement if they apply project-based learning. Meanwhile, those who have inadequate levels of self-efficacy have a better learning program using the direct instruction model.

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