The Application of Flipped Learning Model to Cognitive Learning Outcomes and Laboratory Practical Skills

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ABSTRACT

The world of education has developed very rapidly, so that new methods are needed to support the effectiveness of learning process in the classroom, such as ideas related to new educational models and unique ways to continue to communicate with students, inform, collaborate and assess the learning process so that learning becomes fun, without reducing the essence of education. The aim of the research was to determine the effect of implementing the flipped learning model on the cognitive learning outcomes and laboratory practical skills of nursing students at Sahid University, Surakarta. This research used a quasi-experimental design with a pre-post non-equivalent control group design, the research sample was taken using a purposive sampling technique. The sample in this research was student of class A as a class using the Flipped Classroom model and student of class B as a class using a conventional model with a total of 74 students. The results of this research showed that the Paired Sample T-Test test results were $p < 0.05$ which indicated that there was an influence from the application of the Flipped Classroom and conventional models on student cognitive learning outcomes and the average learning outcomes with the application of the Flipped Classroom were higher than those with the application of the conventional model. The conclusion of this research is that it is necessary to apply the flipped learning model because it can improve student learning outcomes in creative thinking.

KEYWORDS

Flipped Classroom, Students, Nursing, Cognitive, Laborator Skills

1. INTRODUCTION

A quality learning process can occur when the lecturer makes a good, relevant and innovative learning plan so that it has an impact on the quality of effective learning outcomes(Du et al., 2022).The rapid development of technology has influenced learning models from traditional ones to more innovative digital-based learning models such as learning methods with flipped learning models(Collins & Halverson 2018). flipped learning model is a learning model that combines learning in the classroom with learning outside the classroom with the aim of maximizing learning activities using video learning media (Alamri, 2019)

According to Alamri (2019). flipped learning models can increase students' learning motivation by 66%. This learning motivation is able to increase students' cognitive learning outcomes by 46.7%. Students are encouraged to study independently through learning videos before attend the class. Students are encouraged to study independently through learning videos before attend the class. In this flipped learning model, teachers can record their own videos and deliver learning material using various technology applications (video recording software) (Zainuddin & Perera, 2018).

The flipped learning classroom learning method provides a student-centered approach in meeting the demands of today's nursing education and the diversity of current health services. The changes that occurred in the world of nursing after implementing the flipped learning method were that students were more active in learning, theory was taught in an applied form and lecturers provided facilities for students to think critically rather than just providing theory in front of the class (Youhasan et al., 2021)

Learning process at Sahid University in Surakarta has not implemented the flipped learning method and is still using conventional learning methods where lecturers carry out face-to-face learning in the laboratory for basic nursing practicums, but the procedures cannot be put into practice correctly, even though the lecturers have explained and demonstrated them first. The lecturer in charge of nursing courses stated that laboratory meeting sessions were not effective in improving students' laboratory skills because students did not yet understand the procedures and functions of each material that would be demonstrated so that their competency was not achieved optimally.

Based on this background, this learning method is very effective in improving the cognitive and laboratory skills of nursing students and has not yet been implemented at Sahid University, Surakarta, because of this reason the research team, will conduct research on the Effectiveness of Implementing the Flipped Learning Model on Cognitive Learning Outcomes and Laboratory Practical Skills Nursing Student at Sahid University, Surakarta.

2. METHODOLOGY

2.1 Research Design

The design of this research is a quasi-experimental design with a pre-post non-equivalent control group design.

2.2 Population and Sample Used

Sampling used a purposive sampling technique using class A as the class with the application of the Flipped Classroom learning model and class B with the application of the conventional model as the control. The sample in this research was 65 students in the

second semester of the Nursing Science Study Program at Sahid University, Surakarta, with 33 students in the Flipped Classroom class and 32 students in the conventional class.

2.3 Data Collection Techniques

Using purposive sampling technique. Data collection will be conduct from May to June 2024. Before the intervention is given, researchers provide informed consent to respondents. Then the outcomes were measured and respondents were given intervention 6 times for the flipped classroom learning model. Cognitive learning outcomes are measured based on the final semester exam scores, while laboratory practical skills use the existing nursing practicum SOP checklist questionnaire that applies in the nursing laboratory at Sahid University, Surakarta.

2.4 Tools and Instruments Used

This research using the existing and applicable nursing practicum SOP checklist questionnaire in the nursing laboratory at Sahid University, Surakarta. Data analysis was first carried out with a normality test, then a bivariate test was carried out using the paired t-test.

2.5 Data Analysis

Data analysis was first conduct with a normality test, then a bivariate test was carried out using a paired t-test, after the data was collected, the completeness of the data was re-checked, data entry, tabulation and data analysis were conduct with the SPSS package program.

3. RESULTS AND DISCUSSION

3.1 Result

Preparation for lectures is conduct by looking at the learning objectives and competency achievements of the Semester Learning Plan (RPS) that has been prepared. Microbiology teaching material in the Medical Surgical Nursing II course has 6 meetings and 1 week before the meeting the material is given to students. The learning material provided is in the form of material on slides, learning videos, and articles that correspond to the learning topic in the related article. Articles related to the topic of learning disease systems in medical surgical nursing II are provided with the aim that from an early age students are taught to learn in accordance with evidence based. The pre-test is given before each meeting and the post-test is given after the lecture is finished.

Characteristics of respondents based on gender in classes using the Flipped Classroom and conventional applications are dominated by female students. The Flipped Classroom class consists of 3 male students and 30 female students. Meanwhile, in the conventional class the number of men and women was 6 and 26 students respectively (Table 1).

The normality test on student pre-test and post-test data using the conventional and Flipped Classroom models showed that the data was normally distributed ($p>0.05$) (Table 2).

The average scores for students' pre-test and post-test cognitive learning outcomes using the Flipped Classroom model were 55.22 and 81.07, respectively. Meanwhile, the average conventional learning results were 52.40 in the pre-test results and 69.40 in the post-test results. The results of the Paired Sample T-Test show that $p < 0.05$, which indicates that there is an influence from the application of the Flipped Classroom and conventional models on student cognitive learning outcomes. However, the average learning outcomes using the Flipped Classroom application are higher than those using the conventional model (Table 3).

Table 1. Characteristics of respondents based on gender

Characteristics	Group			
Gender	Flipped classroom		Conventional	
	Frequency	Percentage	Frequency	Percentage
Man	3	9,1	6	18,75
Woman	30	90,9	26	81,25
Total	33	100	32	100

Source : Primary data (2024)

Table 2. Normality test results with Shapiro Wilk

Group	pre			post		
	statistic	df	sig	statistic	df	sig
Conventional	0,107	33	0,061	0,093	33	0,200
Flipped Classroom	0,108	32	0,540	0,800	32	0,200

Source : Primary data (2024)

Table 3. Pre-post mean value of flipped classroom and conventional test

Group	Pre test			Post test			*P value*
	N	Mean	SD	N	Mean	SD	
Conventional	32	52,40	8,065	32	69,40	4,875	0,0001
Flipped clasroom	33	55,22	8,112	33	81,07	5,153	0,0001

Source : Primary data (2024)

On the implementation of the conventional method, students are given a pre-test before the lecture and a post-test at the end of the lecture. Lecturers teach according to lecture topics using conventional methods or providing lecture material through lectures. It can be seen that during the lecturer's explanation, students tend to be passive and look bored during the lecture.

The role of lecturers is very active in providing lecture material so that learning is dominated by lecturers compared to students. The time required in the lecture method tends to be longer so that sometimes a discussion cannot be held at the end of the explanation of the material.

3.2 Discussion

The findings of this research show that there is a significant influence on improving nursing student learning outcomes after implementing the Android-based flipped leaning model. The results of this research are in line with (Buhari & Sari, 2022) which shows that there is

an influence of the application of flipped learning models based on Android applications on laboratory skills learning outcomes for nursing students and is proven to improve nursing student learning outcomes.

Learning outcomes are an inseparable part of interaction, process and evaluation of learning so that there are changes in terms of knowledge, attitudes and skills. Student learning outcomes cannot be separated from the teacher's role in designing good and creative learning methods (Kusmaryani et al., 2019). In assessing learning outcomes using authentic and non-authentic assessments. Authentic assessment of learning outcomes through written tests, practicums, tests and exams (Awidi & Paynter, 2019). Increasing practicum learning outcomes is the result of non-authentic learning assessments that are complex and integrated in all educational programs that refer to the curriculum, to achieve student competency (Gonzales et al., 2022).

The flipped learning model is the most effective method applied in practical or laboratory learning because the flipped learning model encourages students to further improve their ability to think creatively and hone their skills (Barbour & Schuessler, 2019). In line with research by (Hadi & Hamid, 2020) the results of his research show that the flipped learning method can increase student involvement in the learning process, thereby making the delivery of learning material more effective and efficient.

Laboratory practical learning is a learning method used to hone psychomotor skills, knowledge and attitudes. These three skills will help students develop their competence when carrying out clinical practice in hospital facilities and so that learning is more effective in developing students' skills, one of which is using the flipped learning learning model (Muhajarah & Sulthon, 2020). The flipped learning method in laboratory practicum allows students to produce better learning because it increases the opportunity to practice more in the experimental process in the laboratory (Çelik et al., 2021).

It can be concluded that the Flipped learning model is the best model that can be used in laboratory courses, which can move students' attitudes with videos and various animations to a higher level, and allows them to develop laboratory self-efficacy. Self-efficacy is defined as a person's belief in their ability to achieve a certain level of performance (Kara & Kayacan, 2023). (Heijstra & Sigurðardóttir (2018) in Çelik et al., (2021).reported that in their research flipped learning had its own advantages compared to traditional classes. This advantage allows recordings to be displayed online, and students can view the recording multiple times, pause to take notes, delete again if something is unclear and view the recording at their own pace. The opportunity to take notes more than once can support or motivate students to study a subject more effectively. Apart from that, the flipped learning method has provided benefits for students because it is useful for students who are hesitant to ask questions and has the opportunity to watch videos to understand them.

4. CONCLUSION

The flipped learning method has been proven to encourage students to think more creatively in developing their abilities. The flipped learning method has many advantages in laboratory learning where students can review the recorded results of courses taught by video and also provides benefits to students. If there are students who are hesitant to ask questions, students can watch the video of the learning results again until they understand the lesson.

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