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Analysis of the Role of Project Based Learning in Improving Students' Problem-Solving Skills in Entrepreneurship Courses at Universitas Negeri Makassar

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Abstract: This study aims to analyze the effect of the implementation of Project Based Learning on students' problem-solving abilities in the Entrepreneurship course at Universitas Negeri Makassar. This study uses a quantitative approach with an explanatory research type. The study population was 627 students of Universitas Negeri Makassar, class of 2023, 2024, and 2025. The research sample of 86 respondents was determined using proportional random sampling technique. Data collection was carried out through observation, questionnaires, and documentation, while data analysis used descriptive analysis, instrument testing, classical assumption testing, and hypothesis testing. The results showed that the implementation of Project Based Learning and students' problem-solving abilities were in the high category. In addition, the implementation of Project Based Learning was proven to have a positive and significant effect on students' problem-solving abilities. These findings indicate that the better the implementation of Project Based Learning, the higher the students' problem-solving abilities in entrepreneurship learning.

Keywords: Problem-Solving; Project-Based Learning; Skills; Students.



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A. Introduction

Higher education plays a crucial role in developing human resources who can think critically, innovatively, and responsively to real-world problems in the workplace. A key competency required for students, particularly in economics and business, is problem-solving skills. In the context of entrepreneurship education, problem-solving skills are a key competency because entrepreneurs face dynamic, uncertain situations that demand innovative solutions.

Problem-solving skills can be defined as a person's ability to identify and understand problems, develop steps or strategies for resolution, implement those strategies, and reassess the effectiveness of the solutions obtained. In higher education, this ability serves as an indicator of learning success because it reflects the extent to which students can apply theoretical concepts to real-world problems. In entrepreneurship education, problem-solving skills play a crucial role and are closely related to students' readiness to face the challenges of the business world. Entrepreneurship courses are not merely oriented toward providing students with conceptual understanding but also require them to identify opportunities, manage risks, and resolve various business issues. A study by Lombardi et al. (2022) explains that students with strong problem-solving skills tend to be more capable of developing business plans and making strategic decisions independently. This shows that low problem-solving skills can influence less than optimal entrepreneurship learning outcomes.

This situation indicates the need to implement a learning model that encourages active student participation while simultaneously developing their problem-solving skills through a structured approach. One type of teaching considered effective in enhancing problem-solving skills is Project-Based Learning (PjBL).

PjBL is a teaching method that positions students as the focus of study activities through the completion of relevant and meaningful assignments. Through this model, students have the opportunity to learn through direct experience in completing projects that require critical thinking, collaboration, and problem-solving skills.

Theoretically, the relationship between PjBL and problem-solving skills can be understood through the doctrine of constructivism, which emphasizes that students construct insights independently through study activities. In PjBL, students are directly involved in the process of identifying and solving problems, resulting in in-depth knowledge construction. Research by Fitriani and Arifin (2021) confirms that PjBL can create a learning environment that encourages critical thinking and problem-solving skills through authentic project-based activities.

Makassar State University, in particular, has designated entrepreneurship as a compulsory course for students. This course is designed to develop students' entrepreneurial spirit through applied skills aligned with the business world. In practice, the Project-Based Learning (PjBL) model has begun to be implemented in entrepreneurship courses, but its implementation has not been fully optimized and consistent across all classes, particularly among students in the 2023, 2024, and 2025 intakes.

Based on preliminary data obtained through questionnaires distributed to 30 Makassar State University students who have taken the Entrepreneurship course, the implementation of Project-Based Learning (PjBL) achieved an average percentage of 74%, which is in the good category, while problem-solving skills achieved an average percentage of 68%, which is in the moderate category. These results indicate that PjBL implementation has been successful, but not yet fully optimal, particularly in aspects of project implementation and teamwork. Furthermore, students' problem-solving skills still need to be improved, particularly in indicators of strategy implementation and solution evaluation. This situation indicates a gap between the relatively good implementation of PjBL and students' problem-solving abilities, which have not yet developed optimally.

Theoretically, PjBL is believed to improve problem-solving abilities through project-centered learning and real-world experiences. This is supported by research by Siregar (2022), Agustin (2022), and Mustagin (2024), which shows that PjBL is effective in improving learning outcomes, analytical skills, entrepreneurial attitudes, and problem-solving skills at various levels of education. However,

research on the effect of PjBL implementation on problem-solving abilities in Entrepreneurship courses at the tertiary level, particularly among students at Makassar State University, is still limited. Therefore, this study was conducted to analyze the effect of PjBL implementation on students' problem-solving abilities as a basis for optimizing the entrepreneurship learning process.

B. Literature Review

1. Project Based Learning (PjBL)

Project-Based Learning (PjBL) is based on the doctrine of constructivism, which emphasizes that students construct knowledge independently through study activities. In this learning process, students play an active role in planning and implementing projects related to real-life problems, fostering critical thinking and problem-solving skills. According to Yunita et al. (2022), project-based learning models can increase student motivation by directly engaging them in meaningful and challenging activities. Projects developed through PjBL (Problem-Based Learning) do not simply focus on final outcomes, but also emphasize learning that enables students to develop critical and reflective thinking skills. Therefore, PjBL is considered an effective approach to enhancing independent learning, teamwork, and creative and systematic real-world problem-solving skills.

The success of PjBL implementation is influenced by several interrelated factors. PjBL requires careful planning and institutional support, as complex projects require time, resources, and intensive mentoring to enable students to effectively manage the learning process. Syam and Suharto (2023) explains that technological support, communication between group members, and a collaborative culture are factors that significantly influence the effectiveness of PjBL implementation in higher education settings. In the context of modern learning, technology integration, such as the use of a Learning Management System (LMS) and digital-based collaboration, are essential components of project implementation. Therefore, lecturers need to create a conducive learning environment and encourage students to actively participate at every stage of the project.

2. Problem Solving Skills

The complex thinking process individuals use to systematically address new problems, from identifying the problem, devising alternative solutions, implementing strategies, selecting the best course of action, and evaluating the results (Indrayani et al., 2022). Pratiwi et al. (2023) explain that this ability is reflected in students' ability to use thought processes to solve problems by gathering facts, information, and various alternative solutions to determine the most effective solution. Furthermore, this ability focuses not only on the final result but also on the sequence of thoughts involved in solving the problem (Hasyim et al., 2019).

Problem-solving ability is closely related to critical thinking skills. Shogren and Wehmeyer (2017) explain that in the problem-solving process, individuals are required to develop and express important ideas, evaluate complex ideas, and avoid errors in decision-making. Thus, critical thinking is not merely a supporting element but an integral component of problem-solving ability because it helps individuals analyze problems and determine solutions rationally.

Furthermore, problem-solving ability is defined as an individual's ability to identify problems and analyze information. Problem-solving ability is classified as a higher-order thinking process skill that emphasizes analytical and reflective abilities. In line with this, states that problem-solving skills involve critical thinking, creativity, and reflection, and are developed through active learning and a learning environment that supports the exploration of ideas and open discussion. In higher education, problem-solving skills are an essential competency that students must possess (Wang et al., 2023).

Problem-solving ability is influenced by various internal and external factors. Mutagin (2024) suggests that critical thinking skills, creativity, learning experiences, and a learning environment that supports exploration are the main factors influencing students' problem-solving abilities. Critical thinking and creativity help students analyze problems logically and generate innovative solutions, while meaningful learning experiences enable students to connect theory to real-world problems. Furthermore, a conducive learning environment that provides

space for discussion and collaboration encourages active student involvement in the problem-solving process. Internal factors such as interest and motivation also play a significant role in encouraging students to think openly and demonstrate persistence in facing problems, as well as striving to find optimal solutions.

C. Methods

This study used a quantitative approach with an explanatory research design to analyze the effect of Project-Based Learning (PjBL) implementation on students' problem-solving skills in the Student Entrepreneurship course at Universitas Negeri Makassar. The study population consisted of 627 students from the classes of 2023, 2024, and 2025 who had taken the Entrepreneurship course. The sample consisted of 86 students selected using proportional random sampling so that each class had a proportional opportunity to participate.

Data were collected through questionnaires, observation, and documentation. The research instrument used a five-point Likert scale. Project-Based Learning variables were measured through five indicators: project planning, teamwork, utilization of learning resources, project implementation, and presentation of project results. Meanwhile, problem-solving skills were measured using five indicators: problem identification, root cause analysis, designing alternative solutions, implementing problem-solving strategies, and evaluating the results.

Data analysis was conducted using IBM SPSS Statistics version 29. The analysis stages included descriptive statistical analysis to describe the characteristics of the data, instrument quality testing through validity and reliability tests, classical assumption testing including normality and heteroscedasticity tests, and simple linear regression analysis to test the effect of Project Based Learning on students' problem-solving abilities. Hypothesis testing was conducted using the t-test, while the magnitude of the contribution of the independent variables to the dependent variable was analyzed using the coefficient of determination (R^2). All statistical tests were conducted at a significance level of 5%.

D. Result and Discussion

1. Results Validity Test

Table 1. Results Validity Test X and Y

Variable	r_{count}	r_{table}	Results
Project Based Learning	0,636	0,213	Valid
	0,633		Valid
	0,748		Valid
	0,631		Valid
	0,634		Valid
	0,468		Valid
	0,580		Valid
	0,615		Valid
	0,587		Valid
	0,723		Valid
Problem Solving Skills	0,740	0,213	Valid
	0,796		Valid
	0,755		Valid
	0,701		Valid
	0,765		Valid
	0,437		Valid
	0,663		Valid
	0,724		Valid
	0,599		Valid
	0,663		Valid

Based on Table 1, it is proven that all points in the PjBL factor and case resolution capacity have a higher r -value than the standard r (0.213), so all expression points in this analysis are considered valid. This case proves that each parameter is able to measure the examined factor appropriately, so it is suitable for use in subsequent studies.

2. Results Reliability Test

Table 2. Results Reliability Test X and Y

Variabel	Cronbach's Alpha	Criteria	Results
Project Based Learning	0,825	> 0,60	Reliabel
Problem Solving Skills	0,876		Reliabel

Based on Table 2, it is proven that the Cronbach's alpha coefficient for each factor (factor X and factor Y) has a value > 0.60. Then, each factor expression is valid and reliable, and all expression points in each factor can be used for examination in the data collection process.

3. Simple Linear Regression Analysis Test

Table 3. Results of Simple Linear Regression

Coefficients ^a					
Model		Unstandardized Coefficients		Standardized Coefficients	t
		B	Std. Error	Beta	
1	(Constant)	8.178	3.657		2.236
	Project Based Learning	.746	.089	.676	8.415

a. Dependent Variable: Kemampuan Pemecahan Masalah

Based on table 3, the constant value of 8.178 shows that if the implementation of Project Based Learning (X) is 0, then the problem-solving ability (Y) is 8.178. The regression coefficient value of 0.746 shows that the implementation of Project Based Learning has a positive impact on problem-solving ability. This means that every increase in the implementation of Project Based Learning by one unit increases problem-solving skills by 0.746. The significance value <0.001 is smaller than 0.05, so it can be concluded that the implementation of Project Based Learning has a significant effect on problem-solving ability.

4. Results Hypotesis Test

Table 4. Results Hypotesis Test

Coefficients ^a					
Model		Unstandardized Coefficients		Standardized Coefficients	t
		B	Std. Error	Beta	
1	(Constant)	8.178	3.657		2.236
	Project Based Learning	.746	.089	.676	8.415

a. Dependent Variable: Kemampuan Pemecahan Masalah

Based on the data in Table 4, the implementation of the Project Based Learning method has a very real impact on the problem-solving skills of students at Makassar State University. This phenomenon is proven by the acquisition of a score of 8.415 accompanied by a significance level below 0.05, which indicates that the significance benchmark is indeed below the threshold of 0.05. The null hypothesis H_0 is declared invalid and the alternative hypothesis H_a is declared valid, so that the final conclusion is that the execution of

this project-based learning has a significant effect on students' problem-solving capacity.

5. Results of the Analysis of the Coefficient of Determination (R^2)

Table 5. Results Coefficient of Determination

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.676 ^a	.457	.451	3.60931

a. Predictors: (Constant), Project Based Learning

Based on Table 5, which contains the results of the coefficient of determination test (Model Summary), the R value indicates a close correlation between the implementation of Project Based Learning and students' problem-solving skills. Furthermore, the R Square value of 0.457 indicates that the Project Based Learning implementation variable is able to explain 45.7% of the variation in students' problem-solving skills, while the remaining portion, 54.3%, is caused by other aspects outside the scope of this study. Furthermore, the Adjusted R Square value of 0.451 represents that after adjustments to the total sample and the variables studied, the explanatory power of the Project Based Learning variable on students' problem-solving skills is 45.1%.

Discussion of Research Results

Based on the findings of the study, it was found that the implementation of the PjBL model had a positive and significant impact on the problem-solving abilities of students in the entrepreneurship class of the Accounting Department at Universitas Negeri Makassar. This was demonstrated by the results of a practical linear regression test, which showed a regression coefficient of 0.746 with a significance level of <0.05, and a t-test result of 8.415. Therefore, the hypothesis proposed in this research was confirmed.

Referring to the results of the simple linear regression analysis, the equation model $Y = a + 0.746X$ was obtained. This formulation illustrates that each additional unit of PjBL implementation will increase students' problem-solving capacity by 0.746 units. The positive regression coefficient confirms a positive relationship between the PjBL variable and problem-solving abilities. Furthermore, the 8.415 value, which exceeds the

t-table, and the significance score below 0.05, proves that the impact is statistically significant. These findings indicate that PjBL has a concrete function in improving students' problem-solving skills.

The results of this study show that the better the implementation of the PjBL learning model, the higher the students' problem-solving skills. A positive regression coefficient indicates that the relationship between the two variables is unidirectional, whereby improving the quality of PjBL implementation will be followed by improved problem-solving skills. Empirically, these findings align with field conditions, which show that students who are actively involved in project activities are able to identify problems, analyze their roots, and design solutions more systematically.

Conceptually, the study findings support constructivism, which asserts that insights are formed independently through the activity of acquiring knowledge. In PjBL, students participate in the process of identifying and solving problems, resulting in a deeper construction of knowledge. Through activities such as project planning, teamwork, and presentation of results, students are trained to think critically, analyze information, and make independent decisions. Thus, PjBL not only improves conceptual understanding but also fosters the development of concrete problem-solving skills.

The results of this study also align with previous studies that have shown that PjBL is effective in improving problem-solving skills. A study by Siregar (2024), showed that the implementation of PjBL can improve students' learning outcomes and analytical skills. Furthermore, research by Mustagin (2024), also demonstrated that PjBL has a significant impact on problem-solving skills. These consistent results reinforce the idea that PjBL is an effective learning model for various levels of education, including higher education, particularly in entrepreneurship education, which demands critical thinking and problem-solving skills.

Therefore, the analysis and discussion of this study demonstrate that the implementation of PjBL positively contributes to improving students' problem-solving skills. The more optimal the implementation of PjBL in

entrepreneurship education, the better students' ability to identify problems, analyze alternative solutions, and make appropriate decisions to resolve them.

E. Conclusion and Recommendation

Based on the research results and discussion, it can be concluded that the implementation of Project-Based Learning (PjBL) has a positive and significant impact on students' problem-solving abilities in entrepreneurship courses at Universitas Negeri Makassar. This learning model encourages students to actively participate through project-based activities that provide real-world experience in identifying problems, analyzing information, and formulating appropriate solutions. Therefore, the more optimal the implementation of Project-Based Learning, the stronger the students' problem-solving abilities in facing various learning situations.

Based on these research findings, lecturers are expected to optimize the implementation of Project-Based Learning as a learning strategy, particularly in entrepreneurship courses, to enhance students' problem-solving abilities. Students are also expected to actively participate in every stage of project-based learning to maximize the development of critical thinking and problem-solving skills. Furthermore, the university is expected to support the implementation of this innovative learning model by providing supportive facilities, infrastructure, and policies. Future researchers are advised to expand their research by adding other variables that could potentially influence problem-solving abilities to obtain more comprehensive and in-depth results.

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