

Effects of Online Education on Nursing Students' Learning Motives, Academic Self-Efficacy, and Self-Directed Learning Ability

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Abstract

Considering the characteristics of the COVID-19 RNA virus with many mutations, there is a significant possibility that the online class method will continue for an extended period. This study aims to establish a teaching and learning strategy for online education by identifying its effects on learning motives, academic self-efficacy, and self-directed learning ability of nursing students. The subjects of the study were 202 nursing students who had completed more than one semester of online classes. The data collection period was from November 1 to November 20, 2020. The results of this study are as follows: grade in last semester ($\beta = -.171, p = .001$), confidence in online classes ($\beta = .113, p = .019$), and self-directed learning ability ($\beta = .619, p < .001$) were significant predictors of learning motives, explaining 62.0% of them ($F = 42.826, p < .001$). For academic self-efficacy, satisfaction with home life ($\beta = .157, p = .006$), preference for online classes ($\beta = -.143, p = .017$), and self-directed learning ability ($\beta = .4, p < .001$) were significant predictors, and explained 38.6% of learning motives ($F = 19.028, p < .001$). In self-directed learning ability, satisfaction with the nursing major ($\beta = .136, p = .013$), learning motives ($\beta = .209, p < .001$), and academic self-efficacy ($\beta = .209, p < .001$) were significant predictors, and explained 62.4% of learning motives ($F = 42.641, p < .001$). Therefore, it is necessary to develop a teaching and learning program that maps out strategies to improve learning motives, academic self-efficacy, and self-directed learning methods for nursing students in online classes.

Keywords— online education, nursing students, learning motives, academic self-efficacy, self-directed learning ability

1. Introduction

The outbreak of the COVID-19 pandemic in Korea has changed the previous format of face-to-face classes to the untact educational method [1]. Considering the characteristics of the COVID-19 RNA virus with many mutations, there is a significant possibility that the online class method will continue for an extended period [2]. As a new educational method with the potential to effectively deliver educational information to as many learners as possible across time and space, “online class” was also used concurrently with terms like “e-learning,” “remote education,” “virtual education,” “cyber education,” “online learning,” “remote learning,” “cyber learning,” and “web-based education” [3]. Given that the learning motives of participants in online lectures give them the will to continue their studies, instructors need to grasp the characteristics of learning motives in advance, which can also be promoted by the active role of the instructor [4].

Learning motives are the continuous and regular reactions students acquire through

experiences of learning-related change and the tendency to strive for academic excellence. It is also directly related to the degree of academic achievement [5] and is an important factor in improving learning outcomes. In addition, in an open learning society, people with learning abilities who can gather information and apply knowledge on their own to solve problems are needed [6]. For university students exposed to passive learning, self-directed learning capacity is essential to achieve productive results, such as success in their careers or employment as well as their academic journeys [7].

Learners need to boost their confidence—the belief that they can trust their own learning abilities and perform a task well, expectations—how well they can perform their self-task, and academic self-efficacy—the ability to move defiantly and patiently toward goals rather than avoiding complex tasks or situations [8]. To get them to take interest and responsibility for their learning and to gain a sense of accomplishment and satisfaction during the process [9]. Learners with high academic self-efficacy are more likely to choose challenging tasks [10], make greater efforts than students who doubt their abilities when confronted with challenging situations, and show a higher level of self-directed learning ability due to the characteristic of persevering through tasks for a longer period [11]. There is a need for teaching strategies to improve nursing students' self-directed learning methods and academic self-efficacy [12].

The purpose of this study is to grasp the factors that affect nursing students' learning motives, academic self-efficacy, and self-directed learning ability in online education and to establish effective learning strategies and to strengthen their learning capabilities in the online learning space.

2. Research Methods

2.1 Research Design

This study uses a descriptive approach to grasp the learning motives, academic self-efficacy, and self-directed learning ability of nursing students pursuing online education.

2.2 Participants and Data Collection

The research subjects were 202 nursing students from the Department of Nursing of two universities who had completed more than one semester of online classes. Of the universities one was located in K province and the other in D city of Korea. The data was collected between November 1 and November 20, 2020. As a result of using the G*Power 3.1 analysis program [13], the minimum number of samples calculated by applying significance level of .05, power of .95, and effect size of .15 were 189. A total of 202 data were used for the final analysis, excluding six copies of questionnaires with incomplete responses.

2.3 Research Tools

2.3.1 General Characteristics

The four general characteristics of the subjects were gender, grade, religion, satisfaction with domestic life. Moreover, five other characteristics related to clinical practice were major selection motivation, last semester's school grades, confidence in online learning, prefer online classes.

2.3.2 Learning Motives

For the learning motives research tool, the tools used by Jang Eunhwa[14] that modified and supplemented the tools developed by Kim Yongrae [15] were used. It consists of 19 questions in the sub-areas of non-essential motivation (six items), essential motivation (five items), continuous motivation (two items), and class motivation (six items). In this study, the reliability Cronbach's alpha was .91.

2.3.3 Academic Self-Efficacy

The academic self-efficacy questionnaire developed by Kim Ah-young and Park In-young [16] was used. The lower measure of this questionnaire consists of 3 measures of preference of task challenge, self-regulated efficacy, and confidence, and consists of five Likert measures for 28 question from "strongly agree" to "strongly disagree". The higher the score, the higher the self-efficacy. We chose reverse-scoring method for questions with negative statements. In the study[16], Chronbach's alpha was .85 for preference of task challenge, .82 for self-regulated efficacy, and .87 for confidence. Additionally, Cronbach's alpha was .91, with preference of task challenge of .89, self-regulated efficacy of .88, and confidence of .88.

2.3.4 Self-Directed Learning Ability

For the self-directed learning capacity tool, the self-directed learning capacity scale for university students developed by Lee Seokjae et al. [17] was used. It consists of three sub-areas : learning plan, learning execution, and learning evaluation. There were a total of 40 questions. A higher score represents higher confidence in self-directed learning capacity. In this study, the reliability Cronbach's alpha was .91, and the reliability of each factor was .86 learning plan, .79 learning execution, and .78 learning evaluation.

2.4 Limitation of Research

This study is a randomly convenience extraction for nursing students in some areas, so it would be somewhat difficult to generalize it to all nursing students.

2.5 Data Analysis Methods

The collected data was analyzed using the SPSS 21.0 software. The general characteristics and learning motives of nursing students were analyzed using frequency and percentage. The degree of learning motives, academic self-efficacy, and self-directed learning ability were analyzed with means, standard deviations, Min, and Max.

Differences in learning motives, academic self-efficacy, and self-directed learning ability according to the general characteristics and learning types of nursing students were analyzed using *t*-test, ANOVA, and the Scheffe test. Pearson's correlation coefficient was used to identify the correlation

between learning motives, academic self-efficacy, and self-directed learning ability of nursing students. The effects of learning motives and academic self-efficacy on self-directed learning ability were analyzed using multiple linear regression.

3. Results

3.1 Differences in Learning Motives According to the General Characteristics of Subjects

Table 1 shows the general characteristics of the subjects. There were more female participants (87.1%, N=176). The sample comprised 72(35.6%) second-year students, 74(36.6%) third-year students, and 56(27.75%) fourth-year students. The religion they followed was in the following order: “No religion” (62.9%, No=127), “Christianity” (17.8%, N=36), and “Buddhism” (9.9%, N=20). The response “Satisfied” (65.8%, N=33) was the highest under the characteristic “satisfaction with domestic life.” As far as the satisfaction with nursing major was concerned, the response “Satisfied” (53.5%, N=108) was highest, followed by “Moderate”(43.6%, N=88). The motivation for applying for Nursing Department was in the following order: “High employment rate” (36.6%, N=74) and “Belief in nursing” (32.75, N=66). In the school record of the last semester, the 121 students (59.9%) had “Medium” grades. Moreover, 120 subjects (59.4%) preferred online classes.

Table 1 shows the differences in learning motives according to the general characteristics of the subject.

For learning motives, gender ($p=.023$), satisfaction with nursing major ($p<.001$), major selection motivation ($p<.001$), grades in last semester ($p<.001$), and confidence in online classes ($p<.001$) were significant.

The results of the Scheffe post hoc analysis in this study are as follows: more subjects were “satisfied” than “dissatisfied” under the characteristic “satisfaction with nursing major.” Moreover subjects had higher, “fit aptitude” than “Percentage of employment” under “major selection motivation.” The number of subjects achieving lower grades in the last semester was the lowest, and those achieving medium and top grades were the highest. Subjects showed the highest confidence in online learning, i.e., “confident” was given the highest preference.

Table 1. General Characteristics with Learning Motives

	Categories	N(%)	Learning motives	
			mean±sd	t or F (p)
Gender	Male	26(12.9)	3.20±0.49	2.289 (.023)
	Female	176(87.1)	3.48±0.58	
Grade	2nd	72(35.6)	3.45±0.63	0.979

	3rd	74(36.6)	3.37±0.55	(.377)
	4th	56(27.7)	3.51±0.52	
Religion	Christianity	36(17.8)	3.59±0.52	1.428 (.236)
	Catholic	19(9.4)	3.33±0.63	
	Buddhism	20(9.9)	3.53±0.47	
	None	127(62.9)	3.40±0.59	
Satisfaction with domestic life *	Satisfied ^a	133(65.8)	3.51±0.58	2.753 (.066)
	Moderate ^b	61(30.2)	3.31±0.54	
	Dissatisfied ^c	8(4.0)	3.34±0.52	
Satisfaction of nursing major*	Satisfied ^a	108(53.5)	3.63±0.54	15.675 (.000) (c<b<a)
	Moderate ^b	88(43.6)	3.24±0.52	
	Dissatisfied ^c	6(3.0)	2.91±0.68	
Major selection motivation*	High school record ^a	11(5.4)	3.67±0.52	5.474 (.000) (c<e)
	Others' recommendation ^b	46(22.8)	3.43±0.51	
	Percentage of employment ^c	74(36.6)	3.23±0.57	
	Belief of nursing ^d	66(32.7)	3.62±0.55	
	Fit aptitude ^e	5(2.5)	3.80±0.61	
Last semester's school grades *	Top ^a	42(20.8)	3.83±0.60	24.948 (.000) (c<b<a)
	Medium ^b	121(59.9)	3.44±0.45	
	Lower ^c	39(19.3)	3.02±0.59	
Confidence in online	Confident ^a	52(25.7)	3.80±0.54	17.275

learning*	Normal ^b	10150.0)	3.37±0.51	(.000)
	Not confident ^c	49(24.3)	3.21±0.56	(c,b<a)
Prefer online classes	Prefer	120(59.4)	3.40±0.55	1.124
	Not prefer	82(40.6)	3.50±0.60	(.263)

*Scheffe post hoc analysis

3.2 Differences in Academic self-Efficacy According to the General Characteristics of Subjects

Table 2 shows differences in academic self-efficacy according to the general characteristics of the subject.

For academic self-efficacy, satisfaction with home life ($p=.001$), satisfaction with nursing major ($p<.001$), major selection motivation ($p<.001$), grade in last semester ($p<.001$), and confidence in online classes ($p<.001$), preference for online classes ($p=.049$) were significant.

The results of the Scheffe post-hoc analysis of this study are as follows: In satisfaction with home life, 'satisfaction' was preferred over "dissatisfaction." Moreover, subjects showed more 'satisfaction with nursing major' than "dissatisfaction." In major selection motivation, 'fit aptitude' and 'belief of nursing' were given higher preference than 'percentage of employment." In "grade in last semester," the number of subjects achieving lower grades was the lowest, and those achieving medium and top grades were the highest. In "confidence in online learning," "not confident" received the lowest, and "confident" received the highest preference.

Table 2. General Characteristics with Academic self-Efficiency

Characteristics	Categories	N(%)	Academic self-efficacy	
			mean±sd	t or F (p)
Gender	Male	26(12.9)	2.99±0.42	0.276
	Female	176(87.1)	3.02±0.56	(.783)
Grade	2nd	72(35.6)	3.04±0.59	1.603 (.204)
	3rd	74(36.6)	2.93±0.49	
	4th	56(27.7)	3.10±0.54	
Religion	Christianity	36(17.8)	3.02±0.38	0.894

	Catholic	19(9.4)	2.92±0.37	(.445)
	Buddhism	20(9.9)	3.19±0.91	
	None	127(62.9)	3.00±0.53	
Satisfaction with domestic life*	Satisfied ^a	133(65.8)	3.10±0.53	6.881
	Moderate ^b	61(30.2)	2.90±0.51	(.001)
	Dissatisfied ^c	8(4.0)	2.51±0.72	(c<b<a)
Satisfaction of nursing major*	Satisfied ^a	108(53.5)	3.24±0.47	36.666
	Moderate ^b	88(43.6)	2.82±0.44	(.000)
	Dissatisfied ^c	6(3.0)	1.89±0.74	(c<b<a)
Major selection motivation*	High school record ^a	11(5.4)	3.06±0.54	5.693 (.000) (c<d,e)
	Others' recommendation ^b	46(22.8)	2.97±0.40	
	Percentage of employment ^c	74(36.6)	2.85±0.48	
	Belief of nursing ^d	66(32.7)	3.18±0.63	
	Fit aptitude ^e	5(2.5)	3.71±0.52	
Last semester's school grades*	Top ^a	42(20.8)	3.28±0.48	10.723
	Medium ^b	121(59.9)	3.01±0.51	(.000)
	Lower ^c	39(19.3)	2.75±0.57	(c<b<a)
Confidence in online earning*	Confident ^a	52(25.7)	3.29±0.53	9.761
	Normal ^b	10150.0)	2.96±0.86	(.000)
	Not confident ^c	49(24.3)	2.86±0.63	(c<b<a)
Prefer online	Prefer	120(59.4)	2.95±0.52	1.981

classes	Not prefer	82(40.6)	3.11±0.57	(.049)
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*Scheffe post hoc analysis

3.3 Differences in self-Directed Learning ability According to the General Characteristics of Subjects

Table 3 shows the differences in self-directed learning ability according to the general characteristics of the subject.

For self-directed learning ability, gender ($p=.027$), satisfaction with family life ($p=.005$), satisfaction with nursing major ($p<.001$), major choice motivation ($p<.001$), grade in last semester ($p<.001$) and confidence in online classes ($p<.001$) were shown to be significant.

The results of the Scheffe post-hoc analysis in this study are as follows. In satisfaction with home life, 'satisfaction' was preferred over 'Moderate.' Satisfaction with nursing major' was higher than 'dissatisfaction'. In major selection motivation, 'belief of nursing' was higher than 'percentage of employment'. In "grade in last semester," the number of subjects achieving lower grades was the lowest and those achieving medium and top grades were the highest. Moreover, subjects showed the highest confidence in online learning, i.e., "confident" was given the highest preference over "not confident" and "normal."

Table 3 General Characteristics with Self-Directed Learning Ability

Characteristics	Categories	N(%)	Self-directed learning ability	
			mean±sd	t or F (p)
Gender	Male	26(12.9)	3.26±0.38	2.225 (.027)
	Female	176(87.1)	3.48±0.47	
Grade	2nd	72(35.6)	3.45±0.49	0.638 (.530)
	3rd	74(36.6)	3.42±0.50	
	4th	56(27.7)	3.51±0.39	
Religion	Christianity	36(17.8)	3.61±0.40	1.601 (.190)
	Catholic	19(9.4)	3.44±0.47	
	Buddhism	20(9.9)	3.43±0.50	
	None	127(62.9)	3.42±0.48	
Satisfaction with domestic life*	Satisfied ^a	133(65.8)	3.52±0.48	5.492 (.005) (b<a)
	Moderate ^b	61(30.2)	3.30±0.41	
	Dissatisfied ^c	8(4.0)	3.65±0.31	
Satisfaction of nursing major*	Satisfied ^a	108(53.5)	3.63±0.42	23.399 (.000)
	Moderate ^b	88(43.6)	3.28±0.41	

	Dissatisfied ^c	6(3.0)	2.81±0.62	(c<b<a)
Major selection motivation*	High school record ^a	11(5.4)	3.64±0.34	7.048 (.000) (c<d)
	Others' recommendation ^b	46(22.8)	3.45±0.45	
	Percentage of employment ^c	74(36.6)	3.26±0.47	
	Belief of nursing ^d	66(32.7)	3.61±0.43	
	Fit aptitude ^e	5(2.5)	3.87±0.33	
Last semester's school grades*	Top ^a	42(20.8)	3.68±0.48	14.604 (.000) (c<b<a)
	Medium ^b	121(59.9)	3.47±0.41	
	Lower ^c	39(19.3)	3.15±0.48	
Confidence in online earning*	Confident ^a	52(25.7)	3.68±0.39	9.727 (.000) (c,b<a)
	Normal ^b	10150.0)	3.42±0.46	
	Not confident ^c	49(24.3)	3.30±0.49	
Prefer online classes	Prefer	120(59.4)	3.45±0.44	0.104 (.918)
	Not prefer	82(40.6)	3.46±0.51	
Prefer lecture class	Prefer	176(87.1)	3.47±0.47	-0.994 (.332)
	Not prefer	26(12.9)	3.37±0.43	

*Scheffe post hoc analysis

3.4 Degree of Learning Motives, Academic self-Efficiency, self-Directed Learning Ability

Table 4 shows the degree of learning motives, academic self-efficacy, and self-directed learning ability of subjects. The mean and standard deviation of learning motives was 3.44±0.57. The average scores of each sub-area of learning motives were as follows: 3.46±0.70 for non-essential motivation, 3.67±0.65 for essential motivation, 3.13±0.77 for continuous motivation, and 3.34±0.57 for motivation for teaching. The mean and standard deviation of academic self-efficacy was 3.02±0.54. The following were the average scores of each sub-area of academic self-efficacy: 2.67±0.68 for preference for task difficulty, 3.41±0.60 for self-regulating effect, and 2.96±0.85 for confidence.

The mean and standard deviation of self-directed learning ability was 3.46±0.47. The average scores of each sub-area of self-directed learning ability were as follows: 3.33±0.57 for learning plan, 3.44±0.63 for diagnosis of learning requirements, 3.38±0.80 for goal setting, 3.17±0.72 for exploring resources for learning, 3.56±0.50 for learning execution, 3.62±0.66 for basic self-management ability, 3.47±0.67 for choosing a learning strategy, 3.58±0.63 for attributes of learning execution, 3.49±0.52 for learning evaluation, 3.61±0.53 for efforts for results, and 3.36±0.73 for introspection.

Table 4. Status of Learning Motives, Academic self-Efficiency, self-Directed Learning Ability

Classification	Sub Domains	mean±sd	Max	Min
Learning motives		3.44±0.57	4.95	2.00
	Non-essential motivation	3.46±0.70	5.00	1.67
	Essential motivation	3.67±0.65	5.00	2.20
	Continuous motivation	3.13±0.77	5.00	1.00
	Motivation for teaching	3.34±0.57	4.83	1.83
Academic self-efficiency		3.02±0.54	4.32	1.18
	Preference for task difficulty	2.67±0.68	5.00	1.00
	Self-regulating effect	3.41±0.60	4.70	1.20
	Confidence	2.96±0.85	5.00	1.00
Self-directed learning ability		3.46±0.47	4.60	2.08
	Learning plan	3.33±0.57	4.80	1.40
	Diagnosis of learning requirements	3.44±0.63	5.00	1.00
	Goal setting	3.38±0.80	5.00	1.00
	Exploring resources for learning	3.17±0.72	5.00	1.00
	Learning execution	3.56±0.50	4.80	2.20
	Basic self-management ability	3.62±0.66	5.00	1.60
	Choosing a learning strategy	3.47±0.67	5.00	1.60
	Attributes of learning execution	3.58±0.63	5.00	2.20

	Learning evaluation	3.49±0.52	4.90	1.90
	Efforts for results	3.61±0.53	4.80	2.40
	Introspection	3.36±0.73	5.00	1.00

3.5 Correlations among Learning Motives, Academic self-Efficiency, self-Directed Learning ability of Subjects

Table 5 shows the results of analyzing the correlation among learning motives, learning self-efficacy, and self-directed learning ability of subjects. Learning motives had positive correlations with academic self-efficacy ($r=.508$, $p<.001$) and self-directed learning ability ($r=.761$, $p<.001$), while academic self-efficacy had a positive correlation with self-directed learning ability ($r=.567$, $p<.001$).

Table 5. Correlation with Learning Motives, Academic self-Efficiency, self-Directed Learning Ability

Variables	Learning motives	Academic self-efficiency	Self-directed learning ability
	r(p)	r(p)	r(p)
Learning motives	1	.508 (.000)	.761 (.000)
Academic self-efficiency		1	.567 (.000)
Self-directed learning ability			1

3.6 Factors Influencing the Learning Motives, Academic Self-Efficiency, Self-Directed Learning Ability of Subjects

Table 6 shows the results of analyses of statistically significant ($p<.05$) variables in the general characteristics of subjects and factors affecting learning motives, academic self-efficacy, and self-directed learning ability. Grade in last semester ($\beta=-.171$, $p=.001$), confidence in online classes ($\beta=.113$, $p=.019$), and self-directed learning ability ($\beta=.619$, $p<.001$) were significant predictors with respect to learning motives. They explained 62.0% of the learning motives ($F=42.826$, $p<.001$).

In academic self-efficacy, satisfaction with home life ($\beta=.157$, $p=.006$), preference for online classes ($\beta=-.143$, $p=.017$), and self-directed learning ability ($\beta=.4$, $p<.001$) were significant predictors, and explained 38.6% of the learning motives ($F=19.028$, $p<.001$). In self-directed learning ability, satisfaction with nursing major ($\beta=.136$, $p=.013$), learning motives ($\beta=.209$, $p<.001$), and academic self-efficacy

($\beta=.209$, $p<.001$) were significant predictors, and explained 62.4% of the learning motives ($F=42.641$, $p<.001$).

Table 6. Factor Influencing the Learning Motives, Academic self-Efficiency and self-Directed Learning ability

Variables		B	β	t(p)	R	Adjusted R^2	F(p)
Learning motives	Content	.767		2.817(.005)	.796	.620	47.826 (.000)
	Gender	-.073	.077	-0.941(.348)			
	Satisfaction of nursing major	.012	.011	0.217(.828)			
	Major choice motivation	.015	.024	0.529(.598)			
	Last semester's school grades	-.155	-.171	-3.432(.001)			
	Confidence in online earning	.092	.113	2.367(.019)			
	Academic self-efficiency	.064	.061	1.050(.295)			
	Self-directed learning ability	.756	.619	10.961(.000)			
Academic self-Efficiency	Content	.810		2.413(.017)	.638	.386	19.028 (.000)
	Satisfaction with family life	.153	.157	2.765(.006)			
	Major choice motivation	.053	.090	1.552(.122)			
	Last semester's school grades	-.083	-.096	-1.485(.139)			
	Confidence in online earning	.089	.116	1.795(.074)			
	Prefer online classes	-.160	-.143	-2.397(.017)			

	Learning motives	.049	.052	0.566(.572)			
	Self-directed learning ability	.497	.429	4.993(.000)			
Self-directed learning ability	Content	1.142		5.191(.000)	.799	.624	42.641 (.000)
	Gender	-.060	-.043	-0.958(.339)			
	Satisfaction with family life	-.062	-.074	-1.553(.122)			
	Satisfaction of nursing major	.116	.136	2.495(.013)			
	Major choice motivation	.001	.002	.039(.969)			
	Last semester's school grades	.000	.000	-.006(.995)			
	Confidence in online learning	-.012	-.018	-0.366(.715)			
	Learning motives	.504	.615	10.961(.000)			
	Academic self-efficiency	.180	.209	3.731(.000)			

5. Discussions

This study attempts to identify factors affecting nursing students' learning motives, academic self-efficacy, and self-directed learning ability in online classes. Common significant differences in learning motives, academic self-efficacy, and self-directed learning ability according to general characteristics were found to be in satisfaction with nursing major, major selection motivation, grade in last semester, and confidence in online classes. Therefore, it is necessary to consider these variables when developing programs for online learning.

Grades in the last semester, confidence in online classes, and self-directed learning ability were found to be significant predictors of nursing students' motivation in online classes. Lee Nae-yeong and Han Ji-young [18], in a survey, found that learning motives and class participation in flip classes have more effect on class satisfaction than in traditional lecture method classes. Flip classes enable individualized constructive learning through student activities. Future studies should investigate the impact of learning motives on class satisfaction in online classes. Additionally, Kim Mi-eun and Kim Min-

jung [19] found learning motives to be a factor that influences online class satisfaction. Therefore, effective online education can be achieved if the learning motive is enhanced by considering ways to revitalize students' individualized participation in online education.

Among nursing students pursuing online education, the satisfaction with domestic life, preference for online classes, and self-directed learning ability were found to be significant predictors of academic self-efficacy. In the study, Kim Mi-young and Byun Eun-kyung [20] showed that satisfaction with nursing major and academic self-efficacy are factors that affect problem-solving skills. Extension of this study is needed to check the distinction between offline and online classes in the future.

Satisfaction with nursing major, learning motives, and academic self-efficacy were found to be significant predictors of the self-directed learning ability of nursing students pursuing in online classes. The study by [21], showed that confidence and learning attitude for academic achievement were influential variables explaining self-directed learning ability. I.K. Kim [22] showed that a significant predictor of self-directed learning ability was learning attitude, which showed results different from the results of this study.

The study[12] showed that problem-solving skills and learning motives improve after PBL classes; however, they do not affect self-directed learning ability.

Self-directed learning ability is influenced by various characteristics or types of learning abilities of students [23]. Therefore, a study to identify the relationship or appropriate reflection of various variables is required after identifying the characteristics or learning abilities of subjects.

As the results of this study were obtained randomly for nursing college students in select areas, it is slightly difficult to generalize the results for all the nursing college students. Future studies should be conducted with expanded study variables and subjects. Based on the above results, it is necessary to find a more stable educational strategy by studying and understanding various educational approaches to increase learning motives and self-directed learning ability in online classes.

After analyzing the correlation between the subjects' learning motives, learning self-efficacy, and self-directed learning ability, we found that learning motives have a positive correlation with academic self-efficacy and self-directed learning ability. It can be seen that the higher the academic self-efficacy and self-directed learning ability, the higher the learning motives. As academic self-efficacy has a positive correlation with self-directed learning ability, measures are needed to increase self-efficacy.

It is necessary to develop a teaching and learning program that maps out strategies to improve learning motives, academic self-efficacy, and self-directed learning methods for nursing students pursuing online education.

6. Conclusions & Suggestions

This study was attempted to anticipate the qualitative effects of online education of nursing Students and present a desirable educational strategy by understanding the unselectable educational environment between teachers and learners due to the prolonged Covid-19 situation.

The results of this study are as follows: grade in last semester, confidence in online classes, and self-directed learning ability were significant predictors of learning motives, explaining 62.0% of them. For academic self-efficacy, satisfaction with home life, preference for online classes, and self-directed learning ability were significant predictors, and explained 38.6% of learning motives. In self-directed learning ability, satisfaction with the nursing major, learning motives, and academic self-efficacy were significant predictors, and explained 62.4% of learning motives.

In order to improve the systematic teaching and learning ability of nursing students after applying for online classes, it is necessary to develop the contents of educational programs, including developing a teaching and learning program to draft strategies to increase learning motives, academic self-efficacy and self-directed learning methods in online classes.

It is considered that cooperative systems must be established continuously by developing a cooperative management program between the nursing department and the hospital[24]. Based on this study, it is necessary to opt for online education that can improve communication skills of nursing college students.

In addition, the results establish that nursing students need to pre-evaluate learners' motivation to learn through online classes and design and operate instruction to improve online class satisfaction. Due to the prolonged COVID-19 crisis, all classes are required regardless of the preference of the learners and instructors. These classes are now being converted into online classes.

This study is currently being expanded and operated, and it is expected that online lectures will be re-recognized to rectify the problems and improve the satisfaction level of nursing students' self-directed learning and communication ability.

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