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A Study of the Problem Based Learning Model with the Scaffolding Model as Independent Learning

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ABSTRACT

Purpose of the Study: This study aims to investigate teachers' perceptions of the application of the Problem-Based Learning model and the Scaffolding approach in supporting independent learning at Junior high school 1 Muaro Jambi. Understanding teacher responses is critical to optimizing instructional strategies aligned with the goals of the independent learning.

Methodology: A descriptive quantitative research design was employed. The population consisted of all teachers at Junior high school 1 Muaro Jambi, with a sample of 19 respondents selected through a random sampling technique. Data were collected using validated questionnaires and analyzed using descriptive statistical methods to interpret the level of teacher response to both learning models.

Main Findings: The results show that teachers expressed a positive response, with an average approval rating of 79.8% towards the implementation of both the Problem-Based Learning and Scaffolding models in promoting independent learning. Teachers acknowledged that these models enhanced student engagement, critical thinking skills, and autonomy in the learning process, although some highlighted the need for further training and resource support to maximize implementation.

Novelty/Originality of this Study: This research offers a novelty contribution by providing empirical insights into teacher perceptions of combining PBL and Scaffolding approaches specifically within the framework of independent learning initiatives. Unlike previous studies that often focus solely on student outcomes, this study emphasizes the teacher's role as a mediator in implementing innovative pedagogical models. The findings serve as a foundation for developing targeted professional development programs that empower teachers to foster more autonomous and student-centered classrooms.

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1. INTRODUCTION

Freedom to learn is an educational concept that originates from Indonesia. The concept of independent learning implies independence and independence for educational institutions both in schools and universities [1], [2]. Merdeka Belajar aims to provide more independence and freedom to educational institutions, teachers and students in the learning process [3]–[5]. Therefore, independent learning is an effort to give teachers freedom to use learning models that are more varied and responsive to students' conditions and potential [6], [7]. So choosing a learning model gives teachers the opportunity to accommodate diverse learning styles and individual student needs.

The learning model is an approach or method used in the process of teaching and learning [8]–[10]. It includes different strategies, techniques and approaches designed to facilitate students' understanding and mastery of the subject matter. The learning model is an approach or method used in the process of teaching and learning [11]–[13]. One of the learning models in which students learn through solving real problems is the based learning model [14]–[16].

Problem-Based Learning (PBL) is a learning approach where students are involved in solving real problems as the main foundation of the learning process [17], [18]. PBL begins with the presentation of a problem that not only has a clear and direct answer, but requires in-depth analysis, information retrieval, and critical thinking to reach a good solution [19]. Apart from the based learning model, there is also a scaffolding model. In the context of PBL, the scaffolding model means that the teacher or facilitator provides guidance, support and direction to students to help students achieve better understanding and problem solving [3], [20].

Scaffolding is a cooperative problem-solving effort between teachers and students with the aim that students can complete their tasks as soon as possible independently [21], [22]. Scaffolding in the context of the learning process refers to an approach in which a teacher or facilitator provides gradual support and guidance to students as they develop new understanding and skills [7], [23]. The scaffolding model is designed to assist students in achieving learning objectives in a structured and supportive way.

Several previous studies have examined the effectiveness of both Problem-Based Learning (PBL) and scaffolding models in improving students' critical thinking, problem-solving abilities, and independence in learning [24]–[26]. Research by [27] demonstrated that PBL increases student engagement and enhances their problem-solving skills. Meanwhile, scaffolding has been shown to provide significant benefits in guiding students through complex problem-solving processes, making them more independent learners [28]. However, limited studies have analyzed the combination of these two models in the context of independent learning, especially from the teacher's perspective.

The urgency of this study lies in its attempt to bridge the gap in research regarding teachers' responses to PBL and scaffolding models within independent learning environments. Unlike previous studies that focused solely on student outcomes, this research aims to understand teachers' perspectives, challenges, and effectiveness of both learning models in facilitating independent learning. The novelty of this research is to analyze teacher responses to the problem-based learning model and the scaffolding model, thereby providing a fresh insight into how these models influence teaching strategies and student independence. The insight into problem-solving plans provided by this study will offer practical recommendations for educators on how to integrate PBL and scaffolding effectively to enhance independent learning at Junior high school 1 Muaro Jambi. This study will not only contribute to the theoretical discourse on instructional models but also provide empirical evidence that can be used to refine and improve educational practices.

2. RESEARCH METHOD

This study uses a quantitative approach. Quantitative research aims to identify patterns, relationships, and trends that may exist in the data, as well as to test hypotheses or research questions using statistical methods [24]. The research design used is a survey where survey research involves collecting data from respondents through questionnaires. Survey research is used to collect data on respondents' opinions, preferences, behavior, and demographic characteristics [25].

The population is the entire research object that is used as a data source in research [26]. The population in this study were all teachers at Junior high school 1 Muaro Jambi. The sample in this research was obtained from a purposive sampling technique. Purposive sampling technique (deliberate sampling) is a method in research in which researchers deliberately select samples according to research objectives [27]. In this technique, samples are selected based on certain criteria that are relevant to the research topic. The aim is to ensure that the sample taken represents the most important or relevant characteristics or cases in the research context. So the sample used was 19 teachers.

The data collection technique used in this study was a non-test instrument in the form of a response questionnaire to the problem based learning model with the scaffolding model adapted from [28]. The grid is in Table 1.

Table 1. PBL model questionnaire sheet grid with seaffolding model

No	Indicator	Educator's behavior	No. question
1	Student orientation on the problem	Determining the Zone of Proximal Development (ZPD) or the level of student development based on their cognitive level, Explaining learning objectives, explaining the necessary logistics, and motivating students to be involved in problem solving activities	1,2
2	Organizing students to study	Help students define and organize learning tasks related to the problem.	3,4
3	Guiding individual or group experiences	Encourage students to collect appropriate information, carry out experiments to get explanations and problem solving, direct students with high ZPD to help students with low ZPD.	5,6
4	Develop and present work results	Assist students in planning and preparing appropriate works such as reports, and assist them by giving direction and assistance in sharing assignments with their friends.	7,8
5	Analyze and evaluate the problem solving process	Help students to reflect or evaluate the investigations and processes they use.	9,10

The questionnaire sheet uses a 5 Likert scale including SS (strongly agree), S (agree), N (neutral), TS (disagree), and STS (strongly disagree). The assessment on this questionnaire sheet is categorized in table 2.

Table 2. Category assessment questionnaire sheet

Assessment score	Category
48 – 59	Very good
36–47	Good
24 – 35	Pretty good
12 – 23	Not good
0 – 11	Very not good

The questionnaire was adapted by the researcher, its validity and reliability were assessed to ensure its effectiveness. Validity testing was conducted through expert judgment, where educational experts evaluated the questionnaire items for relevance, clarity, and alignment with the research objectives. In addition, a pilot test was conducted with a small group of teachers to further refine the instrument [28]. Reliability was measured using Cronbach's alpha coefficient, which ensures internal consistency among the questionnaire items. A Cronbach's alpha value above 0.7 indicates that the questionnaire has a high level of reliability, making it a reliable instrument for collecting data on teachers' responses to PBL and scaffolding models in self-paced learning environments.

Data collection was carried out by distributing response questionnaires to each teacher at Junior high school 1 Muara Jambi. Analysis of this research data uses descriptive statistics. Descriptive statistics is a part of statistical analysis that focuses on understanding and describing data in detail [19]. The aim is to provide a general description of the characteristics, patterns and nature of the observed data [29]. Research can be done using a questionnaire sheet instrument. After the data is obtained and collected, data analysis is carried out to obtain results and draw conclusions. The procedure in this study follows the diagram in Figure 1.

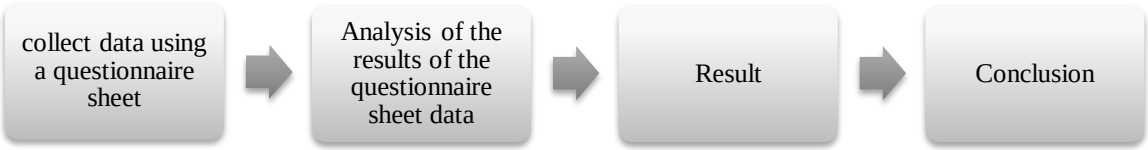

Figure 1. Research procedure

3. RESULTS AND DICUSSION

The results of this research were analyzed using descriptive statistics to determine frequency, percentage, mean, median, mode. The descriptive questionnaire sheet according to the PBL model indicators with the scaffolding model at Junior high school 1 Muara Jambi can be seen in table 3.

Table 3. Descriptive of the PBL model with the seaffolding model at Junior high school 1 Muara Jambi

	Interval	Category	F	%	Mean	Median	Modus	Min	Max
PBL model with scaffolding model	48 – 59	Very good	2	10.6	41.32	41.00	40.00	33.00	50.00
	36 – 47	Good	15	79.8					
	24 – 35	Pretty good	2	10.6					
	12 – 23	Not good	0	0					
	0 – 11	Very not good	0	0					

Based on the descriptive results from Table 3, it is known that the teacher's response to the PBL model with the scaffolding model in independent learning at Junior high school 1 Muara Jambi has a percentage of 79.8% in the good category. The statistical data also indicate an average score of 41.32, a median of 41.00, a mode of 40.00, a minimum value of 33.00, and a maximum value of 50.00.

The problem-based learning model with the scaffolding model both play important roles in education, particularly in influencing teachers' roles and students' learning experiences [30]. PBL encourages students to actively participate in learning, develop problem-solving skills, collaborate, and apply knowledge in real-world contexts [31], [32]. By implementing the PBL model, teachers can ensure that students engage deeply in learning activities [33]. Through this model, students explore solutions, conduct thorough analyses, and enhance their understanding.

Scaffolding, on the other hand, provides structured guidance from teachers to help students tackle complex problems more effectively [34], [35]. This gradual support enables students to progress from basic understanding to more advanced cognitive levels, ultimately fostering independence in learning [36], [37]. Combining PBL with scaffolding has been recommended as an effective strategy to create a dynamic and supportive learning environment [25]. Examined the impact of PBL combined with scaffolding techniques on student independence and learning outcomes. The study found significant differences between students who used these models and those who followed conventional learning approaches [32]. The research highlighted the dominant role of PBL and scaffolding in improving student independence and academic performance.

The key novelty of this study compared to previous research is its focus on analyzing teacher responses to the PBL and scaffolding models. This study fills the research gap by evaluating teachers' perspectives on these instructional strategies, particularly in their role in enhancing the quality of teaching in independent learning environments. By gathering insights from educators, this study complements existing research and provides a more holistic understanding of how these models function in classrooms. However, this study has certain limitations. First, it is limited to a single school, Junior high school 1 Muara Jambi, which may affect the generalizability of the findings. Second, the study relies on self-reported data from teachers, which may introduce biases in responses. Future research should consider expanding the sample size, incorporating multiple schools, and triangulating data with classroom observations and student performance assessments.

4. CONCLUSION

Based on the results obtained, it can be concluded that teachers at Junior high school 1 Muara Jambi responded positively to the implementation of the Problem-Based Learning (PBL) model combined with the scaffolding approach in fostering independent learning, with a positive response rate of 79.8% categorized as "good". This finding indicates that teachers recognize the value of integrating PBL and scaffolding in promoting student autonomy, critical thinking, and problem-solving abilities, which are essential competencies in science learning. The positive response suggests that teachers find this approach effective in balancing guided instruction with independent student exploration, leading to a more engaging and meaningful learning environment. This outcome implies that the PBL with scaffolding model can strengthen students' ability to take ownership of their learning processes while still receiving necessary support. The educational implications of these findings highlight the need for broader implementation of student-centered learning strategies, ongoing professional development for teachers to master scaffolding techniques, and integration of these approaches into the curriculum to systematically foster higher-order thinking skills. Furthermore, schools should create a reflective and supportive teaching culture to maximize the benefits of PBL and scaffolding. Although the findings are promising, the research is limited to a single school context, suggesting the need for further studies in more diverse settings to deepen the understanding of the model's effectiveness. Overall, the positive teacher response underscores that strategic use of PBL and scaffolding has the potential to significantly enhance the quality of science education and support the development of independent, capable learners for the future.

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