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The Influence of Learning Resource Selection and Effective Scenario with Assessment in Problem Based Learning

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KEYWORDS

Learning Resources, Scenario Effectiveness, Problem-Based Learning Assessment.

ABSTRACT

Learning resources are available information and arranged in various forms of media to support the student learning process as an implementation of the curriculum. Problem-based learning (PBL) is an important aspect of the SPICES educational strategy model, which consists of student-centred, problem-based learning, integrated teaching, community-based, elective, and systematic teaching. The application of PBL cannot be separated from the role of scenarios containing patient problems as a trigger for student learning. To know the influence of learning resource selection and the effectiveness of scenarios on assessment in problem-based learning (PBL). This research uses an observational analytical research design with a cross-sectional design using a questionnaire. A comparison test was performed using a non-parametric test method, namely Kruskal-Wallis (bivariate). The results of this research show that the majority of Swadaya Gunung Jati University Medical Education students chose to study using textbooks (52.4%), considered that the scenario given had high effectiveness (57.5%), and had a PBL assessment with a median of 67.0. (0.0-100.0). The results of the analysis also found that there was no influence between the selection of learning resources and the effectiveness of scenarios with the Problem-Based Learning (PBL) assessment (p-value> 0.05). There is no influence between the selection of learning resources and the effectiveness of scenarios with Problem-Based Learning (PBL) assessments for UGJ Medical Education students.

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INTRODUCTION

Learning resources refer to various forms of media, including printed materials, videos, software, or a combination of these, that provide information designed to support the student learning process in alignment with the curriculum (Lau et al., 2018). With the advancement of technology, the availability and variety of these resources have expanded significantly. However, a clear research gap exists in understanding how the selection and integration of these diverse learning resources, alongside the effectiveness of problem-based learning (PBL) scenarios, impact student outcomes. This warrants deeper investigation, as these elements are critical in optimizing the PBL method in medical education.

PBL (problem-based learning) is an important aspect of the SPICES education strategy model, which consists of student-centred, problem-based learning, integrated teaching, community-based, electives, and systematic (Katwa et al., 2018). This method is the main tool for compiling the medical curriculum and is a contributor to the competency-based learning method. The PBL method is an innovative learning method, so it provides a greater challenge by utilizing scenarios from real-world problems to engage and interact by building their previous knowledge, improving their knowledge of

basic concepts, and shaping the knowledge gained separately into learning to then build a complex and well-integrated knowledge structure.

The given scenario acts as the "trigger" for identifying a problem, serving as a stimulus for learning by helping students understand the relevance of underlying scientific knowledge and its practical application in clinical settings (Haukedal et al., 2018). In Problem-Based Learning (PBL), scenarios often feature patient cases or involve physiological, biological, psychological, or social phenomena, all designed to prompt student engagement. However, the effectiveness of PBL also heavily depends on the variety of learning resources, such as textbooks, online media, and clinical simulations, that complement these scenarios. These resources play a critical role in enhancing student engagement and learning outcomes by providing diverse perspectives and in-depth knowledge, thereby supporting the development of clinical reasoning skills (Baloyi & Mtshali, 2018). Studies suggest that the integration of various types of resources can significantly influence how students approach and solve problems within the PBL framework.

High-quality scenarios in PBL can enhance student engagement and comprehension of complex cases, which in turn positively influences academic performance. This is supported by Mewo's (2023) study, which found that well-designed scenarios significantly impact students' academic achievement. Moreover, effective discussions within the PBL framework contribute to a deeper learning process, fostering critical thinking and problem-solving skills. Research on group discussion effectiveness further reinforces this, showing that the quality of group discussions had a measurable impact on students' block exam scores at FKIK UNTAD. These findings suggest that both the selection of learning resources and the quality of scenarios are pivotal to optimizing assessment outcomes, as they align with cognitive learning theories that emphasize active, student-centred learning environments (Kong & Wang, 2024).

Assessments conducted using the PBL method are strongly recommended, alongside a series of assessment approaches aligned with the core principles of student evaluation based on curriculum outcomes (Cifrian et al., 2020). In the context of PBL, the assessment process can be categorized into several key areas: sharing (exchanging opinions or information), argumentation assessment (providing evidence-based arguments from literature), activeness assessment (engagement in discussions), and communication assessment (skills in listening and explaining). By optimizing these assessment methods, especially in resource-limited settings, this research holds the potential to address broader educational challenges and contribute to more effective PBL practices globally.

Based on this background, the purpose of this study is to explore students' learning experiences, specifically examining how the selection of learning resources and the effectiveness of scenarios influence assessment outcomes in Problem-Based Learning (PBL) (Susilawati & Doyan, 2023). This research focuses on first-, second-, and third-year students enrolled in the 2023/2024 academic year at the Faculty of Medicine, Swadaya Gunung Jati University, Cirebon. The practical benefits of this study include providing insights that can guide the design and improvement of PBL curricula and the strategic selection of learning resources in medical education. The findings could have broader implications for educational policy and teacher training, contributing to more effective PBL implementations and potentially shaping the future of medical education.

METHOD

This study employs an observational analytical approach with a cross-sectional design. This design was selected to identify relationships between variables and provide a descriptive overview of a particular phenomenon within the population. The research focuses on the field of medical education

and was conducted at the Faculty of Medicine, Universitas Gunung Jati (UGJ), between April and July 2024.

The target population consists of all Medical Education students at Universitas Gunung Jati, with the accessible population being first-, second-, and third-year students. The sampling process was carefully designed to ensure representativeness, with the sample size determined based on statistical guidelines to reflect the characteristics of the larger population accurately. The Kruskal-Wallis test was chosen as the statistical method due to the non-parametric nature of the data, providing a more suitable approach compared to other methods for analyzing the differences between multiple groups (Corder & Foreman, 2014).

The sample of this study is all first, second, and third-year Medical Education students of Gunung Jati Independent University who meet the inclusion and exclusion criteria. The sampling technique used is simple random sampling, which is sampling with simple randomization, resembling a lottery so that all members of the population have the same opportunity to be selected as research samples.

Data Analysis

Univariate Analysis

This analysis aims to describe the research variables so that it can help the next analysis in more depth (Sovacool et al., 2018). In addition, this descriptive analysis is also used to determine the characteristics of the research subjects who are the research samples. Numerical-scale data (ratios and intervals) will be presented in the form of a table containing the average, standard deviation, median, and data range. Meanwhile, data on a categorical scale (nominal and ordinal) will be presented in the form of frequency and percentage distribution tables.

Bivariate Analysis

This analysis aims to test the research hypothesis and is carried out using a computer program. The free variables in this study have a categorical scale (> 2 groups), while the bound variables in this study have a numerical scale. The numerical data analysis began by identifying the normality of the data distribution using the Kolmogorov-Smirnov test method. The test method used is a non-parametric test method, namely Kruskal-Wallis.

RESULT AND DISCUSSION

Table 1. Characteristics of the Research Subject

It	Variable	Frequency	Percentage
1	**Gender**		
	Woman	135	58%
	Man	98	42%
2	**Force**		
	2021	73	32%
	2022	80	34%
	2023	80	34%
	Total	233	100%

In table 1, it is shown that the frequency distribution of respondents based on female gender is 135 (58%) while male gender there are 98 (42%) respondents, of which most of the respondents are female. In the category of frequency distribution generation, there were 73 respondents (32%) for the 2021 batch, 80 respondents (34%) for the 2022 batch and 80 respondents (34%) for the 2023 batch.

Univariate Analysis

This analysis was carried out to identify the frequency and percentage of variables for selecting learning resources, scenario effectiveness, and assessment of problem based learning (PBL).

Table 2. Frequency Distribution of Learning Resource Selection Variables, Scenario Effectiveness, and PBL Assessment

Characteristic	Frequency	Percentage
Selection of Learning Resources		
Lecture Notes	70	30,0%
Online Media	41	17,6%
Textbook	122	52,4%
Scenario Effectiveness		
Low	3	1,3%
Enough	96	41,2%
Tall	134	57,5%
Total	233	100%
	Median	Min-Max
PBL Assessment	67,0	0,0-100,0

The table above shows that the majority of respondents in this study chose to study using textbooks (52.4%), assessed that the scenarios given had high effectiveness (57.5%), and had a PBL assessment with a median of 67.0 (0.0-100.0).

Bivariate Analysis

Table 3. The Influence Between the Influence of Learning Resource Selection and Scenario Effectiveness on PBL Assessment

		PBL Median *Assessment* (Min-Max)	*p*
Selection of Learning Resources	Lectures Notes	67,0 (0,0-100,0)	0,220
	Online Media	67,0 (0,0-100,0)	
	Textbook	67,0 (0,0-100,0)	
Scenario Effectiveness	Low	83,0 (33,0-83,0)	0,510
	Enough	67,0 (0,0-100,0)	
	Tall	67,0 (0,0-100,0)	

The table above shows that there is no influence between the selection of learning resources and the effectiveness of the scenario with the Problem-Based Learning (PBL) assessment (p-value> 0.05).

Based on the results of this study, it was shown that the majority of Medical Education students of Gunung Jati Independent University chose to study using textbooks (52.4%), assessed that the scenarios given had high effectiveness (57.5%), and had a PBL assessment with a median of 67.0 (0.0-100.0). The results of the analysis also found that there was no influence between the selection of learning resources and the effectiveness of the scenario with the Problem-Based Learning (PBL) assessment (p-value> 0.05).

The results of this study are relatively in line with the research conducted by Suryaningsih et al. (2024) at Gadjah Mada University. The research with the case study design aims to analyze the frequency of acute disease and chronic disease material in learning objectives with tutorial scenarios as well as the consolidation of acute disease and chronic disease content in learning objectives and PBL tutorial scenarios. One of the results of the study found that the match between the PBL tutorial scenario with learning objectives and student outcomes was only 57.78%. This indirectly shows that there is no dominant influence between the quality of the tutorial scenario and the results of PBL.

Different results were shown in the research of Hetharia et al. (2024) at the Faculty of Medicine, Pattimura University. The research, using a qualitative design through focus group discussion, aims to

find out students' perceptions related to PBL activities. One of the results of the study found that one of the factors that affect output and effectiveness and PBL is the quality of the given scenario. This difference in results is suspected to be due to different research methods namely, the research conducted by the researcher is quantitative research, while the research of (Hetharia et al., 2024) is qualitative research.

The selection of learning resources is an important component of the learning process, especially in the context of PBL. Theoretically, the right and relevant learning resources can increase students' understanding of the material being studied. Learning resources such as textbooks, journal articles, and online resources provide information that can help students solve the given clinical scenario. Varied and comprehensive learning resources are expected to provide broader and deeper insights, thus helping students develop analytical and problem-solving skills (Tan, 2021).

This study indicates that the selection of learning resources does not have a significant impact on assessment outcomes in PBL. This finding aligns with several educational theories, which suggest that the quality of resources does not solely determine learning effectiveness but is also influenced by other factors, such as students' intrinsic motivation, peer interaction, and the quality of facilitation (Wei et al., 2023). While quality learning resources provide important information, students' ability to synthesize and apply that information within clinical scenarios plays a critical role. Consequently, success in PBL is likely shaped more by the dynamic interplay of various factors, where learning resources serve as one component among many others. Future research should investigate additional factors such as motivation and facilitator quality to better understand what drives success in PBL environments.

The effectiveness of scenarios in PBL also plays an important role in creating challenging and relevant learning situations for students. Well-designed scenarios can encourage students to think critically, conduct in-depth analyses, and develop innovative solutions to complex clinical problems (Giuffrida et al., 2023). Theoretically, realistic scenarios that are in accordance with the actual clinical context can increase student engagement and motivation, so it is expected to improve their assessment results in PBL.

The results of this study show that there is no significant influence between the effectiveness of the scenario and the results of the assessment in PBL. This may be due to variability in the way students respond to the given scenario. Although effective scenarios can facilitate the learning process, students' success in PBL also depends on their individual ability to apply their knowledge, work collaboratively in a team, and adapt to dynamic situations. In addition, external factors such as support from facilitators and the learning environment also play an important role in influencing learning outcomes (Mathisen et al., 2022).

CONCLUSION

The findings of this study reveal that the majority (52.4%) of UGJ Medical Education students across first, second, and third grades prefer studying with textbooks, and most (57.5%) of students at these levels perceive the scenarios provided as highly effective. The median PBL assessment score for these students was 67.0 (0.0-100.0). However, no significant relationship was found between the choice of learning resources and the effectiveness of scenarios with the students' PBL assessments.

In light of these results, medical educators are encouraged to explore ways to optimize learning resource selection, potentially integrating digital tools or interactive materials that align with student preferences. Furthermore, enhancing scenario design in PBL to better support critical thinking and application of knowledge could improve learning outcomes. Future research should investigate additional factors, such as student motivation, instructional methods, or technological integration, to better understand their influence on the success of PBL in medical education.

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