

## Effects of flipped-learning teaching-learning model for the competencies enhancement on fundamental nursing practice



Ji Won Oak\*

Nursing Department, Tongmyong University, Busan, South Korea

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### ABSTRACT

The purpose of this study is to analyze the effect of applying a flipped-learning class designed for the purpose of strengthening major competency through basic nursing practice education for nursing students. The study was designed as a single-group pre-post-mortem study. A total of 36 subjects were studied, and online and offline hybrid-type classes were offered from October 5 through November 13, 2020, with a flipped-learning class model that applied the 'PRTER' model modified to fit the practice model to strengthen basic nursing practice competency. In order to confirm the effect of the study, self-directed learning ability, critical thinking tendency, and core nursing skills performance ability (transfusion nursing, tracheostomy tube management) were checked before and after the experiment. The collected data were analyzed using the SPSS Win version 26.0 program to analyze the general characteristics and dependent variables with descriptive statistics such as frequency and percentage and paired t-test. As a result of the study, self-directed learning ability ( $p < .05$ ), critical thinking dispositions ( $p < .01$ ), and core basic nursing skills performance ( $p < .001$ ) were significantly improved. The results of this study are meaningful because the flipped-learning teaching and learning model was introduced to the unstable class environment caused by COVID-19, thereby engaging learners as active participants in education, and strengthening their practical competency.

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### 1. Introduction

After COVID-19, face-to-face classes repeat permission and restrictions due to social distancing and quarantine stage guidelines, and practical education faces a new problem of learning deficits and gaps. This is a phenomenon that is also applied in nursing, where practical education plays an important role. In particular, basic nursing education, in which students entering the Department of Nursing learn the meaning and concept of basic nursing and apply it to clinical practice, has become a situation in which it is necessary to explore new changes.

Fundamental nursing is an essential course in the Department of Nursing that connects theory and practice. The current fundamental nursing practice education consists of lectures and demonstrations,

watching videos, and repeated training centering on the target model required for nursing skills, so there is a limit to developing individual competencies of students (Kim and Kim, 2017; Je and Nam, 2017). To supplement this, various teaching methods are being applied, for example, education using smartphones (Kim, 2017), S-PBL (Kang and Choe, 2016), and providing education using video. However, even these methods, which are being suggested as alternatives, are being raised as problems because they are difficult to apply easily as there are restrictions on face-to-face classes in education after COVID-19. It is necessary to pay attention to the introduction of a new educational method that can be used in both face-to-face and non-face-to-face class situations.

Flipped-learning is a teaching method that assumes that students have done the learning related to the content before class. This teaching method is very useful for flexibly changing the class time in a class where face-to-face and non-face-to-face classes are mixed, such as COVID-19. In addition, rather than passive lectures on the class content, it is a representative that students and students or students and teachers ask questions and answers, interact and discuss what they have

\* Corresponding Author.

Email Address: [jiwonoak@gmail.com](mailto:jiwonoak@gmail.com)

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Corresponding author's ORCID profile:

<https://orcid.org/0000-0002-3687-2981>

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learned, and perform supplemental or intensive learning according to the results (Kim, 2014), thereby enhancing the ability of learners. In other words, it is possible to participate in deep learning through utilization and application beyond the understanding of lectures by pre-learning the prerequisite knowledge through various technologies and media outside the classroom and performing team-based learning activities in the classroom. In addition, as an advantage, it activates constructivist learning in which learners reconstruct their knowledge and experiences in the learning process based on their current knowledge and experiences as the subject of the class (Park and Park, 2016). By creating a communication-oriented learning culture and providing learner-centered education, learners can become active agents who can solve the challenges and problems they face on their own (Park and Park, 2016). In this way, flipped-learning makes students active learners (Park and Park, 2016) and improves learning motivation (Son et al., 2015) and self-directed learning ability (Park and Park, 2016). Even in non-face-to-face education, students can strengthen their ability to learn on their own. In addition, it is evaluated effectively to enhance cooperative communication and activities in class (Yoshida, 2016). It has also been reported that learning outcomes can be maximized by preparing for flipped-learning for successful class operation (Choi et al., 2015). The advantage of this flipped-learning learning method is that students can be motivated even in non-face-to-face education or a hybrid class that combines face-to-face and non-face-to-face education. The students thought that their learning ability could be strengthened through continuous learning through the flipped-learning learning method.

Flipped-learning research conducted in domestic university education can be divided into topics such as effectiveness verification study, design strategy, and model development study. The effectiveness verification study applied flipped-learning to the liberal arts curriculum (Shin, 2014) and teaching class (Kim, 2014). There have been studies that verified the learning effect by applying it and studies that confirmed the improvement of self-efficacy (Chun, 2014). In addition, research on design strategy and model development focusing on/offline linkage strategies (Han et al., 2015) and research on developing a flipped-learning teaching/learning model and applying it to subjects (Choi and Kim, 2015) are reported. In nursing education, the introduction of flipped-learning continues to increase. Health assessment and practical education (Cho and Kim, 2016), the effect on self-efficacy, critical thinking ability, and communication ability of nursing students (Lee and Eun, 2016), the relationship with the NCLEX-RN score, the US national nurse examination (Della, 2015), and core basic nursing performance (Je and Nam, 2017) have been reported. However, there are few studies on the application of flipped-learning related to basic

nursing education. Only studies that confirmed the effects of self-practice reinforcement on learning motivation and academic self-efficacy (Gu, 2016) and studies that confirmed the effects of self-directed learning ability and critical thinking (Kim and Kim, 2017) are reported. It is thought that research on the introduction of flipped-learning and a hybrid teaching model using flipped-learning is necessary to strengthen the practical major competency.

Therefore, this study intends to suggest an alternative method of combining pre-education and face-to-face classes through flipped-learning as a way to compensate for the unstable face-to-face class environment after COVID-19. The purpose of this study is to confirm the learning effect of students as active participants by applying flipped-learning to basic nursing practice education. It is intended to provide basic data for effective teaching and learning strategies by analyzing the effects of this educational method on the major competency of basic nursing practice derived based on the ADDIE model.

## **2. Method**

### **2.1. Study design**

This study was conducted as a single group pre-post research study to analyze the effect of applying the flipped-learning class designed for the purpose of strengthening major competency through basic nursing study practice education for nursing students.

### **2.2. Subjects**

The study period was from October 5 through November 13, 2020, for a total of six weeks, and was conducted using a convenience sample of students taking basic nursing practice education among second-year students of one nursing department located in B city. The sample size of subjects required to conduct this study was determined using the G\*Power 3.1.9.7 program. Two-sided tests, effect sizes=.50, power (1- $\beta$ )=.80, and  $\alpha$  err prob=.05 were applied to confirm the required sample size of 34 people. Considering the dropout rate, the number of study subjects was set to 40, and the contents were notified to the sample group for one week. In consideration of the characteristics of the research subjects belonging to the weak group in research ethics, the following contents were explained to the subjects: Research purpose, anonymous participation in the study, giving up after participating in the study is possible, participation in this study is independent of grades, and participation can be decided voluntarily. All of the above were notified to the sample group non-face-to-face, and applications for participants were received. In order to confirm the effect of education, a participation number was randomly assigned, and the subjects were notified to memorize the number. In the post-examination, subjects were asked to

enter the same number themselves. Among the study subjects who applied for voluntary participation, subjects with many non-response, subjects who gave up halfway, and subjects with a mismatch of prior and post numbers were excluded, leading to the 36 remaining subjects.

**2.3. Instruments**

In this study, general characteristics, self-directed learning ability, critical thinking disposition, and core basic nursing skills performance (transfusion nursing, tracheostomy tube management) were confirmed. For the general characteristics, subjective major adaptation, major satisfaction, basic nursing practice satisfaction, subjective problem-solving ability, self-directed learning level, and importance of basic nursing learning practice were investigated.

**2.3.1. Self-directed learning ability**

Self-directed learning ability was measured using a tool developed by the Korea Educational Development Institute (Lee et al., 2003) to measure the life skills of college students and adults. This tool has a total of 40 items, a five-point scale, and consists of three competency factors: learning plan, learning execution, and learning evaluation. The higher the score, the higher the self-directed learning ability. At the time of development, the reliability of the tool was Cronbach's  $\alpha=.92$ , and the reliability of each sub-domain was .89 for learning plan, .81 for learning execution, and .75 for learning evaluation. In this study, the reliability of the tool was Cronbach's  $\alpha=.93$ , and the reliability of each sub-domain was .86 for learning plan, .82 for learning execution, and .83 for learning evaluation.

**2.3.2. Critical thinking propensity**

The score was measured using the critical thinking propensity measuring tool developed by Yoon (2004) for nursing students. A higher score

means higher critical thinking propensity. Critical thinking tendency has a total of 27 items and consists of seven areas: Intellectual passion/curiosity five items, prudence four items, confidence four items, systematic three items, intellectual fairness four items, health skepticism four items, and objectivity three items. Each item is on a Likert five-point scale, and the higher the score, the higher the critical thinking ability. In Yoon's (2004) study, the reliability of the tool was Cronbach's  $\alpha=.84$ . In this study, it was Cronbach's  $\alpha=.94$  (Table 1).

**2.3.3. The core basic nursing skills performance**

The core basic nursing skills performance was measured with a tool developed by the researcher with two experts as a score to measure the core basic nursing skills of tracheostomy tube management and transfusion nursing. A total of 26 questions consisted of 16 common questions on core basic nursing skills, 5 questions on tracheostomy management performance, and 5 questions on blood transfusion nursing performance. The score consists of an integer from 0 to 10 for each item, with 0 being 'not at all confident' and 10 being 'very confident' to indicate the level of performance. It ranges from 0 to 10, with a higher score indicating higher confidence. In this study, it was Cronbach's  $\alpha=.99$ .

**2.4. Data collection**

The flipped-learning model used in this study was applied to the 'PARTNRT' model, a flipped-learning teaching and learning model developed by Choi and Kim (2015). The core basic nursing skills, transfusion nursing and tracheostomy tube management were selected as the themes to reflect the needs of learners, and the contents for strengthening basic nursing practice competency were modified and applied to the modified 'PARTNER' model.

**Table 1:** Item meaning and composition of critical thinking propensity

Item	Meaning	Question Number
Intellectual passion/curiosity	Intellectual passion/curiosity means being eager to learn, asking questions, and passionately seeking knowledge to find answers to problems.	1*, 2, 3, 4, 5
Prudence	Prudence stands for suspending judgment until a valid and sufficient basis has been obtained and persisting in pursuit of accurate results.	6, 7, 8, 9
Confidence	Confidence stands for confidence in one's own thinking processes and reasoning abilities.	10, 11, 12, 13,
Systematic	Systematic means to explore systematically and sequentially, not stray from the core of the problem being discussed, and maintain logical coherence to conclusions.	14, 15, 16
Intellectual fairness	Intellectual fairness means not distorting facts, not claiming more than we actually know, and acknowledging the truth even if it results in contradiction to one's assumptions and beliefs.	17, 18, 19, 20
Healthy skepticism	Healthy skepticism means having a questioning attitude about generally accepted and socially accepted facts, acknowledging and questioning the potential for error of oneself and others.	21, 22, 23, 24
Objectivity	Objectivity means that conclusions are drawn based on valid grounds, not on emotional or subjective factors.	25*, 26, 27

\*reverse question

The modified 'PARTNER' model was reduced to a practical lecture module and applied as a 'PRTER' model. In class, face-to-face practice conducted as a

team activity is first conducted in the practice room in connection with pre-learning (In-class I). The second class was held online, and as a team activity,

students watched, discussed, and learned videos filmed by their colleagues. The third class was used as a time for individual and group evaluation of learning contents. In post-reflection, self-reflection on learning outcomes was performed.

The specific experimental method is as follows:

- Preparation: For the pre-education, basic nursing video learning filmed by the instructor was completed at least once at home, and additional videos on nursing skills were studied for two weeks. Class participation and completion were checked by the instructor by checking the running time of the LMS, and individual texts were sent to students who lacked learning volume to encourage learning and then reconfirmed the learning volume.
- Relevance: Students who completed the theory and basic learning through video formed a team of four and conducted hands-on practice in the lab. During a total of six hours of practice, four hours of class with the instructor, and two hours of self-practice, the students self-checked through the checklist.
- Team activity: This class was conducted through an online video meeting (ZOOM) for a total of 90 minutes, excluding breaks. In order to increase the learning efficiency, a team activity consisting of four people was performed. By assigning students to small group rooms, individual learning results were integrated, and the presentation materials were completed through discussion and consultation within the team.

- Evaluation: All students presented and evaluated the results of team activities. A structured evaluation table was used for evaluation, and evaluation consisted of individual evaluation and team evaluation.
- Reflection: Self-reflection on learning performance was performed through evaluation and feedback process.

The video to be used in class was prepared by a video taken by fellow students. For the preparation process, the extracurricular program was connected, and it was conducted for a total of 10 hours for students who voluntarily applied to the program. For the video shoot, the following five-step process was performed using the design thinking technique: (1) identifying the problem to be solved among the techniques specified by the theme, (2) finding a multi-faceted solution, (3) designing a step-by-step action plan, (4) program composition for problem-solving, and (5) program application and dissemination. The students came up with the content they were curious about or difficult through discussion, wrote the scenario, and prepared the filming video. In the middle of the video, gamification theory such as fun, interest induction, and goal setting was applied to induce learners' motivation to be strengthened, and a checklist was designed to enhance the learning effect. Fig. 1 shows the flipped-learning class model.

Pre-class	In-class I	In-class II	In-class III	Post-class
<b>Preparation</b>	<b>Relevance</b>	<b>Team Activity</b>	<b>Evaluation</b>	<b>Reflection</b>
LMS learning video learning	Face-to-face learning practice	Online learning video meeting	Individual evaluation team evaluation	Post-reflection
Taken by the instructor learn by Video	Team practice in the lab	Team discussion on a video shot by a colleague	Evaluate with a structured scorecard	Self-reflection on learning outcomes

Fig. 1: Flipped-learning class model

During the entire experimental period, the instructor provided a structured checklist as a coach to help learners set the direction of competency-building by themselves and produce results.

### 2.5. Data analysis

The collected data were analyzed using the SPSS Win version 26.0 program. General characteristics were obtained using descriptive statistical methods such as frequency, percentage, mean, and standard deviation. Comparison of self-directed learning ability Pre-Post Comparison was confirmed by paired t-test. Comparison of Critical Thinking Dispositions Pre-Post Comparison was confirmed by

paired t-test. Core Basic Nursing Skills Performance Pre-Post Comparison was confirmed by paired t-test.

### 3. Results

#### 3.1. General characteristics

The general characteristics of the subjects are learner-related characteristics, and the results are shown in Table 2. The study subjects were 66.7% female and 33.3%, male. Looking at the degree of adaptation to the major, the students with the average degree of adaptation to the major accounted for the most at 55.6%. As for major satisfaction, 72.2% of students reported high satisfaction, and



69.4% of students answered that they were very satisfied with basic nursing practice.

As for the subjective problem-solving ability perceived by the subject, 63.9% of the subjects answered that it was average, and 25% of the subjects answered that it was high.

The average score for subjective self-directed learning was 5.20 (SD=2.17), and the average score for the importance of basic nursing practice was 8.92 (SD=1.11).

**Table 2:** General characteristics

Variables		N	%	Mean±SD
Gender	Male	12	33.3	
	Female	24	66.7	
Adaptability of major	High level	11	30.5	
	Medium level	20	55.6	
	Low level	5	13.9	
Satisfaction with major	High level	26	72.2	
	Medium level	9	25.8	
	Low level	1	2.8	
Satisfaction with fundamental nursing practice	High level	25	69.4	
	Medium level	10	27.8	
	Low level	1	2.8	
Subjective problem-solving ability	High level	9	25.0	
	Medium level	23	63.9	
	Low level	4	11.1	
Subjective degree of self-directed learning				5.20±2.17
Subjective importance of fundamental nursing practice				8.92±1.11

**3.2. Comparison of self-directed learning ability pre-post comparison**

Table 3 shows the comparison results of the subject's self-directed learning ability after the introduction of the flipped-learning method in this study (t=-2.556, p<.05). After four weeks of flip-learning class, the self-directed learning ability score

of the subjects improved significantly from 3.56 to 3.75. In the sub-items, the learning plan score improved significantly from 3.42 to 3.77 (t=-3.849, p<.01) and learning evaluation from 3.54 to 3.73 (t=-2.597, p<.05). There was an increase in the score from 3.53 to 3.64 in learning execution, but it was not significant.

**Table 3:** Comparison of self-directed learning ability

Variables	Pretest	Posttest	t(p)
	M±SD	M±SD	
Self-directed learning ability	3.56±0.50	3.75±0.37	-2.556(.016)
Learning plan	3.42±0.53	3.77±0.48	-3.849(.001)
Learning run	3.53±0.55	3.64±0.36	-1.340(.189)
Learning assessment	3.54±0.59	3.73±0.44	-2.597(.014)

**3.3. Comparison of critical thinking dispositions pre-post comparison**

The pre-post comparison results of critical thinking dispositions after the introduction of the flipped-learning method in this study are as follows in Table 4. The total score of critical thinking disposition also significantly improved from 3.61 (SD=0.42) to 3.78 (SD=0.41) (t=-3.140, p<.01). As for the sub-factors, intellectual curiosity score was from 3.60 to 3.81 points (t=-2.599, p<.05), health skepticism was from 3.58 to 3.92 points (t=-3.689,

p<.01), and systematicity were from 3.24 to 3.71 points (t=-3.991, p<.001), and the self-confidence score improved from 3.51 points to 3.90 points (t=-4.278, p<.001), which was statistically significantly improved. Although not statistically significant, prudence scored from 3.30 points (SD=0.64) to 3.31 points (SD=0.59), intellectual fairness scored from 4.06 points (SD=0.59) to 4.16 points (SD=0.61), and objectivity scored from 3.90 points (SD=0.60) to 4.02 points (SD=0.59).

**Table 4:** Comparison of critical thinking disposition

Variables	Pretest	Posttest	t(p)
	M±SD	M±SD	
Critical thinking disposition	3.62±0.42	3.78±0.41	-3.140(.004)
Intellectual curiosity	3.60±0.54	3.81±0.52	-2.599(.014)
Prudence	3.30±0.64	3.31±0.59	-.127(.900)
Self-confidence	3.51±0.63	3.90±0.57	-4.278(.000)
Systematicity	3.24±0.69	3.71±0.64	-3.991(.000)
Intellectual fairness	4.06±0.59	4.16±0.61	-1.107(.277)
Health skepticism	3.58±0.61	3.92±0.62	-3.689(.001)
Objectivity	3.90±0.60	4.02±0.59	-1.199(.239)

### 3.4. Core basic nursing skills performance pre-post comparison

The pre-post comparison results of the core basic nursing skills performance scores after flipped-learning class in this study are as follows in Table 5. Being with the overall score of core basic nursing skills performance, which means students'

performance in core basic nursing skills, improved significantly from 5.67 to 7.25 ( $t=-8.227, p<.001$ ). In addition, the tracheostomy tube management score was from 5.80 to 7.20 ( $t=-7.359, p<.001$ ), and the transfusion nursing performance score were from 5.85 to 7.20 ( $t=-7.885, p<.001$ ).

**Table 5:** Comparison of core basic nursing skills performance

Variables	Pretest	Posttest	t(p)
	M±SD	M±SD	
Core basic nursing skills performance	5.67±1.68	7.25±1.97	-8.227(.000)
Tracheostomy tube management	5.80±1.72	7.20±1.97	-7.359(.000)
Transfusion nursing	5.85±1.67	7.20±1.97	-7.885(.000)

### 4. Discussion

This study was conducted to analyze the effect of applying the flipped-learning class designed for the purpose of strengthening major competency through fundamental nursing practice education for nursing students. Based on the results of this study, the following discussion can be made.

In this study, being with it was found that the self-directed learning ability of the study subjects improved after the introduction of the flipped-learning method for six weeks. This is similar to the study result of Kim and Kim (2017), who conducted flipped-learning for nursing students, and reported that self-directed learning ability significantly improved after flipped-learning. The learning-based flipped-learning class is thought to be due to the advantage that students can improve their self-directed learning ability in the process of participating in the class. In this study, the learning plan ( $p<01$ ) score among self-directed learning abilities was significantly improved, which is similar to that of the learning plan among the self-directed learning abilities in the previous study (Kim and Kim, 2017).

On the other hand, in the previous study, only an increase in the score was reported for learning execution and learning evaluation, but it was not significant. In this study, to further strengthen the effect of video media, which is known as an effective method for inducing self-directed learning in flipped-learning, a learning video recorded by a teacher was used. In addition, a new research method was additionally introduced to view and debrief not only the instructor's video but also the research video that colleagues voluntarily participated in. This method not only reinforces the learner's learning motivation and participation but also conducts reflection education and evaluation education at the same time while debriefing while watching colleagues' videos together. In this study, it is interpreted that the introduction of such a new research method is related to an increase in the learning evaluation score. It is thought that it is necessary to introduce specific strategies and methods to strengthen the improvement of the learning execution stage when designing a class model later.

Critical thinking dispositions were also significantly improved in this study. This result is similar to the results of Simpson and Richards (2015) that a harmonious balance of online pre-learning and in-class activities can improve critical thinking. The teaching method of flipped-learning designed in this study is a modified 'PRTER' model, and this study systematically designed and applied a hybrid type class consisting of online and offline practical education, online reflection, and evaluation, and these results were derived.

As for the sub-factors, the scores of intellectual curiosity ( $p<.05$ ), health skepticism ( $p<.01$ ), systematicity ( $p<.001$ ), and self-confidence ( $p<.001$ ) significantly improved. Intellectual curiosity is the eagerness to learn, and the passionate pursuit of knowledge by asking questions to find answers to problems (Yoon, 2004). In this study, it is thought that the students' ability to develop their intellectual curiosity increased in the process of solving problems as if they were playing a game by watching the videos that their colleagues had fun shooting. Healthy skepticism is an attitude of questioning generally accepted and socially accepted facts, acknowledging and questioning the potential for error of oneself and others (Yoon, 2004). It is judged that the students strengthened the capabilities of healthy skepticism in the process of answering the questions of the prepared video and finding the errors made, and in the process of presenting the first collected opinions and integrating the results of other groups. Systematicity is to explore systematically and sequentially, not deviate from the core of the problem being discussed, and maintain logical consistency to conclusions (Yoon, 2004). Systematicity competency reinforcement is considered to be the result of training while maintaining logical consistency through the checklist used in the entire course of the class. Self-confidence means that they have confidence in their thinking process and reasoning ability (Yoon, 2004). During the entire learning process, it is expected that students could experience a rise in confidence through the whole process of expanding their knowledge by diluting what they knew and did not know in the first and second discussions.

In this study, it would be necessary to seek a strategy to enhance prudence, intellectual fairness,

and objectivity, which did not show significant improvement although there was a score increase. At this time, it is necessary to consider the results of previous studies (Park and Kim, 2016) that the flipped-learning class does not simply improve the critical thinking disposition of learners, but has different results depending on the class design method. In this study, the overall score of core basic nursing skills performance, which means students' core basic nursing skills performance, was significantly improved after the flipped-learning class ( $p < .001$ ). In addition, the sub-factors, tracheostomy tube management score ( $p < .001$ ) and transfusion nursing performance score ( $p < .001$ ) also significantly improved. Being with as in this study, there was a study (Cha and Kang, 2020) in which confidence in core basic nursing skills and performance significantly improved after applying the flipped-learning method. Contrary to the results of this study, there was a study (Aekyung and Jeong, 2020) in which there was no significant difference in the improvement of confidence and performance in core basic nursing skills. In previous studies, the reason that the effect of the flipped-learning class was not significant was that the number of students participating in the self-practice and the time to participate in the study affected their confidence in core basic nursing skills. In addition, in the case of practical education, it was very important to secure the time for direct practice even when applying flipped-learning, and it was emphasized that it is necessary to organize education so that learners can acquire skills physically based on the theory. In this regard, the reason that the confidence and performance ability of core basic nursing skills improved in this study is judged to be the effect of the hybrid-type flipped-learning class design. That is, in this study, the class design was divided into (1) online video education, (2) offline practical education that strengthens the performance capability of practical education, (3) debriefing reflection through video meetings, and (4) peer evaluation. It is thought that such a hybrid-type teaching model was effective.

Also, unlike previous studies (Aekyung and Jeong, 2020) that conducted a study on vital signs and Foley catheter insertion, which had to be learned directly, in this study, accurate knowledge-based skill acquisition was important for tracheostomy tube management and blood transfusion nursing. It is also noteworthy that the performance ability was confirmed. Therefore, when designing a flipped-learning class model in the future, developing various hybrid class models of theory-centered online learning and skill-centered face-to-face learning is suitable for the 20 core basic nursing skills so that each of the core basic nursing skills can be strengthened.

## 5. Conclusion

Fundamental nursing practice is a practical subject required for nursing students to solve health

problems of subjects in the medical field. The educational content of fundamental nursing practice is to teach core and basic nursing practice skills, which is essential for nurses to acquire important competencies. As such, basic nursing practice education contains important major competencies in nursing, and it is difficult to enhance learners' voluntary participation and learning effect with simple practical classes. So, the practical competency has been strengthened through self-practice outside of class hours. However, the problem has been raised that it is difficult for learners to practice enough because of expensive equipment, limited space for practice compared to the number of students, and only a short time between class and class time are allowed. In particular, after COVID-19, restrictions on face-to-face classes are repeated, and the problem that learners' right to learn is not guaranteed has emerged. Therefore, in this study, a practical training class model was devised so that basic nursing practice education can be stably maintained and the maximum effect can be obtained. The newly proposed practice model is based on the flipped-learning class model as a base of the practice model and applies a hybrid type of class method that combines online and offline learning. The learner did prior learning by watching the instructor's video and participated in the practice directly with the team members in the practice room. In addition, through the video meeting system, colleagues watched videos voluntarily filmed, debriefed, and strengthened their learning capabilities through discussion, presentation, and evaluation. After the class was over, the learning effect was maximized through the time of reflection. In this six-week study, 36 study subjects were able to improve their self-directed learning ability, critical thinking disposition, and core basic nursing skills, which are core competencies in nursing.

The results of this study are meaningful because the flipped-learning teaching and learning model was introduced to the unstable class environment caused by COVID-19, thereby engaging learners as active participants in education and strengthening their practical competency. Through the results of this study, it is thought that nursing students can expect to improve the quality of education by confirming their major competency in basic nursing practice and teachers by checking the educational performance of competency-based basic nursing practice subjects. Ultimately, it is expected that it will improve the basic nursing skills, which is the most practical ability that nurses must-have, so that they can actively solve the health problems of the subject, and furthermore, it is expected to be used to strengthen the practical competency of new nurses.

Based on the above results, the following are suggested. It is necessary to analyze the factors required to acquire each item of core basic nursing skills. By expanding the results of this study, it will be necessary to develop a hybrid class model that analyzes skill characteristics to strengthen the 20

skills and each competency of core nursing skills and to check their effects.

In this study, as a non-face-to-face learning method, real-time learning was conducted through video meetings using video images recorded by instructors and colleagues. It is considered that continuous research on the development of various non-face-to-face practice contents that allows learners to acquire practical skills by body reflecting on the latest technology and improvement of teaching methods using them is necessary.

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## Compliance with ethical standards

## Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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