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Blended Learning to Improve the Physical Examination Ability of Nursing Students

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ABSTRACT

Coronavirus disease has an impact on the education sector. Educators use a combined learning method between face-to-face and online learning to break the chain of virus spread. One of the proper methods is blended learning with the help of information and communication technology to achieve learning objectives. This study aimed to determine the effectiveness of the blended learning method on the physical examination abilities of nursing students. This study uses a pre-experiment. The research location is in STIKes (College of Health Sciences), Cirebon, Indonesia, with a sample of 100 Nursing students. The technique uses purposive sampling and the N-Gain value analysis. The result shows a significant difference in the competence of the physical examination before and after getting the blended learning method. The blended learning method is proven effective in increasing the competence of the physical examination of nursing students. In addition, an exciting learning process through online and conventional media provides a high satisfaction value. Blended learning is one of the learning solutions in the new era of the COVID-19 pandemic to suppress the spread of COVID-19 and improve students' abilities.

Keywords: Blended Learning, Teaching, Learning, Physical Examination, Students' Abilities

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1. INTRODUCTION

Education is one of the efforts so that someone can develop their potential through a learning process (Hidayat & Perdana, 2019). Education aims for students to actively develop their potential to have religious and spiritual strength, self-knowledge, personality, intelligence, noble character, and skills needed by themselves, society, nation, and state. Education and health have an essential role in building human intellectual resources. Developed countries are countries that have citizens who have high intellect. All countries are affected by the coronavirus (Del Vecchio Blanco et al., 2020; Herlinawati et al., 2022; Kosim, 2022). Therefore, during the pandemic, education is essential for the prevention of COVID-19 (Ng & Or, 2020; Zhong et al., 2020).

Lesson planning needs special attention (Norwich et al., 2021). Even in a pandemic, students still learn health information by combining face-to-face and distance learning (Singh et al., 2021). In this pandemic condition, it is necessary to apply the proper learning methods to meet the needs of students (Huriyah & Hidayat, 2022; Owolabi, 2020). Related to the role of education as a learning agent, an educator must provide optimal learning. Using various methods and learning models tailored to students' needs and characteristics (Coussement et al., 2020; Mousavinasab et al., 2021; Rasmitadila et al., 2021).

Utilizing this pandemic, students learn using conventional and online methods to help learn about nursing. In online learning, blended learning uses the internet as a learning medium (Sefriani et al., 2021). The internet can be an open source of information for every student (Engelen & Budke, 2022; Kleftodimos

& Evangelidis, 2016). However, the openness and ease of internet access do not make the internet always a good source of learning. Various software can be used in online-based learning, such as Google Classroom, Moodle, Zoom, Edmodo, WhatsApp, and others (Agusriadi et al., 2021; DS et al., 2022). Each software has advantages and disadvantages when compared to one another. The learning model is one of the important components that affect the effectiveness and efficiency of the learning process (Kintu et al., 2017). The learning model used by an educator must be able to meet the demands of various aspects so that learning objectives can be met (MacDonald et al., 2001). The learning model must encourage students to be active in the teaching and learning process to realize student-centre learning (Khalaf, 2018). This means that the education system, from the conventional to the digital era, learning environment involves technology and provides innovation through a blended learning system.

1.1. Blended Learning

A learning strategy known as blended learning combines traditional face-to-face instruction with online remote learning (Mujib & Marhamah, 2020; Widjaja & Aslan, 2022). This learning model combines two learning methods to make learning flexible and better for material mastery and technological progress. Five keys to implementing blended learning. According to Ikhwan & Widodo, (2019):

Live event

Live Events are synchronous direct or face-to-face learning at the same time and location or the same time but in a different location. The primary pattern lecturers still frequently employ in their instruction is direct learning. This instructional strategy must be created to meet the needs of the students while also achieving the learning objectives.

Self-paced learning

Online self-paced learning enables students to study whenever and wherever they want. Both text and multimedia components of lesson plans, such as animation, video, simulation, audio, and images, must be explicitly made. In addition, self-learning can be packaged as a mobile app, web content, book, and streaming audio or video content.

Collaboration

Collaboration is a combination of lecturers and students. Communication technologies like chat rooms, websites, emails, Etc., can be used to create this collaboration. Through social engagement with other individuals, this partnership is anticipated to enhance the development of knowledge and abilities.

Assessment

An integral part of the implementation of the learning process is assessment. The assessment determines the degree of competency mastery that students have attained. Additionally, the assessment serves as a follow-up to the lecturer regarding applying what was learned. As learning designers, the lecturers must be able to combine several offline and online assessment modalities, including both tests and non-tests.

Performance Support Materials

One of the critical elements in assisting the learning process is the teaching materials. The usage of instructional resources will help students learn the content more effectively. To support participants' offline and online access, blended learning content should be packaged in digital and paper formats. Online learning applications should be supported by the usage of educational resources that are bundled online.

The five points mentioned above are closely related and significantly impact blended learning activities. The learning objectives are anticipated to carry out the learning created with the blended learning model using these five points to ensure that it occurs effectively and efficiently.

Blended learning methods take a student-centered approach to learning and vary by discipline, academic level, student characteristics, and learning outcomes (Herayanti et al., 2020; Prafitasari et al., 2021). Blended learning can improve learners' accessibility and flexibility, raise their levels of active learning, and enhance their learning achievements (Bouilheres et al., 2020). For the teacher, blended learning can improve teaching practice and classroom management (Anthony et al., 2019). Blended in question can be in the form of the following: 1. Face-to-face and online learning activities. 2. Conventional face-to-face classes with different models include weekend, intensive, external, and trimester. 3. technology such as lecture capture and or social media and technology. 4. Simulations, group activities, web-based learning, practical.

Student and institutional factors are very influential in the success of blended learning (Previtali & Scarozza, 2019). From the student's perspective, blended learning can be successful if the teacher has sufficient knowledge of using the introduced technology. Students must be trained to explore the data and information provided by blended learning. From an institutional perspective, the allocation of services offered to support and assist students and facilitators during the development and implementation of the module is the institutional component necessary for successful blended learning. In order to get instructors and potential end users involved and fully aware of the value of blended learning, it is necessary to invest resources in communication.

1.2. Physical Examination

The physical examination is a head-to-toe review of each body system that provides objective information about the client and allows us, as nurses, to make clinical judgments (Benbassat & Gilon, 2020; Huber & Epp, 2022; Hummell & Cummings, 2022). In general, the physical examination aims to (Jarvis, 2018): 1. To collect and obtain primary data about the client's health. 2. To add, confirm or refute the data obtained in the nursing history. 3. To confirm and identify nursing diagnoses 4. To make clinical judgments about changes in the client's health system and management. 5. To evaluate the physiological outcomes of nursing care.

Physical examination benefits nurses and other health professions, including 1. As data to assist nurses in determining nursing diagnoses (Tan et al., 2021). 2. Knowing the health problems experienced by clients (Car et al., 2020). 3. As a basis for selecting appropriate nursing interventions (Ackley et al., 2019). 4. As data to evaluate the results of nursing care (Jarvis, 2018).

There are four primary physical examination techniques that we use, namely: inspection (check vision), palpation (check touch), percussion (check knock), and auscultation (check to hear) (Narula et al., 2018). 1) Inspection is examining patients by looking directly at the patient's entire body or only certain needed parts. This method seeks to see the client's condition using a "sense of sign" through the naked eye or lighting aids (lamps). Inspection is an active activity, a process by which the nurse must know what she saw and where it is located. This inspection method assesses the skin colour, shape, position, size, and others of the patient's body. 2) Palpation is a method of examining patients using a "sense of touch." Palpation is an examination carried out by palpation and emphasis on body parts using fingers or hands. The hand and fingers are sensitive instruments used to collect data; for example, this palpation method can detect body temperature (temperature), vibration, movement, shape, consistency, and size. 3) Percussion is an inspection action by hitting/tapping to listen to the sound of vibrations/waves transmitted to the body's surface from the part of the body being examined. The examination involves tapping the finger or hand on the body surface. The journey of vibration / sound waves depends on the density of the medium through which it travels. The degree of sound is called resonance. The character of the sound produced can determine the location, size, shape, and density of structures under the skin. The nature of sound waves is that the more tissue, the weaker the conductivity and the most resonant air/gas. 4) Auscultation is a physical examination performed by listening to the sound produced by the body. Usually, using an instrument called a stethoscope. The things heard are heart sounds, breath sounds, and bowel sounds. Assessment of auscultation examination includes a) Frequency, namely counting the number of vibrations per minute. b) Duration is the length of time the sound is heard. c) Sound intensity is a measure of the strength/weakness of the sound. d) Quality, namely the colour tone/variation of the sound.

2. METHOD

This study uses a pre-experiment. There is no comparison group (control group) through a one-group pre-test and post-test design approach (Agustin, 2022; R Nur Abdurakhman et al., 2022). In this study, a blended learning intervention was given to one group to see whether or not there were changes related to the problem of physical examination abilities before and after treatment. Data collection is only done before giving the action and after giving the action. The research location is in STIKes (College of Health SciencesCirebon, Indonesia, with a sample of 100 DIII Nursing students. The sampling technique uses a purposive sampling technique and the N-Gain value analysis (Kuswanda et al., 2020) of the effectiveness of blended learning to improve physical examination ability.

3. RESULTS AND DISCUSSION

3.1. Results

Physical examination ability

Table 1. Physical Examination Ability using Blended Learning

Categories	Percentage	
	Before	After
Competent (Test score ≥ 80)	16	100
Not yet competent (Test score < 80)	84	0

Table 1 shows that 84% of nursing students cannot perform a physical examination. After intervening using the blended learning method, it decreased to 0%. Table 1 shows that 16% of students can perform a physical examination. After intervention using the blended learning method increased to 100%.

Student satisfaction

Tabel 2. Student Satisfaction

Categories	Percentage
Very satisfied	75
Satisfied	16
Quite satisfied	9
Less satisfied	0
Very dissatisfied	0

Table 2 shows nursing students' satisfaction with using blended learning methods in physical examinations. 75% of nursing students stated that they were very satisfied. 16% of nursing students stated that they were satisfied. 9% of students stated that they were quite satisfied.

N-Gain analysis

Tabel 3. The Effectiveness of Blended Learning on Physical Examination Ability

No. Student	Test scores		N-Gain Score	N-Gain %	No. Student	Test scores		N-Gain Score	N-Gain %
	Pre-test	Post-test				Pre-test	Post-test		
1	65	100	1.00	100.00	51	87	100	1.00	100.00
2	70	100	1.00	100.00	52	65	100	1.00	100.00
3	65	100	1.00	100.00	53	61	87	0.67	66.67
4	70	100	1.00	100.00	54	83	100	1.00	100.00
5	70	100	1.00	100.00	55	70	100	1.00	100.00
6	70	100	1.00	100.00	56	65	100	1.00	100.00
7	83	100	1.00	100.00	57	88	100	1.00	100.00
8	87	100	1.00	100.00	58	65	100	1.00	100.00
9	65	91	0.74	74.29	59	52	91	0.81	81.25
10	78	100	1.00	100.00	60	70	100	1.00	100.00
11	70	100	1.00	100.00	61	87	100	1.00	100.00
12	70	100	1.00	100.00	62	70	87	0.57	56.67
13	70	100	1.00	100.00	63	70	91	0.70	70.00
14	74	96	0.85	84.62	64	83	100	1.00	100.00
15	70	100	1.00	100.00	65	89	100	1.00	100.00
16	70	96	0.87	86.67	66	70	100	1.00	100.00
17	83	96	0.76	76.47	67	61	100	1.00	100.00
18	70	100	1.00	100.00	68	65	100	1.00	100.00
19	65	100	1.00	100.00	69	70	100	1.00	100.00
20	65	100	1.00	100.00	70	65	100	1.00	100.00
21	70	100	1.00	100.00	71	70	100	1.00	100.00
22	70	83	0.43	43.33	72	65	100	1.00	100.00
23	65	100	1.00	100.00	73	65	100	1.00	100.00
24	74	100	1.00	100.00	74	61	87	0,67	66.67
25	96	100	1.00	100.00	75	60	100	1.00	100.00
26	65	100	1.00	100.00	76	70	100	1.00	100.00
27	70	100	1.00	100.00	77	65	100	1.00	100.00
28	83	91	0.47	47.06	78	60	100	1.00	100.00
29	70	96	0.87	86.67	79	65	100	1.00	100.00
30	91	100	1.00	100.00	80	52	91	0.81	81.25
31	70	100	1.00	100.00	81	70	100	1.00	100.00
32	70	100	1.00	100.00	82	65	100	1.00	100.00
33	91	100	1.00	100.00	83	70	87	0.57	56.67

34	91	100	1.00	100.00	84	70	91	0.70	70.00
35	65	100	1.00	100.00	85	65	100	1.00	100.00
36	87	100	1.00	100.00	86	65	100	1.00	100.00
37	70	100	1.00	100.00	87	70	100	1.00	100.00
38	70	91	0.70	70.00	88	65	100	1.00	100.00
39	70	100	1.00	100.00	89	65	100	1.00	100.00
40	65	100	1.00	100.00	90	61	87	0.67	66.67
41	70	100	1.00	100.00	91	60	100	1.00	100.00
42	70	83	0.43	43.33	92	65	100	1.00	100.00
43	70	100	1.00	100.00	93	70	100	1.00	100.00
44	61	100	1.00	100.00	94	65	100	1.00	100.00
45	83	100	1.00	100.00	95	70	100	1.00	100.00
46	61	100	1.00	100.00	96	70	100	1.00	100.00
47	65	100	1.00	100.00	97	70	100	1.00	100.00
48	70	100	1.00	100.00	98	70	91	0.70	70.00
49	65	100	1.00	100.00	99	70	87	0.57	56.67
50	70	100	1.00	100.00	100	70	100	1.00	100.00
		Total				7033	9800	93.56	9354.96
		Average				70.33	98.00	0.9356	93.5496
		Information				Medium	Very high	Effective	Effective

Table 3. Shows the bivariate analysis results, namely before using the blended learning method, the average student's physical examination ability was 70.33, and after that, it was 98.00. With details, the highest score is 100, and the lowest score is 52.

The effectiveness of the blended learning method in physical examination learning can be known through the N-Gain value. According to Hidayat & Perdana (2021), it is not effective if the N-Gain percentage is < 40, less effective if the N-Gain percentage = 40-55, quite effective if the N-Gain percentage = 56-75, and effective if the N-Gain percentage is > 76 (Wahab et al., 2021).

Table 3. shows the average percentage of N-Gain = 93.5496. That is, the blended learning method effectively improves the physical examination ability of nursing students.

3.2. Discussion

Student satisfaction

In blended learning, it is possible for learning interactions to occur from anywhere and anytime (time and place flexibility) (Jalinus, 2021). Students can interact with learning resources that have been packaged electronically. Students can access the internet at any time and from any location (Karma et al., 2021; Le et al., 2022). Likewise, the tasks of learning activities can be handed over to the teacher as soon as they are completed, and students are not tightly bound by the time and place of learning activities, as is the case in conventional education.

This study showed that 75 students were very satisfied with the blended learning method in physical examination learning. 16 students were satisfied with the blended learning method in physical examination learning. 9 students were quite satisfied with the blended learning method in physical examination learning. That shows that most students are very satisfied with the blended learning method. This satisfaction is supported by implementing an exciting learning process because it passes through online and conventional media (Mathivanan et al., 2021). Lecturers need to prepare a learning process with an attractive online and face-to-face learning system to make it easier for students to understand the material being taught (Rasmitadila et al., 2020). In addition, lecturers need to master information technology so that the learning process runs smoothly (Monk et al., 2020).

The effectiveness of the blended learning

The use of information technology in the blended learning model has positively influenced and improved student understanding and learning outcomes (Sefriani et al., 2021; Zheng et al., 2022) but also increased learning motivation, encouraged cooperative and independent learning, and supported the development of student problem-solving and critical thinking skills (Yustina et al., 2020).

The results of the study are supported by research by Laili and Tanoto (2020), entitled "Blend Learning Strategies for Concepts and Physical Examination Procedures for Nursing Students". This study states that blended learning effectively improves student outcomes in understanding concepts (cognitive) and procedures (skills/psychomotor).

The study results were supported by Pancaningsih's (2021) research on "The Blended Learning Training Model Improving Nurses' Learning Outcomes About Basic Operating Rooms". The results showed a relatively practical effect of the blended learning training method in improving nurses' learning outcomes about the basic operating room. The advantages of blended learning are cost and time efficiency and more optimal learning outcomes.

4. CONCLUSION

There is a significant difference in the competence of the physical examination before and after getting the blended learning method. That shows the blended learning method is proven effective in increasing the competence of the physical examination of nursing students. In addition, an exciting learning process through online and conventional media provides a high satisfaction value. Blended Learning is one of the solutions for learning in the new era of the covid-19 pandemic. This method has a role in suppressing the spread of COVID-19 and improving students' abilities during the COVID-19 transition to a COVID-19-free period.

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