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Project Based Learning (PjBL) Model in Improving Students' Ability to Design Thesis Proposals

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ABSTRAK

Kemampuan mahasiswa dalam menyusun proposal penelitian menjadi sasaran pembelajaran metodologi penelitian. Penerapan model Project Based Learning (PjBL) dalam pembelajaran Metodologi Penelitian berupaya memberikan pengalaman langsung kepada mahasiswa dalam menyusun proposal penelitian. Penelitian ini bertujuan untuk Tujuan penelitian ini untuk menganalisis tingkat efektifitas penerapan model PjBL dalam meningkatkan kemampuan penyusunan proposal skripsi. Penelitian ini dilakukan menggunakan metode eksperimen berbentuk Pretest-Posttest Control Group Design. Subjek penelitian adalah kelas belajar mata kuliah metodologi penelitian Program Studi PPKn FKIP sebanyak 2 kelas (R01 dan R02). Data penelitian berupa skor N-Gain, yaitu skor peningkatan kemampuan merancang proposal skripsi setelah penerapan model PjBL. Data dianalisis menggunakan teknik statistic komparatif independent sample t-test. Hasil analisis menunjukkan bahwa Model PjBL cukup efektif digunakan dalam pembelajaran Metode Penelitian Kuantitatif karena mampu meningkatkan kemampuan mahasiswa dalam menyusun proposal skripsi yang lebih besar dibandingkan dengan metode konvensional. Implikasi dari hasil penelitian ini terhadap pembelajaran Metodologi Penlitian Kuantitatif dengan menugaskan mahasiswa membuat projek berupa proposal penelitian akan menguatkan pemahamannya secara konseptual dan kemampuannya dalam merancang proposal penelitian apabila dikelola secara sistematis berdasarkan model PjBL.

ABSTRACT

Students' ability to prepare research proposals is the target of learning research methodology. Applying the Project Based Learning (PjBL) model in Research Methodology learning seeks to provide students with direct experience in preparing research proposals. This research aims to determine the effectiveness of implementing the PjBL model in improving students' abilities in preparing research proposals. This research was conducted using an experimental method: a Pretest-Posttest Control Group Design. The research subjects were 2 classes studying the research methodology course of the PPKn FKIP Study Program at Jambi University (R01 and R02). Class R02 was used as the experimental class and R02 as the control class. The research data is in the form of an N-Gain score, namely a score for increasing the ability to design a thesis proposal after implementing the PjBL model. Data were analyzed using comparative statistical techniques and independent sample t-tests. The results of the analysis show that the PjBL Model is quite effective in learning Quantitative Research Methods because it can improve students' ability to prepare a thesis proposal that is greater than conventional methods. The implications of the results of this research for learning Quantitative Research Methodology by assigning students to create a project in the form of a research proposal will strengthen their conceptual understanding and ability to design research proposals if managed systematically based on the PjBL model.

1. INTRODUCTION

A research proposal is a research design that will be used by researchers to obtain data/information and report it in the form of a thesis. A research proposal is a form of design that contains various components for research preparation (Daniel & Taneo, 2019; Moleong, 2018). Research proposals also function to communicate research plans to supervisors and sponsors (Mustikasari et al., 2023). In

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general, the contents of a proposal contain three main parts, namely the problem, benefits and objectives of the research, literature review, framework for thinking and formulation of hypotheses, research design to obtain and analyze research data (Arono et al., 2021). Compiling a research proposal is the first step for students in completing their final assignment or thesis. Not a few students experience difficulties in completing their final assignments because they are unable to design a research proposal. This low ability is motivated by both internal factors (lack of understanding the content of the research proposal, lack of support for writing support (computer/laptop), low motivation to complete it) and external factors (active in social and religious activities, married and other family activities) (Daniel & Taneo, 2019; Misa & Lasi, 2022). Other external factors that often hinder students from completing their thesis are lengthy procedural requirements and lecturer guidance patterns that are always changing (Asmawan, 2016). In general, the level of difficulty for students in completing their final assignment lies in the difficulty of submitting the title, the guidance process, collecting and processing data, exams and revising the thesis (Kocimaheni et al., 2020).

This problem is a typical problem that must receive attention to get the best solution from all parties, including students themselves, lecturers and academic administrators (Rosyad, 2019). Writing research proposals at FKIP Jambi University is based on thesis writing guidelines which are regulated based on the 2018 academic regulations. Based on these guidelines, the components of a research proposal consist of Chapter 1, namely background, problem identification, problem formulation, benefits and objectives of the research, operational definition." Chapter 2 is a study of theory, previous research, framework, hypothesis. Chapter 3 is place and time of research, research design, population and sample, sampling techniques, data collection techniques, validation of research instruments, data analysis techniques. The success of preparing a thesis proposal will determine the success of completing a student's final assignment. Therefore, students must understand each part contained in it, such as the background of the problem, problem solving and the methods used (Nas et al., 2019). The ability to compose a research proposal is not only determined by understanding the concept of research methodology, but requires the skill to express it in written form. Therefore, learning orientation must prioritize the ability to design research proposals which focuses on mastering the skills of writing, designing and organizing concepts in the form of a draft proposal. Expertise will be formed through practice and direct involvement in preparing research proposals. Based on observations in the Study Program, only a small number of students (2%) out of 80 people were able to complete their final assignments on time. This phenomenon also occurs at the University of East Indonesia, even though students have studied research methodology, their ability to complete their thesis is still low (Nurhayati, 2013). Learning research methods has not been integrated with the preparation of a thesis proposal so that its usefulness does not contribute significantly to the completion of the final assignment (Junaedi et al., 2015). On the other hand, the Covid-19 pandemic that has occurred for + 2 years has had an impact on the learning process not being optimal so that students have difficulty completing their thesis (Saraswati et al., 2021).

There are several causes of students' low ability to compose theses, including students' low reading culture, lack of understanding of essential research problems, minimal mastery of theory to support references, lack of understanding in formulating research problems, students' low culture of scientific writing, understanding of methodology and skills in preparing proposals. low number of students, the learning process does not facilitate students in designing research proposals. The learning process is dominated by lecturers in the form of lectures and questions and answers, so that students' opportunities to be directly involved in writing research proposals are reduced (Ardimen et al., 2019). Internally, students' difficulty in completing their thesis is due to the lack of learning facilities, such as laptops or computers and low motivation to complete it, while externally it is caused by family factors (Daniel & Taneo, 2019). Another factor that often causes students to have difficulty completing a thesis is expressing ideas into scientific writing and mastering statistical techniques in processing data and narrating it in the form of verbal sentences (Rismen, 2015). Learning that facilitates students being directly involved in producing a product is a project-based learning model with the aim of finding a solution to a problem. The form of learning model that is relevant to the demands of research methodology learning is the Project-Based Learning (PjBL) model. The Project Based Learning (PjBL) model is a learning model that facilitates students to construct and collaborate in finding solutions to problems to build new knowledge (Elisabet et al., 2019; Nurcahyono, 2023; Tika & Agustiana, 2021). Through the PjBL model, it allows students to study a topic by collaborating with other students (Putra et al., 2021; Rahayu & Sukardi, 2021). This model is to produce products obtained from developing knowledge and skills through inquiry (Fauzia & Kelana, 2021; Sagita et al., 2022). Through this learning method, students' psychomotives will increase. In PjBL, learning is designed and realized systematically so that students play an active role in completing learning projects so as to produce quality products

(Atminingsih et al., 2019; Pratama, 2023). Project selection should be based on students' interest in producing the products needed for learning. The PjBL model in learning in higher education is a learning model that has certain characteristics (Fauzia & Kelana, 2021; Nurhidayah et al., 2021). Based on the 2013 curriculum, the characteristics emphasize students, determining the topic of a project, formulating the problem to be studied, designing appropriate methods to find solutions to problems that have been raised, regular collaboration in studying problems to find solutions by accessing and managing existing information, carrying out work evaluations. continuously, reflect on work results periodically, evaluate the products produced qualitatively, prioritize a tolerant attitude in responding to errors and changes that occur in learning (Deviana & Kusumaningtyas, 2019; Magdalena et al., 2020). In the PjBL model, the role of lecturers is to facilitate, train and direct students in producing products according to their imagination, creativity and innovation (Fauzia & Kelana, 2021; Tiantong & Siksen, 2013). The PjBL model allows the development of student characteristics, such as research skills, self-confidence, responsibility and collaboration which are built through completing projects both individually and in groups (Nurhidayah et al., 2021; Prawati & Ramadan, 2023).

Through this model, students will be directly involved in preparing research proposals, so that students are not only seen as learning objects but act as subjects. Students will be more active in searching for information, studying theories and exploring data to find solutions to problems. Various research results prove that there is an increase in students' skills from the application of the PjBL model, through the application of the PjBL model increases students' ability to express ideas to solve a problem. Previous research findings stated that the PjBL model in learning Research Methodology forms good abilities in preparing research proposals (Fitriyah et al., 2021). By using the PjBL model in learning research methodology, students gain direct experience from the tasks (projects) they are working on so that their understanding increases significantly (Ardimen et al., 2019; Prawati & Ramadan, 2023). By implementing the PjBL model, students get a great opportunity to do assignments in the form of learning projects. Choosing a learning model that suits student characteristics and learning topics will increase student learning success (Kuswanto et al., 2022). In this research, testing the effectiveness of the PjBL model was carried out by comparing the increase in the ability to prepare a thesis proposal for the experimental class with that of the control class. Improvement in the ability to prepare a thesis proposal is measured based on the N-Gain score. This form of experiment and analysis technique was not carried out in previous studies. Based on the problems and urgency of applying the PjBL model in learning research methodology as explained above, it needs to be studied in depth through research to determine the level of effectiveness of the model in increasing students' ability to prepare a thesis proposal. The aim of this research is to analyze the level of effectiveness of implementing the PjBL model in improving the ability to prepare a thesis proposal through a comparative study of the learning outcomes of the experimental class taught using the PjBL model with the control class taught using the conventional model.

2. METHOD

This research was carried out using quantitative methods in the form of experimental research, namely testing the PjBL model in Research Methodology learning to improve students' abilities in preparing research proposals. The form of experiment used is a Quasi Experimental Session which is based on the Pretest-Posttest Control Group Design, namely using two classes where one class is an experimental class taught using the PjBL model and a control class taught using conventional methods. The research subjects were the learning classes of the Quantitative Research Methodology course of the PPKn Study Program in 2 classes (R01 and R02). Class R01 was used as the experimental class and class R02 as the control class. Based on the form of experiment used, namely True Experimental Design which is based on Pretest-Posttest Control Group Design, the effectiveness of implementing the PJBL model is measured using the N-Gain Score, namely comparing the average difference in student learning outcomes after and before the experimental class with the control class (Creswell, 2016). If the value is ≥ 0.70 in the high category, $0.3 \leq g \leq 0.7$ in the medium category, and $g < 0.3$ in the low category (Banawi et al., 2019);(Prahani et al., 2018);(Sesmiyanti et al., 2019). Measuring students' ability to prepare a thesis proposal is based on the results of the thesis proposal project assessment. The provisions for assessing thesis proposals refer to the Jambi University FKIP thesis writing guidelines as presented in Table 1.

Table 1. The Thesis Proposal assessment grid

No	Rated aspect	Indicators
1	Background	- Explain the reasons for choosing the problem - Problem identification is supported by data and facts - Realistic and measurable problem boundaries

		- The specific problem formulation is related to the aspect being researched, in accordance with theory, in accordance with the development of science, formulated using interrogative sentences - The research objective is in accordance with the problem formulation and is written in a statement sentence - The benefits of research are in accordance with the problem formulation and research objectives, consisting of practical and theoretical benefits - The operational definition explains the terms of the research variables
2	Theoritical review	- Theoretical studies explain the concept of each variable studied and its indicators as well as the relationships between variables - The study of previous research results strengthens the explanation of concepts, indicators and relationships between variables - Theoretical studies guide hypothesis testing - The thinking framework integrates theory and research results into one unified concept based on deductive logic that will answer problems - A hypothesis contains a temporary answer based on the theory that has been studied
3	Research methods	- Reveal the specific place and time of research and present it in a diagram - The research design explains the types, types and reasons for their selection - The population and sample are clearly defined, use relevant techniques, and the reasons are substantiated - Data collection techniques are explained in detail and are realistic in collecting data - Data analysis techniques are in accordance with statistical techniques based on the objectives to be achieved
4	Literature review	- References are written according to standard APA style using the Mendeley program
5	Similarity Test	- Maximum similarity test tolerance 30%

Statistically, the effectiveness of the model needs to be proven at the level of significance using the independent sample t test with the condition that the data is normally distributed and homogeneous (Gerald, 2018). If tcount is greater than ttable at an alpha of 5% then there is a significant difference in the N-Gain score in the experimental class and the control class so it can be concluded that the PjBL model is effective in improving students' ability to prepare research proposals.

3. RESULT AND DISCUSSION

Result

This research was conducted to test the level of effectiveness of the PjBL model in learning quantitative research methods in improving students' ability to prepare a thesis proposal. To achieve this goal, research was conducted using a quasi-experimental method with a Pre-test-Post-test Control Group design. Through this design, learning is carried out in two groups, namely the experimental class which will be treated in learning Quantitative Research Methods using the PjBL model, and the control class as a comparison using conventional learning methods. The target to be achieved in learning quantitative research methods is the level of student ability in designing a thesis proposal. The application of the PjBL model in learning quantitative research methods is carried out in five stages. The first question begins by asking basic questions about how to determine the right research topic or title, design the research background, formulate the problem, and determine the benefits and objectives of the research; how to make relevant theoretical studies, formulate a framework of thinking and research hypotheses; and how to create a research design, determine the research population and sample, design research instruments and data analysis techniques. The second stage tasks students with designing a thesis proposal. The third stage guides students to prepare a schedule for preparing a thesis proposal. The fourth stage monitors student work and progress. The fifth stage assesses the results of student work. Learning quantitative research methods in the control class is carried out conventionally. This learning method emphasizes lectures and questions and answers in carrying out learning in class. During the lesson, the lecturer explains the concept and mechanism for preparing a proposal starting from the title, research

background, problem formulation, benefits and research objectives, conducting theoretical studies, formulating hypotheses, research design, determining research hypotheses and samples, research instruments and data analysis techniques. The application of the PjBL model in learning Quantitative Research Methods directs students to create a learning project in the form of a thesis proposal containing research background, theoretical studies and research methods. Before the PjBL model is applied in learning, students are assigned to design a thesis proposal outline as a basis for measuring students' initial abilities in preparing a thesis proposal. The measurement is based on assessing the suitability of the thesis proposal writing with the guidelines used as a learning reference shown in Table 2.

Table 2. The Description of Pre-Test Data on Level of Capability in Preparing Proposals

Intervals		Category	Experiment		Control	
			F	%	F	%
81	100	Very high	0	0.00	0	0.00
61	80	Tall	5	16.13	1	3.23
41	60	Currently	14	45.16	19	61.29
21	40	Low	12	38.71	11	35.48
1	20	Very Low	0	0.00	0	0.00
Amount			31	100	31	100

Based on Table 2, the majority (45.16%) of students in the experimental class had their ability level in compiling a thesis proposal in the medium category in the 41 – 60 score interval and most of the others (38.71%) were in the low category. There are only 16.13% of students whose ability to prepare a thesis proposal is in the high category. Likewise in the control class, the level of ability in preparing a thesis proposal for the majority (61.29%) of the students was in the medium category, and most of the others (35.48%) were in the low category, and there were 3.23% of students whose abilities were in the tall. The application of the PjBL model in learning Quantitative Research Methods begins with an explanation of the concepts and procedures for preparing a thesis. Some basic questions that must be answered by students through the thesis proposal preparation project are how to determine the research title, how to formulate the research background, how to conduct a theoretical study of the variables to be researched, how to determine the research method, and how to write a list of references. The preparation of the thesis proposal project is carried out in 4 meetings or 1 month independently. The determination of individual work is intended so that all students can be directly involved in the process of preparing a thesis proposal. Student collaboration is built through discussion of project results in class. The discussion process involves all students and lecturers in providing input and questions as a basis for improving and perfecting the project. The revised final project is used as a reference for assessing students' level of ability in preparing a thesis proposal as shown in Table 3.

Table 3. The Description of Post-Test Data on Level of Ability to Prepare Experimental Class Proposals

Intervals		Category	Experiment		Control	
			F	%	F	%
81	100	Very high	13	41.94	5	16.13
61	80	Tall	17	54.84	20	64.52
41	60	Currently	1	3.23	6	19.35
21	40	Low	0	0.00	0	0.00
1	20	Very Low	0	0.00	0	0.00
Amount			**31**	**100**	**31**	**100**

Source: Primary data processed, 2023

Based on Table 3, the majority (54.84%) of students in the experimental class have high abilities in preparing a thesis proposal. There are 41.94% in the very high category, and there are only 3.23% of students whose abilities are in preparing a thesis proposal. In the control class, the majority (60%) of students' ability level in preparing a thesis proposal was in the high category. There are 16.13 percent of students whose ability to prepare a thesis proposal is in the very high category, but there are also 19.35 percent of students whose ability is still in the medium category. The level of effectiveness of implementing the PjBL model in learning Quantitative Research Methods is determined from the ratio of increasing students' abilities in preparing a thesis proposal which is expressed in the NGain score, as shown in Table 4.

Table 4. The Description of NGaint Score Data

Class	Min	Mak	Mean	Skewness	Kurtosis
Experiment	37.92	95.18	64.72	0.22	-0.99
Control	30.36	76.12	49.39	0.55	-0.37

Based on Table 4, the minimum ability score for students in the experimental class in preparing a thesis proposal is 37.92 and the maximum is 95.19 with an average of 64.72. This average value explains that the application of the PjBL model in learning Quantitative Research Methods is quite effective in improving students' ability to prepare a thesis proposal. In contrast to the control class which was taught using the conventional model, the average level of improvement in students' ability to prepare a thesis proposal was only 49.39 so it was considered less effective. The NGain score data for both the experimental and control classes has a normal distribution because the skewness and kurtosis ratio values to the standard error are in the range -1.96 to +1.96 so they can be used to explain the characteristics of the data. The level of normality of the data is also strengthened by the results of the Shapiro Wilk test which shows that the sig value of the NGain data for the experimental class is 0.29 and the N-Gain for the control class is 0.15, which is greater than the alpha value of 0.05, as seen in Table 5.

Table 5. N-Gaint Score Data Normality Test Results

Class		Shapiro-Wilk		
		Statistics	df	Sig.
Ngain	Experiment	0.96	31	0.29
	Control	0.95	31	0.15

Source: Primary data processed, 2023

The level of significance of comparing the effectiveness of the PjBL model with the conventional model in improving students' ability to write their theses was carried out by a comparative statistical independent sample t-test of the two NGain score values, as shown in Table 6.

Table 6. The Independent Sample T-test Score N-Gaint Test Results

N-gain	t	df	Sig. (2-tailed)
Equal variances assumed	4.23	60	0.000
Equal variances not assumed	4.23	55.91	0.000

Source: Primary data processed, 2023

Based on Table 6, the calculated t value of 4.23 is greater than the t table value at alpha 5%, which is 2, so it can be concluded that there is a significant difference in increasing students' ability to prepare a thesis proposal taught using the PjBL model with the conventional model. . This level of comparison also indicates that the application of the PjBL model in learning quantitative research methods has a significant effect on students' ability to prepare a thesis proposal.

Discussion

Research findings show that there is a significant difference in the increase in students' ability to prepare a thesis proposal taught using the PjBL model and the conventional model. This level of comparison also indicates that the application of the PjBL model in learning quantitative research methods has a significant effect on students' ability to prepare a thesis proposal. The Project Based Learning (PjBL) model is a learning model that facilitates students to construct and collaborate in finding solutions to problems to build new knowledge (Maira et al., 2022; Putri et al., 2023). Through the PjBL model, it allows students to study a topic by collaborating with other students. The essence of the PjBL model is to produce products obtained from the development of knowledge and skills through inquiry (Mabruroh, 2019; Syafira, 2022). Through this learning method, students' psychomotives will increase. The application of the PjBL model in learning Quantitative Research Methodology is intended so that students have the ability to prepare a thesis proposal through the resulting project. The PjBL model is carried out in stages and systematically, starting from asking basic questions, designing a project plan, preparing a project implementation schedule, monitoring student work and its progress, assessing the results of student work (Tan & Chapman, 2016). By working on a thesis proposal project, students are

required to develop their knowledge about the concepts or methods of writing a thesis and implement them in the form of real work to produce a thesis proposal.

The research results showed that students who were taught using the PjBL model experienced a higher increase in ability in designing thesis proposals compared to students who were taught using conventional methods. The results of this research prove the level of procedural effectiveness of the PjBL method applied in learning Quantitative Research Methods. Through this model, students are faced with the outcome that will be achieved in learning, namely a thesis proposal so that students are required to understand and master the procedures from various sources needed to produce this outcome. In working on a project, students are guided by the lecturer so that they are directed towards completing a product or thesis proposal that is in accordance with writing guidelines. Student collaboration in working on projects is facilitated through class discussions to provide input and suggestions for project improvements. Through learning syntaxes that are carried out based on the PjBL model, students can effectively master the concepts and techniques for preparing a thesis proposal. Project-based learning requires students to think critically and creatively in implementing concepts in the form of real work. In contrast to the conventional method which only emphasizes mastering concepts through lectures and questions and answers in learning Quantitative Research Methods, students are less facilitated in designing a thesis proposal, either through guidance or collaboration with other students so that even though they have mastered the understanding, they lack the skills in designing a thesis proposal.

The findings of this research are strengthened by the findings of previous research stating that learning using the PjBL method can improve students' critical thinking skills and creativity (Anazifa & Djukri, 2017; Sumarni & Kadarwati, 2020). The application of the PjBL model in learning can improve students' psychomotor skills (Sumarni et al., 2016). The PjBL method in learning has improved students' creative thinking abilities (Anazifa & Djukri, 2017). Learning that is faced with contextual learning needs will motivate students to be creative in finding and creating problem solving techniques (Kuswanto & Refnida, 2020). Learning using the PjBL model provides learning experiences to students both from the learning process inside the classroom and outside the classroom through participation, collaboration, and problem solving.

However, the PjBL model still has various shortcomings, including the time and costs to support project completion must be adequate, requires teachers to be more skilled and increase their professionalism, the facilities and infrastructure needed for learning must be adequate, requires students to study hard, master the knowledge and skills , it is not easy to involve all students working in groups, however the PjBL model has advantages if used correctly, including students being more motivated in learning, collaboration between students increasing, students' skills in utilizing learning resources increasing (Niswara et al., 2019);(Lestari et al., 2016). Through the PJBL model, students will be trained to broaden their insight into the problems they face, get students used to thinking critically, and adapt to more up-to-date principles (Anggraini & Wulandari, 2020). The results of this research have revealed the level of effectiveness of implementing the PjBL model in improving students' ability to design a thesis proposal using the quasi-experimental method, which is only carried out in certain classes that are selected non-randomly so that the accuracy is still contemporary. The implementation of the experiment in this research only involved the independent variable (application of the PjBL model) and the dependent variable (the ability of the thesis proposal designer) so that the results were largely determined by the lecturer's ability to apply it and the students' seriousness in learning, but the other variables that determined these conditions were not conditioned. So, to complement the results of this research, it is recommended that in further research the variables to be involved in the experiment of implementing the PjBL model in improving students' ability to design thesis proposals, such as learning motivation, learning facilities, statistical abilities and so on. The results of this research imply that learning Quantitative Research Methodology by assigning students to create a project in the form of a research proposal will strengthen their conceptual understanding and ability to design research proposals if managed systematically based on the PjBL model.

4. CONCLUSION

The results of the data analysis and discussions that have been carried out conclude that the average increase in students' ability in preparing a thesis proposal who are taught using the PjBL model is higher than those taught using the conventional model. The application of the PjBL model is quite effective in learning Quantitative Research Methods because it is able to improve students' abilities in compiling a thesis proposal, while the conventional model (without the application of the PjBL model) is less effective in learning Quantitative Research Methods because it is only able to improve students' ability in compiling a thesis proposal. The level of comparison of the application of the PjBL model with the conventional

model (without application of the PjBL model) is significant at alpha 5 percent so that the PjBL model is considered effective in learning Quantitative Research Methods to improve students' abilities in preparing thesis proposals.

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