

Effect of Blended Learning in Nursing Education

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Abstract

This study is a pre-post design experimental research on a nonequivalent control group with the aim of identifying the effects of blended learning in nursing education on critical thinking and learning satisfaction of the nursing students. The research subjects were 79 second-year nursing students of K University in G region, composed of 39 students in the control group and 40 students in the experimental group, gathered through convenience sampling. The two groups equally went through the pre-test using the questionnaire for data collection. Afterwards, blended learning was applied to the experimental group for three weeks in total. The collected data was analyzed using the SPSS PC+20.0 for windows. According to the research, the experimental group that participated in blended learning had a statistically significantly high score for critical thinking ($t=-6.21$ $p<.001$) and had a high, but not statistically significant, score for learning satisfaction ($t=-.52$, $p=.683$). Given the research findings, it was determined that blended learning in nursing education was more effective in improving the critical thinking of nursing students than the existing nursing education curriculum.

Keywords: Blended Learning, Critical Thinking, Learning Satisfaction

1. Introduction

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1.1 Necessity of the Study

In modern society, the kinds of the diseases of those in need of nursing care have become diverse, the severity of the diseases has become more acute and the medical environment has become more complicated. In addition, it is essential to clinical nursing to guarantee the safety of those in need of nursing care and provide them with high quality nursing care in the course of performing clinical nursing. To meet the requirements of society, nursing education requires the students to develop clinical nursing judgment and capabilities to a significant degree so that they can apply learned knowledge and technologies in order to address the health issues of those in need of nursing care [1]. Due to weaknesses of conventional education methods, which is taught by rote, focusing on lectures and lack of connection with and relevance to education content, and the lack of competence of nursing students in real situations because of repetitive training methods conducted in a passive manner, it is somewhat difficult to cultivate nurses who have the proper and adequate nursing capabilities required by nursing practice [2]. To overcome these problems, it is necessary not only to connect knowledge, skills and attitudes with each other in the nursing education process but also to actively utilize teaching methods that can overcome the limitations of on-site learning. Recently, attempts are increasing to introduce teaching and learning strategies to nurture integrative thinking and problem-solving skills in clinical nursing. In addition, there are more cases where problem-based

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learning and simulation techniques are being utilized in medical education and nursing education.

The new learning method is causing stress to students [3] and self-directed learning through computer-based learning is a reporting that can replace the clinical practice due to lack of experience[4]. Blended learning is regarded as a blended form of teaching methods and has been used by online educationalists in the U.S. since 2000 [5].

Blended learning adopts various strategies depending on the educational subjects, including online learning strategies and offline assistive ways focusing on group activities.

Blended learning affects students' learning satisfaction: it meets learning needs, enables customized learning appropriate for different learning styles of learners and creates a learner-centered approach [6]. Besides, as everyone has his or her own learning style, there is no media that can satisfy everyone. However, a mixture of media can satisfy more people. Furthermore, this blended learning approach is rich in pedagogical strategies and resources to enable the utilization of different learning tools [7].

The use of blended learning is showing students a variety of advantages, standard patient learning and practice-based learning has been reported that improves the performance and skills of nursing students' communication skills [8].

It is not easy to create or realize very big learning effects based on the fragmentary and uniform education methods in nursing education that requires correct understanding and judgement and integrated thinking about patients' conditions in the clinical field. Although there are a growing number of cases where teaching methods are blended and applied to learning in other educational fields, the various research on the effects or critical thinking of blended learning in nursing education are few compared to other studies. Therefore, this study aimed to identify the effects of blended learning in nursing education on critical thinking and learning satisfaction of nursing students.

1.2 Research Purpose

This research aimed to verify the effects of blended learning on the critical thinking and learning satisfaction of nursing students. The content included watching a simulation video on nursing skills, discussion class and application of nursing examples using standardized patients.

1.3 Research Hypothesis

Hypotheses to be substantiated through this research are as follows:

Hypothesis 1: The experimental group consisting of participants engaging in blended learning will have a higher score with regard to critical thinking disposition compared to the control group.

Hypothesis 2: The experimental group consisting of participants engaging in blended learning will have a higher score with regard to learning satisfaction compared to the control group.

1.4 Definition of Terminology

A. Blended learning

Blended learning is a strategy to maximize learning effects by combining on-line and off-line learning environments. This is defined as a design strategy to produce the best learning effects through the combination of different learning factors such as learning goals, learning methods, learning time and space, learning activities, learning media and interaction patterns [9]. Blended learning in this research means a blended learning approach that includes watching videos and debating classes focusing on urination nursing.

B. Learning satisfaction

Learning satisfaction includes motivational and cognitive aspects of learning and

means a learner's own feeling about learning through the overall learning process [10]. This research outlines the results of an investigation using questionnaires revised and complemented based on the items created by Shin (2003) and the items about learning satisfaction devised by Kwon (2010).

C. Critical thinking disposition

Critical thinking disposition means personal disposition regarding the valuing and use of critical thinking in individual acts or professional tasks [11]. In this research, critical thinking disposition is represented by the scores measured using a tool for measuring critical thinking disposition, which was developed by Yoon (2004) targeting nursing students [12].

2. Research Methods

2.1 Study Design

This study is a pre-post design on a nonequivalent control group to verify the effect of blended learning on the second-year students of a nursing university.

Table 1. Research Design for Experimentation

Group	Pre-test	Intervention	Post-test
Experimental group	E ₁	X ₁	E ₂
Control group	C ₁	X ₂	C ₂

- E₁: Pre-test of Experimental Group
- E₂: Post-test of Experimental Group
- C₁: Pre-test of Control Group
- C₂: Post-test of Control Group
- X₁: Blended learning
- X₂: Self Directory Learning

2.2 Research Subjects

The research subjects were second-year students of a nursing university in G region, who have no experience of blended learning, focusing especially on urination nursing among the education items of basic nursing practice. Among the total of four classes, two classes were assembled through convenience sampling and were assigned to the experimental group of blended learning and the remaining two classes were assigned to the control group that applied the existing autonomous practice of basic nursing. In the end it was determined that the experimental group be composed of 40 people and the control group be composed of 39 people.

2.3 Study Tools

A. Learning Satisfaction

Experts tested the validity of the questionnaires, which were revised and complemented based on the items about learning satisfaction devised by Kwon and the items developed by Shin (2003) to measure learning satisfaction. A questionnaire about learning satisfaction was composed of a total of 10 items, and the reliability of the questionnaire was .885. The 5-point Likert scale ranging from 'strongly disagree' with the lowest score to 'strongly agree' with the highest score was used for rating each item. The highest score is 50 points, and the lowest score is 10 points. The higher the score is; the higher learning satisfaction becomes. The reliability in this study was .75.

B. Critical Thinking Disposition

A tool for measuring critical thinking disposition developed by Yoon (2004) was used to measure critical thinking disposition. The questionnaire was composed of 7 sub-areas including a total of 27 items such as 5 items related to intellectual passion and curiosity, 4 items related to prudence, 4 items related to self-confidence, 3 items related to systemicity, 4 items related to intellectual fairness, 4 items related to healthy skepticism and 3 items related to objectivity. The 5-point Likert scale ranging from 'strongly disagree' with the lowest score to 'strongly agree' with the highest score was used for rating on each item. The total score ranges from 27 to 135 points. The higher the score is; the stronger critical thinking disposition is. The reliability of a research tool developed by Yoon (2004) was Cronbach' α = .84. The reliability of this research was .79.

2.4 Program Development Process

This research developed a blended learning program by selecting urination nursing as a learning topic from the book of goals of nursing studies. The blended learning program was composed of a catheterization video education in the first stage, a discussion class that supplements the video education in the second stage and clinical case application using standardized patients in the third stage. The program was provided for 6 hours in total, composed of two-hours of education for each stage for three weeks. In the first stage, the students watched a video on intubation of self-retaining catheter, developed focusing on the protocols of key nursing skills of Korean Accreditation Board of Nursing for five times, and pointed out and reviewed the errors of the theory and practice in the video. In the second stage, after discussing the errors and watching the video, the students freely expressed their ideas on the errors in the nursing treatment, developed cases and reproduced the procedure of catheterization. In the third stage, the clinical examples were applied to patients who have difficulties in urinating, using standardized patients and a nursing simulator.

2.5 Data Collection Procedures

This research was conducted in the order of pre-test, experimental treatment and post-test and the written consent of the research subjects participating was obtained after sufficiently explaining that they would remain anonymous and confidentiality would be maintained. The questionnaire was distributed to the subjects within the period of research accompanied with verbal explanation and filled out by the subjects in their own handwriting. The research subjects were 79 second-year nursing students of K University in G region gathered together through convenience sampling, and the control group was composed of 39 people and the experimental group was composed of 40 people. The subjects completed the theory class on techniques to facilitate urination lasting four hours during the basic nursing course. The two groups equally went through the pre-test. The experimental group adopted the blended learning method for three weeks while the control group received cases on difficulties in urinating and were provided with autonomous learning time. After the practice course, the post-test was conducted on both groups at the same time.

2.6 Ethical Considerations

The purpose and process of the research were explained to the research subjects and the consents to spontaneous participation were obtained from them. It was explained to them that research results would not be used for any purpose other than for the purposes of the research. After a post-survey was concluded, an education program for blended learning was carried out among the control group utilizing the same methods as the methods for the experimental group.

2.7 Data Analysis Methods

Collected data was analyzed using SPSS PC+20.0 for windows.

- A. Independent t-test was conducted to test general characteristics and homogeneity of human subjects.
- B. Critical thinking disposition and learning satisfaction before and after the mediation of the experimental group and control group was analyzed using t-test.
- C. Cronbach's α was calculated to measure the reliability of a measurement tool.

3. Results of Research

3.1 Test of Characteristics and Homogeneity of Research Subjects

An analysis was conducted on the homogeneity between the experimental group and control group according to general characteristics before the implementation of the blended learning education program. As a result, there was no significant difference between the two groups, which confirmed their homogeneity (Table 2).

Table 2. Homogeneity Test of General Characteristics Between Experimental and Control Group

	Experimental group (n=40)	Control group(n=39)	t	p
	<i>M SD, n(%)</i>	<i>M SD, n(%)</i>		
Academic performance				
4.0 <	5(12.5)	5(12.8)	4.023	.320
3.5-4.0	12(30.0)	13(33.3)		
3.0~3.5	10(25.0)	11(28.2)		
2.5~3.0	9(22.5)	7(17.9)		
2.0 and below	4(10.0)	3(7.7)		
Reason for selection				
Employment rate	12(30.0)	13(33.3)	1.896	.389
Aptitude	6(15.0)	7(17.9))		
Academic performance in high school	1(2.5)			
Recommendation for others	10(25.0)	9(23.0)		
Volunteer work	4(10.0)	5(12.8)		
Good feeling for nurses	7(17.5)	5(12.8)		
Favorite teaching method				
Lecture	26(65.0)	23(60.0)	1.323	.412
Group discussion	2(5.0)	2(5.1)		
Simulation classes	12(30.0)	14(35.9)		

3.2 Pre-Test of the Homogeneity about Dependent Variables of Experimental and Control Groups

An analysis was conducted on the homogeneity of critical thinking disposition and learning satisfaction before the implementation of the blended learning education program. As a result, there was no significant difference between the two groups, which confirmed their homogeneity (Table 3).

Table 3. Homogeneity Test on the Dependent Variables between Experimental and Control Groups

	Experimental group(n=40)		Control group(n=39)		t	p
	M	SD	M	SD		
Critical thinking disposition	95.95	10.63	96.43	11.83	.83	.591
Learning satisfaction	38.95	9.86	36.51	10.5	-.69	.526

3.3 Hypothesis Verification

It was expected that the results for the experimental group as participants in blended learning would be higher with regard to scores for critical thinking disposition compared to control group, and the 100.47(8.92) points for the experimental group was significantly higher than the 96.92(10.63) points for the control group ($t=-6.21$ $p<.001$). Consequently, Hypothesis 1 was supported.

Table 4. Competence of Critical Thinking Experimental and Control Group

Dependent variable	Groups	Pre-test		Post-test		t	p
		M	SD	M	SD		
critical thinking	Exp(n=40)	95.95	10.63	100.47	8.92	-6.21	<.001
	Cont(n=39)	96.43	11.83	96.92	10.63		

It was expected that the results for the experimental group as participants in blended learning would be higher with regard to scores for learning satisfaction compared to the control group, and the 41.85(6.83) points for the experimental group was higher than the 38.72(7.16) points for the control group. However, there was no statistically significant difference ($t=-.52$, $p=.683$), and so Hypothesis 2 was rejected.

Table 5. Competence of Learning Satisfaction Experimental and Control Group

Dependent variable	Groups	Pre-test		Post-test		t	p
		M	SD	M	SD		
Learning satisfaction	Exp(n=40)	38.95	9.86	41.85	6.83	-.52	.683
	Cont(n=39)	36.51	10.5	38.72	7.16		

4. Discussion

There was a significant difference in critical thinking disposition between the experimental group, which received urination nursing education based on blended learning, and the control group. This result was consistent with the result of a study by Heo and Roh (2013) after the application of nursing simulation education focusing on debriefing, among similar studies which integrated multiple teaching methods [13]. Also, that result was consistent with the results of a study by Kim *et al.* (2012) where an

experimental group underwent a 10-week nursing simulation-based integrated clinical practice program got higher scores in critical thinking disposition compared to a control group that received conventional lectures and clinical practice education [14]. On the other hand, according to the result of a study by Joo (2006), there was no significant difference in the scores in regard to nursing students' critical thinking disposition as a result of a measurement after problem-based learning, lectures, skill exercises and simulation practices were carried out [15]. Aside from learners' passive attitudes in lecture-based education, this study intended to strengthen critical thinking skills of blended learning applying new case development by reviewing learning materials and researching the problems logically through group discussions.

There was no significant difference in learning satisfaction between the control group and the experimental group that received urination nursing education based on blended learning. This result is inconsistent with the results of many previous studies that demonstrated that blended learning improved learning satisfaction. Blended learning, which is one of the integrated teaching methods, makes the learners get out of typical learning, improve their intellectual satisfaction, and actively participate in classes with a sense of curiosity and enthusiasm for learning. Through this research found that current second-year nursing students have a poor understanding and experience in self-directed learning, and have difficulty in getting used to discussion learning. Since the period of the program application was not more than 3 weeks, time for adjusting to a new learning method was short; according to the result of a pre-test about students' preference regarding learning methods, their preference for lecture-based education was much stronger compared to other methods.

5. Conclusion

There was no difference regarding hand washing knowledge among college students in nursing education who received hand washing education before and after the education program was implemented, but a positive improvement was shown in their attitude and performance level regarding hand washing, verifying the effect of the hand washing education program. It would be valuable to carry out a follow-up study to check the long-term effect of the hand washing education program and verify whether the habit of hand washing has been established as a habitual practice.

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