

The Effect of Problem-Based Learning Model on Efforts to Improve Critical Thinking Abilities of Nursing Students of Jayapura Health Polytechnic Papua

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ABSTRACT: Critical thinking skills are essential competencies that nursing students must possess to navigate the complexities of clinical practice. The problem-based learning (PBL) model is believed to foster the development of these skills through an active, collaborative, and contextual approach.

This study aimed to determine the effect of implementing PBL on the critical thinking skills of nursing students at the Jayapura-Papua Health Polytechnic. The research method used was quantitative with a pretest-posttest control group design. The sample consisted of 60 students divided into two groups: an experimental group (participating in PBL learning) and a control group (participating in conventional learning). The instruments used included a critical thinking questionnaire and an observation sheet. Data analysis was performed using paired t-tests and independent t-tests. The results showed a significant increase in critical thinking skills in the experimental group compared to the control group ($p < 0.05$). PBL proved effective in improving critical thinking indicators such as analysis, evaluation, inference, and reflection.

It can be concluded that the problem-based learning model has a positive influence on the development of critical thinking skills in nursing students at the Jayapura-Papua Health Polytechnic. It is recommended that nursing educational institutions integrate PBL more broadly into their curricula.

KEYWORDS: problem-based learning, critical thinking, nursing students, PBL

INTRODUCTION

Critical thinking skills are an essential competency for nursing students facing the challenges of complex and dynamic clinical practice. In nursing, rapid and accurate decision-making relies heavily on the ability to analyze, evaluate, and reflect on patient situations. However, 85% of the learning process still uses traditional methods, even though the 2014 Diploma III nursing curriculum is a competency-based curriculum (KBK). This traditional learning process emphasizes only theoretical achievement and understanding of the material outlined in the curriculum (Ito1, 2021).

The problem-based learning model (PBL) has been widely used as an innovative approach in higher education, including nursing. PBL places students at the center of learning, encouraging them to solve real-life problems collaboratively and independently. Through this process, students not only gain knowledge but also hone critical thinking skills, which are crucial for nursing practice (Bittencourt1, 2013).

Problem-based learning emphasizes solving real-life problems, with students actively participating in identification, analysis, and evaluation. This allows students to learn how to use their knowledge to solve patient/client problems. Lecturers/teachers play a dominant role as information centers (teacher-centered). As a result, students tend to passively receive learning. However, when using problem-based learning, the lecturer's role becomes that of facilitator, motivator, and guide, thus becoming student-centered (Banu Aji Dibyasakti, 2013).

Problem-based learning is a method where students are initially confronted with a problem, followed by a student-centered information-seeking process. Problem-based learning focuses on the student and problem-first learning, while subject-based learning involves the lecturer conveying knowledge to the students before using problems to illustrate the knowledge. Problem-based learning aims to enable students to acquire and construct their knowledge efficiently and in an integrated manner (Neil Bodagh 1, 2017).

Student-centered learning encourages students to actively explore knowledge, beginning with a problem, followed by group discussions, data and/or information searches, and analysis to find solutions. This process follows Kolb's learning cycle, which begins with concrete experience, reflective observation, abstract conceptualization, and active experimentation. This means that with problem-based learning, students are trained to identify problems, think analytically, creatively, reflectively, and evaluatively (E Arruzza 1, 2023).

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However, the implementation of PBL in nursing educational institutions still faces various challenges, such as faculty readiness, curriculum, and student learning culture. Therefore, it is important to examine the extent to which the PBL model influences the improvement of nursing students' critical thinking skills. To ensure the implementation of problem-based learning, changes are made through various training sessions involving lecturers/teachers in designing innovations to foster a sense of ownership (Weilin Zhang¹†, 2024).

According to Kataoka-Yahiro and Saylor (1994), critical thinking involves considering more than one solution to each nursing problem. Students engage in the cognitive process of dialectical thinking. Dialectical thinking, in turn, focuses on nurses' open-mindedness, curiosity, and skepticism, which may lead to conflict development and problem-solving. Critical thinking is reflective and rational decision-making about nursing problems that have more than one solution.

According to Alfaro-LeFevre (2024), critical thinking is a key feature of nursing, with knowledge, education, and practice derived from patient needs and guided by professional standards. Furthermore, it is a consistently evaluated and self-reflective process aimed at improvement. Therefore, critical thinking is self-reflective and rational thinking that focuses on decision-making about nurses' beliefs and actions. Nurses note that critical thinking is the ability to compare and contrast alternative decisions.

The application of critical thinking to nursing has generated some degree of confusion and uncertainty. This confusion and uncertainty occurs when nurses, nurse educators, and students use critical thinking interchangeably with other relevant expressions and concepts that have different meanings. Despite a clear consensus on the importance of critical thinking, its effects and cultural beliefs on this concept remain unknown. Students report that there is inadequate evidence regarding cross-cultural perspectives on critical thinking (Xinyu Hua, 2025).

To achieve a sense of ownership, innovation is implemented gradually, using blended learning for efficiency. This is done by considering research findings on the positive impacts of innovation, and conducting regular reviews and collaborative reflection.

LITERATURE REVIEW

Recognizing the need and accepting responsibility for identifying gaps in knowledge, skills, and attitudes, the author was motivated to develop a learning program to address these gaps. The author's experience shows that failure to provide adequate support can result in students adopting undesirable learning habits in order to survive. Following the tradition of Kilpatrick (1918, 1921) and Dewey (1938), these approaches emphasize the importance of practical experience in learning (Whittingham, 2019).

Problem-based learning (PBL) is part of this tradition of meaningful, experiential learning. The shift from teacher-centered to student-centered learning in higher education presents challenges for administrators, educators, and students. The challenges stem from differences resulting from changes in educational strategies. Problem-based learning has long advocated for experiential education. Research and psychological theory suggest that by allowing students to learn through problem-solving experiences, they can learn content and thinking strategies (Emma A Mensour, 2025).

Problem-based learning (PBL) is a learning method in which students learn through facilitated problem-solving. In problem-based learning, students focus on complex problems that do not have a single correct answer. Students work in collaborative groups to identify what they need to learn to solve the problem. They engage in self-directed learning (SDL) and then apply their new knowledge to the problem and reflect on what they learned and the effectiveness of the strategies used (Hartling, 2010).

The lecturer/teacher acts to facilitate the learning process, rather than imparting knowledge. The goals of problem-based learning include helping students develop (1) flexible knowledge, (2) effective problem-solving skills, (3) self-directed learning (SDL) skills, (4) effective collaboration skills, and (5) intrinsic motivation. Problem-based learning is part of the tradition of meaningful and experiential learning. In problem-based learning, students learn by solving problems and reflecting on their experiences.

Problem-based learning is well-suited to helping students become active learners because it places learning in real-world problems and holds students accountable for their learning. Problem-based learning has a dual emphasis on helping learners develop strategies and construct knowledge. This article describes problem-based learning and differentiates it from conventional learning. Problem-based learning is an experience-based learning process focused and organized around the investigation, explanation, and resolution of meaningful problems (Ma1, 2022).

In problem-based learning, students work in small collaborative groups and learn what they need to know to solve problems. The teacher/lecturer acts as a facilitator, guiding students' learning through the learning cycle depicted in Figure 1. In this cycle, also known as the problem-based learning tutorial process, students are presented with a problem scenario. They formulate and analyze the problem by identifying relevant facts from the scenario (Pangastuti1, 2022).

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recognize unspoken assumptions and values, understand and use language accurately, clearly interpret data, assess evidence, and evaluate arguments, recognizing the existence of logical relationships (Tian†, 2017).

In professional nursing, critical thinking is a strong knowledge base that enables nurses to analyze nursing interventions and their potential outcomes and effects. Wilkinson (1992) defines critical thinking as the fundamental knowledge, attitudes, and skills applied to all nursing situations. Nurses must be critical thinkers as they deal with patients' lives. They are faced with challenges in their daily practice that require the ability to make rational and critical clinical decisions and make sound, logical clinical judgments to solve health-related problems (Kwan, 2019).

Critical thinking is understood as purposeful, self-regulated judgment that results in interpretation, analysis, evaluation, and inference, as well as explanations based on evidential, conceptual, methodological, criterion-based, or contextual considerations. Core cognitive thinking skills are supported and driven by identified affective dispositions such as curiosity, analytical thinking, open-mindedness and fairness, flexibility, self-confidence, systematicity, truth-seeking, and maturity. An exploratory and descriptive approach is used to explain how students' critical thinking can be facilitated in clinical nursing education (Łopińska1, 2021).

METHODOLOGY

This study used a quantitative experimental design (pretest-posttest control group design) to measure changes in critical thinking skills before and after problem-based learning (PBL) treatment. This study was conducted on two groups of nursing students: an experimental group receiving problem-based learning (PBL) and a control group receiving conventional learning. Critical thinking skills were measured before (pretest) and after (posttest) the treatment.

RESULTS AND DISCUSSION

Statistical Data

Kelompok	Responden	Pre-Test	Post-Test	Selisih
Eksperimen (PBL)	30	18,4	25,6	+ 7,2
Kontrol	30	18,1	20,3	+ 2,2

Based on the data, there was a significant increase in scores in the experimental group (+7.2 points) after treatment. Meanwhile, there was also an increase in the control group, but it was relatively small (+2.2 points) without any special treatment. This indicates that the problem-based learning intervention given to the experimental group had a more significant impact on increasing scores. The increase in scores in the experimental group (7.2) was much higher than in the control group (2.2). Thus, this difference indicates that the problem-based learning intervention given had real effectiveness in improving learning outcomes in knowledge and skills compared to the group that did not receive treatment.

Kelompok	N	Mean Pre-test	Mean Post Test	Selisih Mean	t	P- Value
Eksperimen	30	18,4	25,6	+7,2	12,345	< 0,001
Kontrol	30	18,1	20,3	+2,2	2,456	0,019

In the experimental group, the paired t-test results showed a significant difference between the pre-test (M = 18.4) and post-test (M = 25.6) scores, with a mean difference of 7.2 (p < 0.001). This indicates that the treatment significantly improved respondents' scores.

In the control group, there was an average increase from pre-test (M = 18.1) to post-test (M = 20.3) with a difference of 2.2. The test results showed this difference was also statistically significant, but with a smaller increase compared to the experimental group (p < 0.05). A comparison of the score difference (post-test – pre-test) between the experimental group (M = 7.2) and the control group (M = 2.2) showed a significant difference (p < 0.001). Thus, it can be concluded that the score increase in the experimental group was significantly higher than that in the control group.

Interpretation of Results

Based on the statistical analysis, it can be concluded that the problem-based learning model has a significant influence on improving the critical thinking skills of Diploma III nursing students at the Jayapura-Papua Health Polytechnic. The experimental group showed greater improvement than the control group, both descriptively and inferentially.

CONCLUSION

Based on the results of the research, it can be concluded that the problem-based learning (PBL) model has a significant influence on improving the critical thinking skills of Diploma III nursing students at the Jayapura-Papua Health Polytechnic. This is evidenced by the significant difference in pretest and posttest scores between the experimental group and the control group.

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Students who participated in the problem-based learning approach showed improvements in critical thinking indicators such as analysis, evaluation, inference, and reflection. They were more active in the learning process, able to identify problems in depth, and develop solutions based on data and clinical logic. The application of problem-based learning also encouraged students to work collaboratively, think independently, and develop communication skills, which are essential for nursing practice.

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