Effect of PBL on Self Leadership, Nursing Leadership, Confidence in Nursing Students Applying Flipped Learning

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Abstract

This is a group pretest-posttest design study that aim to evaluate the effect of problem-based learning using flipped learning to self leadership, nursing leadership, and confidence of nursing students. The subjects were 87 4th nursing students who took nursing management from March 15 to April 26, 2021. A questionnaire was used to measure self leadership, nursing leadership, and confidence. The measurement of self leadership is a 5-point Likert scale that employs a questionnaire. Flipped learning uploaded a 5-8 minute lecture video, and the subjects learned on learning management system, using smart device. PBL teaching was developed about personal growth, cooperation, nursing excellence, creative problem solving, influence. As a result of the study, self leadership was significantly improved after education than before education(t=-6.27, p<.001). Nursing leadership and confidence were significantly changed before and after education(t=-16.10, p<.001; t=-2.37, p<.001). According to the results of this study, the PBL teaching method using flipped learning is an effective teaching and learning strategy for improving leadership, and confidence. In future studies, it will be necessary to develop and verify specific teaching and learning methods by applying nursing experts in consideration of the type of leadership.

Keywords: Nursing students, Problem-based learning, Flipped learning, Leadership, Confidence

1. INTRODUCTION

In the global information age, in which knowledge and environment are rapidly changing, personal change and growth are required according to the flow[1]. The nursing environment is rapidly changing due to the increase in demand due to the diversification of subjects and the development of science. Because traditional lecture-style classes emphasize learning to passively remember and understand new information delivered by instructors, it is not easy to promote higher-order thinking of learners[2].

Problem-centered learning refers to a teaching-learning method in which learning takes place in the process of solving problems and composing products through cooperation between learners centered on a single problem[3]. In addition, in order to overcome the limitations of the traditional classroom environment and to aim for the learner's activity-oriented classes, the teaching method called flipped learning is attracting attention. Flipped learning has the advantage of allowing learners to learn the core content they need to know before entering this class, allowing classes to take into account the level and needs of each student[4]. It is being applied as a method to increase the efficiency of education by actively utilizing online contents. Therefore, in

the flipped learning-based problem-centered learning, learners can use the information acquired outside the classroom as a resource to develop outputs in the activities inside the classroom, and through the close connection between the lessons outside the classroom and inside the classroom, they can achieve their learning goals more effectively[6], education that can produce students with the nurse competency required in the health care field can be provided.

On the other hand, nursing organizations that experience rapid changes in the medical environment are required to have nurse leadership as an essential element as the desire to expand their professional fields increases There is a growing interest in competence. Self-leadership is a set of thinking and behavioral strategies used to influence oneself, and is an autonomous force that guides oneself toward high performance [1,7]. Distinguished from self-leadership, the nurse's five leadership competencies are presented as personal growth, cooperation, nursing excellence, creative problem solving, and influence, and experts emphasize that systematic education should be carried out[8]. Self-leadership and nursing leadership are essential competencies for nursing professionals who require autonomy and responsibility.

So far, the flip-learning classes have been conducted in basic nursing practice[9], practice in mental nursing, practice in women's health nursing[10], and the theory of adult nursing[11,12], health education[13], and health assessment theory and practice subjects[14,15]. However, the teaching-learning method combining flipped learning and problem-focused learning was not applied in nursing management subjects.

Therefore, this study intends to provide basic data for establishing teaching-learning strategies by identifying the effects of a class applied with flipped learning-based problem-focused learning on self-leadership, nursing leadership, and confidence of nursing students.

2. RESEARCH METHOD

2.1   Research design

This study is a similar expreimental study before-and-after a single group to evaluate the effect of problem-based learning using flipped learning to self leadership, nursing leadership, and confidence of nursing students(Figure 1).

Before education	Intervention	4 Week after education
Self leadership	PBL applied Flipped Learning	Self leadership
Nursing leadership	- Personal growth	Nursing leadership
Confidence	- Cooperation	Confidence
	- Nursing excellence	
	- Creative problem solving	
	- Influence	
	Utilized Device	
	- PC	
	- Tablet PC	
	- Smart Phone	
	E-class system	
	- Video contents(5-8 minutes)	

Figure 1. Research Design

2.2   Research subjects and data collection

The subjects of this study are 4th nursing students who took nursing management. Before data collection, the research subjects were purpose and method, confidentiality and research of personal information ensuring anonymity of participation, consent and refusal to participate. There is no penalty, and the collected data is used only for research purposes. Data should be discarded after being stored for 3 years after completion of the study. It was explained that in any case, it can be stopped at any time and that the freedom of expression of the research participants is guaranteed. In particular, it was explained to the subjects that there were no disadvantages in the evaluation and grades related to the class and that there was no loss of class due to the research, and consent was obtained. Subjects who participated in the survey wrote the same characters that could identify themselves in the pre-post survey so that they could be matched. 92 students participated in the pre-question survey and 89 students participated in the post-question survey, and 89 students participated in both the pre-post survey and were able to match. Of these, a total of 87 people, excluding two who responded insincerely to the questionnaire, were subjected to final analysis. The number of study subjects was calculated using the G power 3.1.9.2 program with a significance level of .05, an effect size of .5, and a power of .95. As a result, the minimum number of subjects required for the t-test was calculated as 45, which is the size of the number of samples for the study, was found to be satisfied.

2.3 Research tools

2.3.1 Self leadership

It was measured using a tool developed by Manz [7] and modified and supplemented by Kim [16]. The items are divided into a total of 6 factors, with a total of 18 items, including 3 items of self-expectation, 3 items of rehearsal, 3 items of goal setting, 3 items of self-reward, 3 items of self-criticism, and 3 items of constructive thinking. Scores range from 18 to 90, and on a 5-point Likert scale, 'not at all' to 'always' at 5 points, with higher scores indicating higher self-leadership. In the study of Kim [16], Cronbach's α=.87, and in this study, Cronbach's α=.91.

2.3.2 Nursing leadership

Nursing leadership was composed of five parts: personal growth, cooperation, nursing excellence, creative problem solving, influence. A visual analogue scale was used to measure nursing leadership. This measurement tool is easy to collect and has relatively good reliability according to short-term changes. In this study, a 10 cm mark was used to indicate no confidence at all, and 10 for very confident. The higher the number, the higher the nursing leadership.

2.3.3 Confidence

A visual analogue scale was used to measure confidence. A 10 cm mark was used to indicate no confidence at all, and 10 for very confident. The higher the number, the higher the confidence.

2.4 Data Analysis Method

The collected data were encoded. To verify the effectiveness of this study, the data collected through pre- and post-tests were analyzed as follows using the SPSS 24.0 program. The study variables were calculated by frequency, percent, mean, standard deviation. In order to verify the effectiveness of the flip learning-based PBL class, the difference in pre and post-value changes for self-leadership, nursing leadership, and confidence

was analyzed through a paired t-test. The reliability of the measurement tool was analyzed by Cronbach's α.

2.5 Research Process

In this study, flip-learning is a pre-learning video of about 5-8 minutes so that the researcher can learn important content in advance without getting bored. Video contents were uploaded on learning management system. Students take the initiative in offline learning, which is the main class. Flip-learning videos were applied and utilized as a pre-learning, and even after offline classes, they could be watched repeatedly. Based on the characteristics and advantages of the flip-learning-based PBL class, the PBL task was presented in advance in the pre-learning for an efficient class, and preparatory activities were conducted to solve the task. In this class, it was made possible to solve problems by collaborating through interaction. Therefore, in this study as well, in the pre-learning, videos and PBL-related tasks and learning materials were presented in advance so that they could be prepared. Problem-focused learning contents include personal growth, cooperation, nursing excellence, creative problem solving, and influence. Various individual and group learning was actively carried out through learner-centered instructional methods such as discussion, PBL, etc.

3. RESEARCH RESULTS AND DISCUSSION

3.1 General characteristics

In the general characteristics of the subjects, 16 males(18.4%) and 71 females(81.6%) by gender had experiences in flip learning and problem-centered learning.

3.2 Self leadership of the subjects

Table 1 shows self leadership of the subjects. Self-leadership was statistically significantly increased from 3.69±0.57 before the intervention to 4.09±0.50 after the intervention after the problem-centered learning teaching method using flip learning was implemented(t=-6.27, p<.001). Among the detailed items, self-expectation increased from 3.55±0.79 points to 3.95±0.69 points, rehearsal increased from 3.91±0.78 points to 4.30±0.58 points, and goal setting increased from 3.76±4.13 points to 4.13±0.63 points, which was statistically significant(t=-4.71, p<.001; t=-5.06, p<.001; t=-4.12, p<.001). Self-reward increased from 4.23±0.69 points to 4.44±0.53 points, self-criticism increased from 3.41±1.05 points to 3.94±0.84 points, and constructive thinking increased from 3.25±0.86 points to 3.77±0.79 points, which was statistically significant(t=-2.36 p=.021; t=-4.16, p<.001; t=-5.89, p<.001).

Table 1. Self leadership of the Subjects (N=87)

Variable rate	Before education	After education	t (*p* value)
Self leadership	3.69±0.57	4.09±0.50	-6.27(<.001)
Self expectation	3.55±0.79	3.95±0.69	-4.71(<.001)
Rehearsal	3.91±0.78	4.30±0.58	-5.06(<.001)
Goal setting	3.76±0.13	4.13±0.63	-4.12(<.001)
Self reward	4.23±0.69	4.44±0.53	-2.36(.021)
Self criticism	3.41±1.05	3.94±0.84	-4.16(<.001)
Constructive	3.25±0.86	3.77±0.79	-5.89(<.001)

3.3 Nursing leadership of the subjects

Table 2 shows nursing leadership of the subjects. Nursing leadership was statistically significantly increased from 5.35±1.35 before the intervention to 7.76±1.09 after the intervention after the problem-centered learning teaching method using flip learning was implemented(t=-16.10, *p*<.001). Among the detailed items, personal growth increased from 5.30±1.42 points to 7.68±1.22 points, coperation increased from 6.33±1.73points to 8.74±1.60 points, and nursing excellence increased from 5.20±1.59 points to 7.36±1.40 points, which was statistically significant(t=-16.25, *p*<.001; t=-16.25, *p*<.001; t=-12.86, *p*<.001). Creative problem increased from 4.94±1.60 points to 7.47±1.46 points, Influence increased from 4.97±1.63 points to 7.52±1.43 points, which was statistically significant(t=-12.43, *p*<.001; t=-13.97, *p*=.021; t=-2.37, *p*<.001).

Table 2. Nursing leadership and confidence of the Subjects (N=87)

Variable rate	Before education	After education	t *(p* value)
Nursing leadership	5.35±1.35	7.76±1.09	-16.10(<.001)
Personal growth	5.30±1.42	7.68±1.22	-16.25(<.001)
Cooperation	6.33±1.73	8.74±1.60	-12.86(<.001)
Nursing excellence	5.20±1.59	7.36±1.40	-11.94(<.001)
Creative problem solving	4.94±1.60	7.47±1.46	-12.43(<.001)
Influence	4.97±1.63	7.52±1.43	-13.97(.021)
Confidence	5.24±1.36	7.94±1.35	-2.37(<.001)

3.4   Confidence of the subjects

The confidence of the subjects was shown in Table 2. Confidence was statistically significantly increased from 5.24±1.36 before the intervention to 7.94±1.35 after the intervention(t=-2.37, *p*<.001).

Among the results of this study, when checking each sub-factor of self-leadership, it was confirmed that self expectation, rehearsal, goal setting, self reward, self criticism, and constructive had statistically significant effects. Looking at the sub-factors of nursing leadership, personal growth, cooperation, nursing excellence, creative problem solving, and influence had statistically significant effects. The educational effect of previous studies [16] applying problem-centered learning based on flip learning is being verified. In this study, it is thought that the effect was shown because of the cooperative learning environment in which each team solves problem situations in the in class and the additional opportunity for interaction between the teacher-student and the student-student in the After Class.

4. CONCLUSIONS AND SUGGESTIONS

When learners encounter various problems, they need education to cope with and solve the problems independently in the process of solving the problems, so in this study, a PBL class based on flip learning was presented as a methodology. Flip learning is being applied in various ways, such as basic nursing practice[17], mental nursing[18], women's health nursing[19], and industrial nursing[20]. As a result of this study, self-leadership, nursing leadership, and confidence was significantly improved after implementing the problem-centered learning teaching method applying flip learning. Comprehensive analysis of the results of previous studies and this study, PBL teaching method applying flip learning can be said to be an effective teaching and learning strategy.

Based on the above research results, I would like to make the following suggestions for future follow-up research. First, in the follow-up study, it is necessary to expand the scope for university students of more diverse grades and confirm the results of this study later by comparing it with the control group. Second, it is necessary to check the effect of the flip learning-based PBL class with various variables.

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