Original Research Article

PROBLEM-BASED LEARNING MODEL IN ACHIEVEMENT OF COMPETENCE OF NURSING STUDENTS DURING THE COVID-19 PANDEMIC

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Abstract

Background: A new policy has occurred in the world of education due to the impact of the COVID-19 pandemic, which has changed learning that must come to a class or a building or campus, to become independent learning, including nursing students. In this case, they are still required to have abilities by existing competency standards, including cognitive, affective, and psychomotor abilities that can be achieved by applying case-based learning and project-based learning models.

Objectives: Find out the problem-based learning model in competency achievement of nursing students during the COVID-19 pandemic.

Methods: The research method used is analytic observational with a case-control approach. The variables in this research are teaching methodology as an independent variable and competency achievement as a dependent variable. The research was conducted for 5 months at the Diploma Nursing Study Program, Faculty of Nursing, Universitas Jember. The data collection technique in this study was by using an instrument in the form of Nursing Clinical Exercise (NCEx). The research respondents were Diploma Nursing Study Program Students with a total of 101 treatment groups with the criteria of having passed in 2022.

Results: The research results show that learning models based on Case case-based learning and project-based learning are very important to develop in the classroom, laboratory, and clinical learning where students need real conditions about real cases that require direct identification and recognition. The use of PjBL may lead to improved competency achievement among nursing students. This could be reflected in higher scores on competency assessments, better clinical performance, and a deeper understanding of nursing concepts. Students also really need to be in real contact with nursing cases, especially the conditions of the COVID-19 pandemic which is a challenge for educators and students in the world of health.

Conclusion: The problem-based learning method is very helpful for students in meeting the competency targets for graduates of the third diploma in nursing.

Keywords: *Learning, Competence, Nursing*

INTRODUCTION

Unforeseen circumstances in the form of the coronavirus disease (COVID-19) outbreak have brought urgent changes to various sectors (Maisyaroh et al., 2020). Every day data in the world reports the increase in the scope and impact of COVID-19, Indonesia is also in a state of national emergency. This influences changes and policy updates to be implemented. New policies also occur in the world of education, changing learning that must come from a class or a building, in this case, the campus, to just being at home. (Khasanah et al., 2020) (Nafrin & Hudaidah, 2021). Current conditions are a challenge for the world of nursing education to immediately respond by conducting online learning using e-learning developed by related institutions as well as using learning support resources that are already available in cyberspace (Angga Sugiarto, 2020; Herliandry et al., 2020).

The competency-based curriculum emphasizes the abilities that must be possessed by graduates of a level of education and the abilities that must be achieved are expressed by competency standards, namely the minimum abilities that must be achieved by graduates and competency standards are the main capital to compete at the global level because the competition that occurs is on the ability human Resources (Rahman, 2022). The achievement of clinical competence (skills) of students as an assessment of learning outcomes in a competency learning system is a process of determining whether students are competent or not yet competent. These problems require educational institutions to apply learning methods that can improve student competence including cognitive, affective, and psychomotor abilities (Hikmawati et al., 2018). The focus of learning activities is developing the ability to carry out competencies with certain performance standards so that the results can be enjoyed by students in the form of professionalism according to the expected competencies. Students actively develop the knowledge and skills they learn, and the results are manifested in one them through student learning achievements and student soft skills (Dewi, Ari Pristiana., Sabrian, 2014; Muis Vangino Daeng Pawero, 2018).

The learning method with the Student Center Learning (SCL) approach gets better results and students are more active than those using the Teacher Center Learning (TCL) approach (Hikmawati et al., 2018). There are various learning models with the SCL approach, including Nursing Case Based Learning, Small Group Discussion, Role-Play, Simulation Case Study, Discovery Learning (DL), Cooperative Learning (CL), Collaborative Learning (CbL), and Contextual Instruction (CI), Project Based Learning (PjBL), Problem-Based Learning and Inquiry (PBL), and Self-Directed Learning (SDL). This learning model can be applied individually and in groups. Both face-to-face and through communication media. In the conditions of the COVID-19 pandemic work from home (WFH), Physical Distancing, and study-at-home learning models are implemented with online media (Angga Sugiarto, 2020).

Good teaching methods are the main and fundamental thing in improving student abilities (Fibriansari et al., 2022). One of the learning methods that can be applied in the Competency-Based Curriculum in the world of nursing education is Problem-Based Learning (PBL) and Project Based Learning (PjBL). The Problem-Based Learning Model is a student-centred learning strategy, that develops active learning, problem-solving skills, and field knowledge, and is based on understanding and problem-solving (Ahmar et al., 2020). Project-based learning can empower students to gain new knowledge and understanding based on their experiences through various presentations with the characteristics of students identifying important ideas and asking questions, finding understanding in the identification process, producing products, and thinking creatively, critically, and skilfully in identifying, concluding material, and connecting in real,

authentic worlds and issues (Hikmawati et al., 2018). The problem-based learning model can provide benefits for students in improving therapeutic communication skills, critical thinking, and solving nursing care problems.

Objective(s): to determine the Problem-Based Learning method in student competency achievement, especially nursing students who were also affected by changes in learning methods during the COVID-19 pandemic.

METHODS
Study Design

The research method used is analytic observational with a case-control approach. In this study an analysis of the data was carried out, therefore in analytical research, it is always necessary to formulate a hypothesis before the research begins. The case-control research design is analytical research that concerns how risk factors are studied using a retrospective approach.

Setting

The research was carried out by the D3 Nursing Study Program, Faculty of Nursing, University of Jember from May to September 2022.

Research Subject

The population in this study is the 2019 batch of 101 students.

The inclusion criteria for this study were D3 Nursing Study Program Students, the Faculty of Nursing, and the University of Jember who had graduated in 2022. Meanwhile, the exclusion criteria for this study were respondents who were not willing to fill out the questionnaire that had been given.

Instruments

Assessment of achievement in lectures for each subject is measured using academic scores and clinical practice is measured by 7 indicators according to clinical practice evaluation instruments. The Nursing Clinical Exercise (NCEx) clinical competency assessment includes 7 assessment criteria, namely subjective data focus assessment, physical examination focus assessment, formulation of nursing diagnoses, care planning, action management, and interpersonal communication and relationships.

Measurement of competency achievement in PjBL and CBL learning is measured using a final assessment with a passing score category > 75. Meanwhile, Objective Structured Clinical Examination (OSCE) achievement is measured using an OSCE exam assessment rubric including ethics/legal/culturally sensitive competency, nursing care/nursing care management, and professional development with a borderline group method scoring system.

Validity analysis is done by calculating the content validity index value. Interrater analysis by calculating Cronbach's alpha value. Analysis of achievement of learning competencies and OSCE with frequency distribution.

Data Analysis

Data is presented in a descriptive form and analyzed according to the findings of this study.

Ethical Consideration

The Research Ethics Committee approved this study of the Faculty of Dentistry, University of Jember with No. 157/UN.25.8/KEPK/DL/2022.

RESULTS
Characteristics of Respondents

In this study, the number of respondents was 101 people with the characteristics of the respondents in Table 1. Most of the students are female (72.3%) and are 21 years old (99.1%).

Table 1. Characteristics of Respondents

Characteristics of	F	%
Gender		

Man	28	27,7
Woman	73	72,3
Age		
21st years	91	99,1
22nd years	10	9,9

Achievement in Courses

Based on the formative evaluation that was carried out comprehensively along with a list of competency achievements in CBL and PjBL courses in Table 2. Most students have fulfilled competencies with scores > 75.

Table 2. Achievement in Courses

No	Courses	Method	Category	
			Fulfilled	Not fulfilled
1.	Nursing Ethics	CBL	100	1
2.	Communication	PjBL	101	-
3.	Basic Concepts of Nursing	CBL	101	-
4.	Nursing Methodology	CBL	101	-
5.	Nursing Documentation	PjBL	101	-
6.	Nutrition and diet	CBL	96	5
7.	Basic Nursing	CBL	101	-
8.	Pathophysiology	CBL	93	8
9.	Health Promotion	PjBL	100	1
10.	Maternity Nursing	CBL	100	1
11.	Medical Surgical Nursing I	CBL	90	11
12.	Professional Nursing	CBL	100	1
13.	Patient Safety Management	CBL	101	-
14.	Child Nursing	CBL	101	-
15.	Gerontic Nursing	CBL	95	6
16.	Psychiatric Nursing	CBL	101	-
17.	Medical Surgical Nursing II	CBL	101	-
18.	Gadar Nursing, Critical, & Disaster Management	PjBL	100	1
19.	Family Nursing	PjBL	101	-
20.	Public Health Nursing	PjBL	101	-
21.	Complementary Nursing	PjBL	101	-
22.	Occupational Health and Safety	CBL	101	-
23.	Research Methodology	PjBL	101	-
24.	Agronursing	PjBL	101	-
25.	Nursing Management	CBL	101	-
26.	Personality and Career Development	CBL	101	-
27.	Information Technology in Nursing	PjBL	101	-
28.	Scientific papers	PjBL	101	-

Based on Table 2, Achievement in Courses for 28 courses is 35.7% using the PjBL method. Several students did not fulfill the competence in lectures in theory and practicum, namely nutrition and diet (5 students), pathophysiology (8 students), medical surgical nursing I (11 students), and gerontic nursing (6 students).

Clinical Practice Competency

Clinical practice competency is assessed using the online Nursing Clinical Exercise (NCEx) instrument through Google Forms. Student clinical competency assessment includes 7 assessment criteria according to Table 3.

Table 3. Clinical Competency Assessment Instrument (Nursing Clinical Exercise (NCEx)

No	Criteria	Above Expectations (2)	As Expected (1)	Not As Expected (0)
1	Subjective data focus assessment	14	87	-
2	Assessment of the focus of physical examination	14	87	-
3	Formulation of nursing diagnoses	17	83	1
4	Treatment planning	15	85	1
5	Action management, time efficiency, equipment, and being able to identify self-deficiencies	12	89	-
6	Communication and interpersonal relationships	16	84	1
7	Professionalism Application of professional values	15	85	1

The attainment of clinical competence (skills) of students as an assessment of learning outcomes in a competency learning system is a process of determining students. Table 3 shows that for clinical competency assessment based on clinical supervisors, students are already in the category above expectations and as expected. The average achievement of the Clinical Competency Assessment is 84.1% in the expert category and 14% in the above expectations category.

OSCE Competency

The implementation of the Objective Structured Clinical Examination (OSCE) on 11-14 July 2022 at the OSCE Laboratory of the Faculty of Nursing, University of Jember, as many as 88 students stated that the graduation rate was 97.5% consisting of Superior 10 people (11%), Graduated 69 people (78%) Borderline 7 people (8%)), did not pass 2 people (2%).
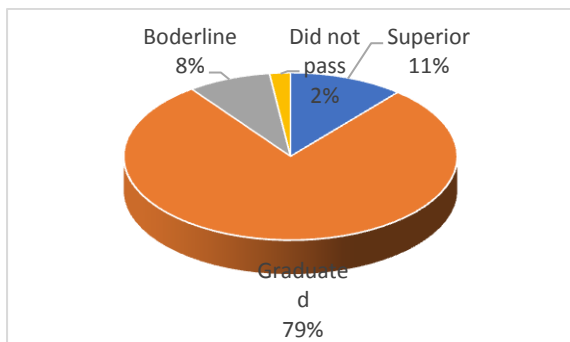

Figure 1. Percentage of OSCE results

National Competency Test Competency

Following SK No. 0988/KOM-Kes/IX/2022 September 6, 2022, by the National Committee for Competency Testing of Students in the Health Sector UKOMNas graduation for the August period was 97.5% (80 participants). The distribution of graduation data is in Figure 2.
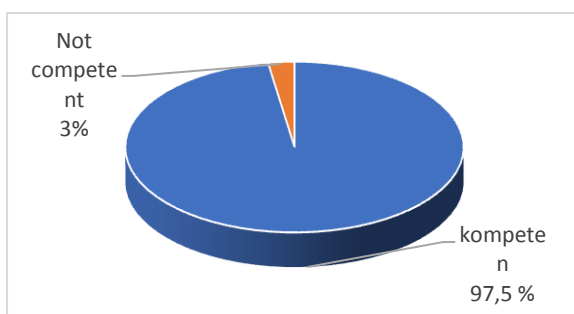

Figure 2. Percentage of UKOMNas results

Figure 2 shows that the CBL and PJBL methods have a positive impact on achieving competency in lectures as indicated by the percentage of students who pass the National Competency Examination, most of whom are declared competent, namely 97.5%.

DISCUSSION

Good teaching methods are the main and fundamental thing in improving student abilities (Ahmar et al., 2020). One of the learning methods that can be applied to the Competency-Based Curriculum (CBC) in the world of nursing education is Problem-Based Learning (PBL) and Project Based Learning (PjBL) (Barisone et al., 2019). In PBL, the lecturer acts more as a facilitator than a teacher (Seibert, 2021). Facilitators help groups build understanding and relate concepts to information, direct exploration, reinforce understanding of difficult concepts, and introduce resources. In addition, the facilitator encourages reflection on group processes and group results. Facilitators can also be considered as trainers or guides who provide feedback and encouragement in learning.

To evaluate the achievement of student competencies, one of them is with an exam using the OSCE method which has advantages in assessing clinical performance and professional behaviour. For the implementation of a quality OSCE, various preparations are carried out such as the identification of Clinical Core Competency, and competency determination (Elindra et al., 2019; Kurniasih, 2014). The OSCE Method Examination is a tool for assessing clinical competency components such as medical history assessment and physical examination, procedural skills, communication skills, and professional behaviour which are tested using a Rubik's for objectivity assessment, direct observation of each student so that it can be assessed in a structured/planned manner.

Students who learn based on problems show learning performance, attitudes, motivation, and tendencies to think critically better than those who receive learning (Chang et al., 2020). Determination of the main clinical competency components to be tested is adjusted to the learning outcomes of the educational program (Diploma Nursing and Nurses), including review of medical history, physical examination, procedural skills, counselling, and professional attitudes.

Clinical competence must represent every context of nursing services in the health-illness range which includes promotive to rehabilitative health efforts in all life cycles and the main settings of nursing services.

If a nursing student is unable to achieve a pass with NCEx, this can be due to several factors including not having sufficient knowledge, skills, or experience in clinical practice. Ethics and behaviour in nursing practice are also very important. If a student violates a professional code of ethics or commits an unethical act, this may be a reason for not achieving graduation. Apart from that, difficulties in communicating or collaborating can hinder students' abilities. The first step usually taken is to provide additional support, such as tutors or advice from teachers and supervisors. If the problem is serious or insurmountable, the student may need to repeat the clinic or attend a recovery or additional learning program before being able to attempt the NCEx again. It is important to understand that nursing education programs aim to ensure that all graduates have adequate competency to care for patients safely and effectively.

The problem-based learning model is a student-centered learning strategy, developing active learning, problem-solving skills, and field knowledge, and is based on understanding and problem-solving (Wahyuningsih & Santoso, 2013). Whereas project-based learning can empower students to gain new knowledge and understanding based on their experiences through various presentations with the characteristics of students identifying important ideas and asking questions, finding understanding in the identification process, producing products, and thinking creatively, critically, and skilfully in identifying, concluding material, and connecting in real, authentic worlds and issues (Hikmawati et al., 2018; Rati et al., 2017). This is very necessary for learning during the Covid-19 pandemic because most of the learning is done online so students are required to study independently. However, on the other hand, the competencies that must be possessed by students are still by the national standards of Indonesian Higher Nursing Education.

Problem-based learning is one method that can be used to encourage active learning based on the concept of social constructivism (Zakaria et al., 2019). Project-based learning or case studies have a positive impact on nursing students in developing affective and psychomotor academic competence. While PBL is not a new teaching strategy, it is an ideal, evidence-based, option for filling the skills gap regarding students' critical thinking and persistence. The use of problem-based learning is growing rapidly in nursing and teaching clinical skills to nursing students universally.

However, implementing PBL can take more time than conventional teaching methods. This can be a challenge if there is a lot of material to cover in a limited time. Evaluation should focus more on the learning process than on the result. The success of PBL relies heavily on the active participation of all students in the group. This will make some students feel confused or uncomfortable. So, it is necessary to determine the type of course, learning objectives, and student needs before implementing this learning method.

Limitations study is not confined to sample representativeness and/or sample size and generalizability/external validity of the results.

CONCLUSION

The use of learning methods in the form of Case Base Learning and Project Base Learning for student competence achievements during the Covid 19 Pandemic was very effective in teaching. This is evidenced by the achievement of learning outcomes in the form of grades, OSCE exam results, and national competency exam results, most of the students have fulfilled the competencies. This learning method should always be implemented and become a choice in the learning process, especially learning

outcomes that emphasize affective and psychomotor aspects.

SUGGESTIONS

The results of this research can be used as a basis for recommending effective learning methods during emergencies such as pandemics and guide educators and educational policies in facing similar challenges in the future. Nursing diploma higher education institutions need to immediately implement OBE (Outcome-Based Education) learning and student exchanges to enhance student learning experiences independently and in real terms.

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DECLARATION OF CONFLICTING INTEREST

The authors declared no conflict of interest.

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AUTHOR CONTRIBUTION

Zainal Abidin: Assisting in the interpretation of research results, directing deeper discussions related to research results.

Rizeki Dwi Fibriansari: Collecting data, analyzing data, compiling research results, conducting discussions, directing the preparation of manuscript.

Anggia Astuti: Assisting in the interpretation, of research results, directing deeper discussions related to research results, directing the preparation of manuscripts.

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REFERENCES

Ahmar, H., Budi, P., Ahmad, M., Mushawwir, A., & Khaidir, Z. (2020). Penerapan Model Pembelajaran Problem Based Learning : Literature Review. *Jurnal Keperawatan Muhammadiyah*, *4*(3), 10–17.

Angga Sugiarto. (2020). Dampak Positif Pembelajaran Online Dalam Sistem Pendidikan Keperawatan Pasca Pandemi Covid 19. *Jurnal Perawat Indonesia*, *4*(3), 432–436.

Barisone, M., Bagnasco, A., Aleo, G., Catania, G., Bona, M., Scaglia, S. G., Zanini, M., Timmins, F., & Sasso, L. (2019). The effectiveness of web-based learning in supporting the development of nursing students' practical skills during clinical placements: A qualitative study. *Nurse Education in Practice*, *37*, 56–61.

Chang, C.-Y., Kao, C.-H., Hwang, G.-J., & Lin, F.-H. (2020). From experiencing to critical thinking: A contextual game-based learning approach to improving nursing students' performance in electrocardiogram training. *Educational Technology Research and Development*, *68*(3), 1225–1245.

Dewi, Ari Pristiana., Sabrian, F. (2014). Implementasi Metode Problem Based Learning pada Kurikulum Berbasis Kompetensi dengan Kemampuan Softskill Mahasiswa Prodi Ilmu Keperawatan Universitas Riau. *Jurnal INJEC*, *Vol 1*, *No*, 97–102.

Elindra, M. Z. R., Oktaria, D., & Aries, R. (2019). Hubungan Tingkat Kecemasan terhadap Hasil Ujian OSCE pada

Mahasiswa Tingkat Pertama di Fakultas Kedokteran Universitas Lampung. *Medula*, *9*(1), 123–127.

Fibriansari, R. D., Astuti, A., Maisyaroh, A., & Widianto, E. P. (2022). Persepsi Aplikasi Standart Nursing Language Dalam Dokumentasi Asuhan Keperawatan. *Jurnal Penelitian Sains Dan Teknologi Indonesia*, *1*(1), 42–47.

Herliandry, L. D., Nurhasanah, N., Suban, M. E., & Kuswanto, H. (2020). Pembelajaran Pada Masa Pandemi Covid-19. *JTP - Jurnal Teknologi Pendidikan*, *22*(1), 65–70. https://doi.org/10.21009/jtp.v22i1.15286

Hikmawati, A. N., Huriah, T., & Khoiriyati, A. (2018). PENGARUH PENERAPAN PROJECT BASED LEARNING (PjBL) TERHADAP PENINGKATAN KEMAMPUAN KOGNITIF, AFEKTIF DAN PSIKOMOTOR MAHASISWA. *Jurnal Kesehatan "Samodra Ilmu," 9*(1), 62.

Khasanah, D. R. A. U., Pramudibyanto, H., & Widuroyekti, B. (2020). Pendidikan Dalam Masa Pandemi Covid-19. *Jurnal Sinestesia*, *10*(1), 41–48.

Kurniasih, I. (2014). Lima Komponen Penting dalam Perencanaan OSCE. *Idj*, *3*(1), 42–51.

MAISYAROH, A., FIBRIANSARI, R. D., & WIDIANTO, E. P. (2020). *Buku Pedoman Perawatdalam merawat pasien COVID-19 di ruang Isolasi*. KHD Production.

Muis Vangino Daeng Pawero, A. (2018). Analisis Kritis Kebijakan Kurikulum Antara KBK, KTSP, dan K-13. *Jurnal Ilmiah Iqra*, *12*, 1693–5705.

Nafrin, I. A., & Hudaidah, H. (2021). Perkembangan Pendidikan Indonesia di Masa Pandemi Covid-19. *Edukatif : Jurnal Ilmu Pendidikan*, *3*(2), 456–462. https://doi.org/10.31004/edukatif.v3i2.324

Rahman, A. (2022). Upaya Peningkatan Standar Kompetensi Lulusan. *Adiba: Journal of Education*, *2*(1), 122–132.

Rati, N. W., Kusmaryatni, N., & Rediani, N. (2017). Model Pembelajaran Berbasis Proyek, Kreativitas Dan Hasil Belajar Mahasiswa. *Jurnal Pendidikan Indonesia*, *6*(2), 60–71.

Seibert, S. A. (2021). Problem-based learning: A strategy to foster generation Z's critical thinking and perseverance. *Teaching and Learning in Nursing*, *16*(1), 85–88.

Wahyuningsih, I. S., & Santoso, A. (2013). Pengalaman Mahasiswa S1 Keperawatan Dalam Metode. *Prosiding Konferensi Nasional PPNI Jawa Tengah*, 95–100.

Zakaria, M. I., Maat, S. M., & Khalid, F. (2019). A systematic review of problem based learning in education. *Creative Education*, *10*(12), 2671.