

An Analysis of the Effects of Blended Learning in a Fundamentals of Nursing Course

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블렌디드 러닝을 적용한 기본간호학 수업의 효과분석

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Abstract The purpose of this study was to examine the effects of blended learning in a fundamentals of nursing course on nursing students' academic stress, learning engagement, and self-directed learning ability. The study was conducted from September 16 to November 8, 2024, with 46 nursing students who participated in six weeks of blended learning classes in a fundamentals of nursing course. Data were analyzed using SPSS/WIN 28.0 with descriptive statistics, paired-sample t-tests, and significance testing. The results indicated statistically significant differences before and after the application of blended learning: academic stress decreased ($t=2.36$, $p=.023$), whereas learning engagement ($t=-2.35$, $p=.023$) and self-directed learning ability ($t=-4.22$, $p<.001$) increased. These findings suggest that blended learning is an effective instructional method for reducing academic stress and enhancing learning engagement and self-directed learning ability among nursing students. The results of this study may provide foundational evidence for nursing faculty when designing instructional strategies that incorporate blended learning, and further research is recommended to apply this approach across various nursing courses and to evaluate its broader effectiveness.

Key Words : Nursing Student, Blended Learning, Academic Stress, Learning Engagement, Self-directed Learning Ability

요약 본 연구의 목적은 기본간호학 수업에서 간호대학생에게 블렌디드 러닝수업방식을 적용한 교육이 학업스트레스, 학습몰입, 자기주도학습에 미치는 영향을 알아보는 것이다. 연구는 2024년 9월 16일부터 11월 8일까지 진행되었고, 간호학과 학생 46명을 대상으로 기본간호학 수업에서 6주 동안 블렌디드 러닝수업을 적용하였다. 자료는 SPSS/WIN 28.0을 사용해 평균, 표준편차, 대응표본 t-검정으로 분석하였다. 간호대학생을 대상으로 블렌디드 러닝수업전후로 학업스트레스($t=2.36$, $p=.023$), 학습몰입($t=-2.35$, $p=.023$), 자기주도적학습능력($t=-4.22$, $p<.001$)이 통계적으로 유의한 차이가 있었다. 블렌디드 러닝수업은 학업스트레스를 줄이고 학습몰입과 자기주도학습능력을 향상하기 위한 효과적인 수업방식이다. 본 연구 결과는 간호학과 교수들이 블렌디드 러닝 수업방식을 활용한 교수학습 전략을 기획할 때 기초자료로 활용될 수 있을 것이며, 블렌디드 러닝수업방식을 다양한 교과목에 활용하고 그 효과를 평가하기 위한 후속 연구를 제안한다.

주제어 : 간호대학생, 블렌디드 러닝, 학업스트레스, 학습몰입, 자기주도학습

1. INTRODUCTION

With the advent of the Fourth Industrial Revolution, one of the most significant changes in education has been the emphasis on learning strategies that encourage learners to actively participate and take initiative in the learning process [1]. In addition, the recent experience of non-face-to-face classes during the COVID-19 pandemic has facilitated the structural redesign of schools and triggered innovations through the integration of educational technologies [2]. Reflecting on the strengths and weaknesses of remote learning during the pandemic, it is widely recognized that the “new normal” in post-COVID education will be characterized by blended learning [3,4].

Blended learning, which combines online and offline instruction, has attracted attention since the mid-2000s as a pedagogical approach that maximizes the strengths of both modalities. In particular, blended learning has been highlighted as an instructional model that preserves the tacit knowledge transfer inherent in face-to-face education, reinforces interaction often lacking in traditional online classes, and further overcomes temporal and spatial constraints to maximize the effectiveness of education [5]. However, prior to the COVID-19 pandemic, its use was limited due to insufficient institutional support for online courses, a negative campus culture toward e-learning, and faculty members’ limited competencies for online instruction [6]. With the widespread adoption of remote learning during the pandemic, both faculty and students became increasingly familiar with online modalities, leading to substantial shifts in perceptions and attitudes. Consequently, in the post-COVID era, online education is expected not merely as a substitute for offline classes but as a universal mode of education, and blended learning is anticipated to expand substantially [7].

Meanwhile, nursing students experience high

levels of academic stress due to the dual tasks of clinical practice and preparing for the national licensure examination [8]. Faculty members thus have a responsibility to identify strategies that can effectively mitigate such stress [9]. Self-directed learning ability, which enables students to take ownership of their learning, has been shown to be closely related to clinical competency [10]. Accordingly, nursing programs need to make continuous efforts to enhance self-directed learning skills throughout the curriculum. Furthermore, learning engagement, which is defined as the optimal learning experience in which students are fully absorbed in tasks and feel satisfaction and enjoyment [11], has been reported to influence not only academic achievement but also clinical competence [12]. Hence, cultivating learning environments that foster engagement is critically important. Nursing education ultimately aims to cultivate nurses who can effectively provide care in diverse clinical situations by integrating professional knowledge with clinical competence [13]. Given that both self-directed learning ability and learning engagement are significantly associated with clinical performance [14,15], instructional strategies that strengthen these dimensions through coursework would serve as highly valuable pedagogical approaches in nursing education.

In the post-COVID era, the effective implementation of blended learning requires the development of practical teaching learning strategies that take into account various factors such as learner characteristics, learning environments, and course content [16].

In particular, the fundamentals of nursing course is the first major subject encountered by nursing students after entering the program. It establishes the theoretical foundation of nursing and serves as a basis for subsequent clinical practice and the performance of core nursing skills. Furthermore, as this course is included as a mandatory subject in the national nursing

licensing examination, students experience a high level of academic pressure from the early stages of their studies. Consequently, lower-year nursing students have been reported to experience relatively high levels of academic stress [8]. Given these circumstances, the fundamentals of nursing course can be considered both the starting point of nursing education and a subject associated with a high level of academic stress. Therefore, it is essential to prioritize the development of teaching learning strategies that enhance learning engagement and strengthen self-directed learning ability, enabling students to achieve effective learning outcomes despite academic demands.

Blended learning, which combines the autonomy of online learning with the interactive nature of face-to-face instruction, has been recognized as an effective pedagogical approach that reduces learners' cognitive load and enhances self-regulation.

Accordingly, in the context of post-pandemic nursing education, it is necessary to systematically apply and evaluate blended learning in the fundamentals of nursing course in order to develop an evidence-based instructional model that can alleviate academic stress and improve learning engagement and self-directed learning ability.

2. Materials and Methods

2.1 Study design

This study adopted a one-group pretest-posttest design to evaluate the effects of blended learning on nursing students' academic stress, self-directed learning ability, and learning engagement.

2.2 Subject of study

Participants were second-year nursing students enrolled in a fundamentals of nursing course at S

University in Gyeonggi Province, South Korea. The study was conducted after obtaining informed consent following a full explanation of the research purpose. Sample size was calculated with reference to a previous study [17] using G*Power 3.19.7 for a one-group t-test. With an effect size of .52, $\alpha = .05$, and power = .95, the minimum required sample was 41. To account for potential attrition, a total of 46 students were recruited, and data from all 46 participants were included in the final analysis without any withdrawals.

2.3 Measures

2.3.1 Academic stress

Academic stress was assessed using a tool developed by Park and Park [18], which consists of a total of 45 items. This tool employs a 6-point Likert scale, where higher scores indicate greater academic stress. At the time of its development, the reliability of the tool showed Cronbach's alpha values ranging from .89 to .91, and in the present study, the Cronbach's alpha value was confirmed to be .96.

2.3.2 Learning engagement

Learning engagement was assessed using a tool developed by Kim et al. [19], which consists of 29 items. This tool is composed of nine subdomains: balance between challenge and skill, clear goals, unambiguous feedback, merging of action and awareness, concentration on task, sense of control, loss of self-consciousness, altered sense of time, and autotelic experience. Items are rated on a 5-point Likert scale, with higher scores indicating a higher level of learning engagement. At the time of development, the reliability of the tool demonstrated Cronbach's alpha values ranging from .65 to .90, and in the present study, the Cronbach's alpha value was .92.

2.3.3 Self-directed learning ability

Self-directed learning ability was measured using a 45-item instrument developed by Lee et al. [20], consisting of eight subdomains: assessment of learning needs, setting learning goals, identifying learning resources, basic self-management, selection of learning strategies, persistence in learning implementation, attribution of effort to outcomes, and reflection. Items were rated on a 5-point Likert scale, with higher scores indicating greater self-directed learning ability. Cronbach's alpha was .93 at the time of development and .86 in the present study.

2.4 Study process

2.4.1 Developing blended learning methods

To implement the blended learning course, the researcher sought advice from an expert group consisting of one professor of education and one professor of nursing. The experts suggested that applying blended learning to the entire course might reduce students' concentration during class. Previous studies have reported varying frequencies of blended learning application, ranging from six to ten sessions [17,21-22], and indicated that the effectiveness was inconsistent depending on the number of applications. Based on the experts' recommendations, blended learning was therefore planned to be applied over six weeks, corresponding to half of the total course [17,22].

Through expert consultation, appropriate topics for the blended learning sessions were selected. The chosen topics included "activity and exercise needs," "rest and sleep," "nutritional needs," "urinary needs," "bowel elimination needs," and "spiritual health and end-of-life care."

2.4.2 Implementation of blended learning sessions

Since none of the participants had prior experience with blended learning and their understanding of the method was limited.

Therefore, during the course orientation, the researcher provided an introduction to blended learning and a detailed explanation of the lecture topics. The course design was planned based on expert advice and previous studies [17,21-22]. In the experimental group, for the sessions where blended learning was applied, the instructor prepared PowerPoint materials and recorded approximately 25-minute video lectures using Microsoft Office, which were uploaded to the university's learning management system (LMS). The participating students were required to complete pre-class learning on the given topic. On the class day, students first attended a one-hour lecture on the topic, followed by 30 minutes of group work in which they created questions related to the topic. Subsequently, each group presented and discussed their questions for 20 minutes, after which the instructor provided feedback and summary comments. This strategy was designed to avoid the monotony of e-learning [23] based on expert consultation, a peer-learning strategy was incorporated, encouraging students collaboration through the question-generation process.

In the control group, traditional face-to-face lectures were conducted for the sessions where blended learning was applied in the experimental group. After the experimental intervention was completed, two additional blended learning sessions were provided to the control group.

2.5 Data collection and statistical analysis

Data were collected from September 16 to November 8, 2024. The recruitment notice provided detailed information about the study purpose and educational content. All data were analyzed using IBM SPSS WIN 28.0. The reliability of the instruments was assessed by calculating Cronbach's alpha coefficients. General characteristics of participants were analyzed with frequencies and percentages. The effects of blended learning on the dependent variables were examined using paired t-tests.

2.6 Ethical concerns

Before conducting the study, the purpose and methods of the study were explained, and only students willing to participate in the study were selected as subjects. It was clearly stated in the questionnaire that the responses would never be used for purposes other than research purposes, and it was fully explained that there would be no coercion or disadvantage even if the participants refused the study or withdrew their participation during the study.

3. Results

3.1 General Characteristics of the Subjects

The mean age of the participants was 21.70 ± 1.17 years, with 7 males (15.2%) and 39 females (84.8%). Key findings on learning satisfaction and campus life satisfaction are presented in Table 1.

<Table 1> General characteristics of the subjects
N=46

Characteristics	Category	n(%), Mean(SD)
Age(years)		21.70±1.17
Gender	Male	7(15.2)
	Female	39(84.8)
Major learning satisfaction	Very satisfied	8(17.4)
	Satisfied	21(45.7)
	Average	15(32.8)
	Dissatisfied	2(4.3)
	Very dissatisfied	-
Campus life satisfaction	Very satisfied	6(13.0)
	Satisfied	20(43.5)
	Average	18(39.1)
	Dissatisfied	2(4.3)
	Very dissatisfied	-

3.2 Academic stress

For nursing students, the mean score of academic stress decreased from 3.21 before the application of the blended learning method to 2.90 after the intervention, showing a statistically significant difference ($t = 2.36, p = .023$) (Table 2).

3.3 Learning engagement

The mean score of learning engagement increased from 2.66 before the application of the blended learning method to 2.90 afterward, and this difference was statistically significant ($t = -2.35, p = .023$) (Table 2).

3.4 Self-directed learning ability

The mean score of self-directed learning ability increased from 3.08 before the application of the blended learning method to 3.37 after the intervention, showing a statistically significant difference ($t = -4.22, p < .001$) (Table 2).

<Table 2> Difference of dependent variables between before and after Blended Learning

N=46

Variables	Pretest	Posttest	t	p
	M±SD	M±SD		
Academic stress	3.21±0.76	2.90±0.64	2.36	.023*
Learning engagement	2.66±0.43	2.90±0.51	-2.35	.023*
Self-directed learning ability	3.08±0.32	3.37±0.34	-4.22	<.001***

*p < .05, **p < .01, ***p < .001.

4. Discussion

This study was conducted to examine the effects of blended learning on nursing students' academic stress, learning engagement, and self-directed learning ability, with the aim of proposing an effective teaching method. Statistically significant differences were observed in academic stress, learning engagement, and self-directed learning ability before and after the application of blended learning.

The significant reduction in academic stress from 3.21 to 2.90 points is consistent with the findings of Park and Jung [24], who reported that blended learning experiences reduced academic stress and showed a negative correlation with self-directed learning ability and learning satisfaction

among nursing students. Similarly, the systematic review by Wang and Raman [25] confirmed that blended learning is more effective than traditional lectures in reducing learners' psychological burden, supporting the present results. These findings suggest that the flexibility of blended learning, which combines online and offline modalities, provides students with autonomy in managing academic demands and thereby contributes to stress reduction. Previous studies [26] have also reported that nursing students experience higher academic stress compared to general college students, reinforcing the implication that blended learning can serve as an effective strategy to mitigate stress in this population.

Learning engagement significantly increased from 2.66 to 2.90 points, which is consistent with the meta-analysis by Li et al. [27], showing that blended learning enhances learner participation and engagement while yielding higher learning satisfaction than traditional lectures. Furthermore, Li et al. [28] reported that blended learning in nursing skills courses significantly improved both skill performance and learning engagement compared to conventional learning methods. These results demonstrate that opportunities for repeated practice through online learning, combined with interactive activities in offline sessions, foster greater immersion in the learning process.

Self-directed learning ability also significantly improved from 3.08 to 3.37 points, aligning with findings from domestic and international studies. Govindan et al. [29] reported that blended learning enhances nursing students' self-directed learning ability, including domains of self-management and self-control. In a domestic study, Kim et al. [30] confirmed that self-directed learning ability among nursing students exposed to blended learning was a significant predictor of academic achievement and satisfaction. Ha et al. [22] also found that blended learning improved both self-directed learning ability and learning satisfaction. Additionally, Wang and Raman [25]

emphasized that blended learning reduces learners' psychological burden and fosters autonomy, further supporting the current results. These effects can be explained by students' ability to repeatedly review online materials at their own pace while increasing motivation to participate in class through interactive online-offline integration. Students made efforts to repeatedly review sections of the pre-recorded video lectures that they found either difficult to understand or particularly important, and this process is considered to have contributed to the enhancement of their self-directed learning ability. However, Park [24] reported no significant improvement in self-directed learning ability, despite gains in critical thinking and self-efficacy, indicating variability across studies. Future replication studies are therefore needed to verify the consistent effects of blended learning on self-directed learning ability. Moreover, as Li et al. [28] suggested, diverse approaches such as recorded video lectures, hybrid on-site and online sessions, remote simulation training, and three-dimensional digital resources (e.g., metaverse, virtual reality) should be integrated into innovative teaching learning strategies, and their effectiveness should be empirically validated.

Importantly, this study focused on the fundamentals of nursing theory course, a lower-year compulsory major subject that is also included in the national nursing licensing examination. This course provides the theoretical foundation for nursing concepts and basic skills while being known for its heavy academic workload and high stress levels among students in the early stages of the program. The finding that blended learning reduced academic stress while improving learning engagement and self-directed learning ability is therefore particularly meaningful. These outcomes indicate that blended learning, by combining learner autonomy with interactive opportunities, effectively alleviates psychological burden and fosters active learning. Thus, this study provides empirical evidence that blended learning can

function as an effective teaching-learning strategy in foundational nursing courses that are both academically demanding and crucial for developing essential nursing competencies.

Taken together, this study confirms that blended learning is an effective instructional approach for reducing academic stress while enhancing learning engagement and self-directed learning ability among nursing students. Shin and Song [16] proposed blended learning as the “new normal” in education for the post-COVID-19 era, emphasizing the importance of learner-centered course design and institutional support tailored to student characteristics and subject content. The present findings support this perspective, suggesting that blended learning can serve as a critical alternative in nursing education by simultaneously reducing academic burden and enhancing autonomy and engagement in increasingly diverse learning environments.

Nevertheless, as this study was conducted with students from a single nursing department and employed a one-group pretest-posttest design without a control group, caution is required when generalizing the results due to potential threats to validity and limited control over extraneous variables.

5. Conclusion

According to the findings, nursing students who participated in classes incorporating blended learning reported reduced academic stress and enhanced learning engagement and self-directed learning ability. Future research should involve repeated studies by modifying blended learning models or diversifying the timing of their application. In addition, qualitative research could be conducted to explore students' experiences with blended learning and to identify the most effective instructional models tailored to specific courses.

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<관심분야>

성인간호, 교수학습, 회복탄력성