

The influence of internet-use Anatomy class on critical thinking disposition - Flipped learning method applying-

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Abstract

The purpose of this study was to examine the effects of internet-use Anatomy class, as one of the Flipped learning method, on critical thinking disposition. The class for this study was conducted from March 1 to April 10, 2018. The study involved a total of 180 people in the first year of a University located in C province. Data collection was carried out before and after the Flipped learning method application. Frequency analysis, Paired t-test, Pearson correlation, and Regression analysis were used for the analysis. According to the analysis, 28.3% of men and 71.1% of women and before applying the program analysis of correlation between Flipped learning perception and critical thinking disposition showed a significant correlation between confidence(sub-component of critical thinking) only ($p < .005$). Comparing the scores of critical thinking before and after the program, it was found that Truth seeking ($p < .001$), Open-mindedness ($p < .005$), Confidence ($p < .001$), Systematicity ($p < .005$), Analyticity ($p < .001$), and Inquisitiveness ($p < .001$) scores had increased significantly except Maturity ($p > .005$). And the regression analysis of Flipped learning method applying influence on critical thinking disposition were significantly affected ($p < .001$). Based on the results of this study, it was possible to determine that Flipped learning method had a positive effect on critical thinking disposition.

Keywords: Critical thinking disposition, Internet-use Anatomy class, Flipped learning.

1. Introduction

Flipped learning method is a class where students study the contents of a class online first, and then taught to be called a backward class [1-2].

Flipped learning method are professor's way of learning that allows more classroom time for interaction with students than for instruction to maximize learning in class by using information technologies as a form of blended-study learning [3]. In other words, Flipped learning is a combination of offline lectures, which was made popular by American educator in the late 2000s. General content will be solved online and the real class will have a lot of interaction time with the students through student-oriented discussion [4].

The advantage of Flipped learning is that it allows students to adjust their level of progress on their own

[5].

While watching the video, they can repeat the lesson, record the questions, ask the teacher during the class, or make friends with other students. Also Flipped learning offers an opportunity to enhance the skills of learning in the classroom while working with colleagues to resolve the project. It gives each other the opportunity to learn teaching and learning with confidence. Furthermore, teachers can enhance the students' interaction and develop these abilities by improving the areas they lack. And Flipped learning allows students to fill in their missing parts of the study by providing online classes to those who were unable to attend classes due to sickness or urgent work. However, care must be taken as this flexibility can be a drawback in some cases. These classes also make it possible for parents to gain access to parents at home to check their children's learning skills. By applying flipped learning to match the situation, students can have the results they need to have more time to experience the efficiency of their time. Despite these many advantages, there is a problem that requires an internet environment that has access to online contents. Nursing is a study of the theory and practice of nursing [6]. Nursing is the act of maintain and improving health, including helping to prevent or recover from disease. Nursing science targeting humans is a combination of various disciplines, including medicine, that include multidisciplinary research [7]. Therefore, nursing education is very broad and covers a wide range of topics. Because of the wide range of learning, sometimes the nursing students make it difficult to learn or to keep understanding what they do not fully understand in class. Most of nursing students complain that their college life is harder than any other department [8]. In order to compensate for these problems, the nursing profession started to produce video clips of the nursing practice and use it in each school. However, this is not a video clip made by a real class professor, so it has some variation in the consistency of the class. In comparison, flipped learning is made by a professor who is in class making videos. Therefore, it is suitable for the consistency of the class and for the proper answers to the students' questions. Learning from the pre-learning video will also help nursing students to ease the idea of college life problems if they have enough time to learn at their own pace [9].

Recently, nursing techniques have changed rapidly due to the rapid development of science. With the knowledge and ideas that the professor of nursing learned in the past, one-way teaching could lead to a reversal of rapid academic changes. Nursing science, unlike medicine, makes up a large part of the emotional problems of the clients, so interaction and discussion with people are very important. Discussion should be logical and reasonable. Accordingly, the field of nursing has stressed critical thinking for a long time [10].

Because Nurses can express their abilities through critical thinking at the clinical field [11]. Critical thinking disposition is to think rationally. Critical thinking would be explained as a technical process from experience, observation, communication in the nursing field. In 1994, Facione divided his research into 7 categories the critical thinking disposition [12]. The seven subcomponents of the critical thinking disposition are truth-seeking, open-mindedness, analyticity, systematicity, critical thinking self-confidence, inquisitiveness, and maturity. The truth-seeking can be construed as a passion for obtaining the truth of learning. Open-mind is a non-biased attitude. Analyticity is the ability to see things objectively. Systematicity is the ability to open and link events. Self-confidence means believing in own abilities and making progress effectively. Inquisitiveness means intellectual passion. Maturity means maintaining objectivity in dealing with a case. As a result of the nature of the nursing profession, this implicit critical thinking disposition has been studied in various ways in the Korea nursing community. Critical thinking disposition requires a lot of time to think for oneself. Self-learning is more effective than classroom learning in this kind of thing.

Having discussions through flipped learning is highly suited to these characteristics. By using flipped learning method, a professor of nursing can train each student's mutual discussion naturally and learn the level of students. According to [13] flipped learning method was educational strategy gaining popularity in research. And also they emphasized that the flipped learning method may successfully improve learning outcomes.

Prepared learning can not only cause an interest in learning, but also lead to advanced learning. Anatomy

is the basic subject of nursing, and it is one of the subjects that many nursing students have to memorize and that makes them feel difficult [14]. According to [15] biomedical, humanist, and social justice-oriented critical thinking were constituted by critical thinking. As medical like department require critical thinking ability, it us effective to provide materials that can learn on their own before learning. So, medical science makes video of anatomical practice and provides it to the medical students on these idea. In fact, it is very ineffective for a professor to be responsible for all of the anatomy required to memorize during class. It is very necessary to explain the structure of the incorporation in video clip so that the learners can memorize it at their own paces [16]. Garwood JK1 et al., [17] suggested that the use of concept maps in the study improves critical thinking when applying theory to practice or providing nursing education as a tool to evaluate critical thinking. Therefore, as a tool to evaluate the effectiveness of educational methods, critical thinking can be a proper criterion. Flipped learning method were a very effective way of teaching, as seen in the literature above. So far, however, not many studies have been conducted on the flipped learning method of the Anatomy subject in Korea. Accordingly, this study tried to analyze the effects of flipped learning by applying it to the subject of Anatomy. This research would be used as a basis for the method of Anatomy teaching in the future. The specific purpose of this study is as follows.

First, investigate the preferences of the flipped learning method.

Second, analyze the relationship between critical thinking disposition and the perception of the flipped learning perception.

Third, investigate the difference between critical thinking disposition before and after applying flipped learning method.

Fourth, analyze the influence of flipped learning method on critical thinking disposition in the Anatomy subject.

2. Research Method

2.1 Research Design

The purpose of this study was to analyze the effects of internet-use Anatomy class, as one of Flipped learning method, on critical thinking disposition.

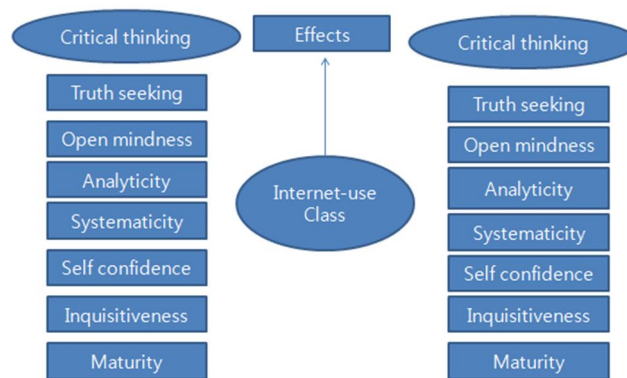


Figure 1. The effect of internet-use Anatomy class on critical thinking disposition

2.2 Data analysis

The following statistical methods were used to analyze this research data. Cronbach's alpha of critical thinking disposition for this analysis was .067. First, Frequency analysis was used for the demographic characteristics. Pearson's correlation was used to analysis to examine the relation between critical thinking

disposition and flipped learning perception. Paired t-test was used to investigate the effects of pre-post internet-use class. Regression analysis was used to analysis the effect of internet-use class on critical thinking disposition.

2.3. Data collection

The data of this study were collected from students who participated in the first year of a university located in C province from March 1 2018 to April 10. Data collection was carried out before and after internet-use (Flipped learning method) application.

3. Results

3.1. General characteristics

The characteristics of the study participants were as given Table 1. The proportion of men to women was 59(28.3%) for men and 139(71.7%) for women. There were 173(96.1%) people aged, 6(3.3%) people aged 20, and 1(0.6%) person aged 21. There were 123(68.3%) people living in dormitory, 39(21.7%) commuting from their house, 9(5.0%) living alone, and 9(5.0%) lodging. The participants had 59 protestant, 10 Catholics and 110 non-religious people. The largest number of people who do not join the club was 115(63.9%) people, 42(3.3%) people joined more than three, 15(8.3%) people joined one club, and 8(4.4%) people joined two club. 156(86.7%) people were satisfied with their major and 24(13.3%) were dissatisfied. 106(58.9%) people liked the flipped learning method very much, 32(17.8%) people liked, 20(11.1%) people who hated it, and 22(12.2%) people who hated it very much.

Table 1. General characteristics

Variable	Type	N(%)
Gender	Male	51(28.3)
	Female	129(71.7)
Age	19	173(96.1)
	20	6(3.3)
	21	1(0.6)
Residence	Dormitory	123(68.3)
	Commute	39(21.7)
	Live alone	9(5.0)
	Lodging	9(5.0)
Religion	Protestant	59(32.8)
	Catholic	10(5.6)
	None	111(61.7)
Club activities	Join 1	15(8.3)
	join 2	8(4.4)
	Above 3	42(23.3)
	None	115(63.9)
Major satisfaction	Yes	156(86.7)
	No	24(13.3)
Flipped learning Preference	Very like	106(58.9)
	Like	32(17.8)
	Hate	20(11.1)
	Very hate	22(12.2)

3.2 The correlation Critical thinking disposition and flipped learning perception

Before applying flipped learning method, Pearson's correlation was analyzed between the perception of flipped learning and critical thinking disposition (Table 2). The analysis showed that there was a significant correlation between flipped learning method perception and self-confidence ($p < 0.05$).

Table 2. The correlation Critical thinking disposition and flipped learning perception

	1	2	3	4	5	6	7	8
1.Flipped learning preference	1	.127	.100	-.159*	-.122	-.027	.012	.145
2.Truth seeking		1	.245**	.047	.039	.196**	.190*	.069
3.Open-mindedness			1	.039	-.138	.434**	.249**	.262**
4.Confidence				1	.493**	.101	-.022	.112
5.Systematicity					1	.230**	-.008	.145
6.Analyticity						1	.423**	.176*
7.Inquisitiveness							1	.221
8.Maturity								1

** , The correlation is significant at the level 0.01(both sides).

* , The correlation is significant at the level 0.05(both sides).

3.3 Pre-post comparison of Critical thinking disposition

Paired t-test was performed to investigate the difference in critical thinking disposition before and after applying Flipped learning. Table 3 showed the average of critical thinking disposition before and after applying flipped learning method. The analysis appeared that the average of Truth seeking ($p < .001$), Open-mindedness ($p < .005$), Confidence ($p < .001$), Systematicity ($p < .005$), Analyticity ($p < .001$), and Inquisitiveness ($p < .001$) were increased, but there was no difference in the Maturity ($p > .005$).

Table 3. Pre-post comparison of Critical thinking disposition

Variable	Mean(SD)		t	P
	Pre	Post		
Truth seeking	3.73(.872)	3.92(.771)	-6.335	.000**
Open-mindedness	3.45(.713)	3.48(.686)	-3.074	.002*
Confidence	3.14(.626)	3.35(.417)	-6.919	.000**
Systematicity	3.18(.639)	3.19(.628)	-2.238	.024*
Analyticity	3.31(.555)	3.77(.455)	-11.868	.000**
Inquisitiveness	3.58(.662)	3.67(.565)	-3.936	.000
Maturity	3.42(.579)	3.42(.575)	-.906	.366

3.4 The influence of Flipped learning method on critical thinking disposition

Simple regression analysis was performed to investigate how the Flipped learning method affect critical

thinking disposition. Table 4 showed the influence of Flipped learning on critical thinking disposition. The analysis appeared that the sub-component of critical thinking disposition (truth-seeking, open-mindedness, Confidence, Systematicity, Analyticity, Inquisitiveness, Maturity) were all significantly affected ($p < .001$).

Table 4. The influence of Flipped learning method on Critical thinking disposition

Independent Variable	Dependent variables	Non-Standardized factor		β	T	P	Statistics
		B	SD				
Flipped Learning Method Applying	Constant	.967	.114	-	8.513	.000	R=.890, R ² =.800,
	Truth seeking	.790	.040	.894	26.661	.000**	Modified R ² =.799, F=710.784, p=.000.
	Constant	.249	.055	-	4.519	.000	R=.976, R ² =.954,
	Open-mindedness	.938	.016	.976	59.913	.000**	Modified R ² =.952, F=3589.579, p=.000.
	Constant	1.749	.103	-	17.043	.000	R=.766, R ² =.586,
	Confidence	.509	.032	.766	15.876	.000**	Modified R ² =.584, F=252.050, p=.000.
	Constant	.097	.033	-	2.905	.004	R=.990, R ² =.980,
	Systematicity	.974	.010	.990	94.377	.000**	Modified R ² =.980, F=8906.993, p=.000.
	Constant	2.475	.181	-	13.657	.000	R=.478, R ² =.228,
	Analyticity	.392	.054	.478	7.257	.000**	Modified R ² =.224, F=52.658, p=.000.
	Constant	.988	.111	-	8.865	.000	R=.878, R ² =.771,
	Inquisitiveness	.750	.031	.878	24.464	.000**	Modified R ² =.769, F=598.505, p=.000.
Constant	.030	.012	-	2.405	.017	R=.999, R ² =.998,	
Maturity	.992	.004	.999	275.315	.000**	Modified R ² =.998, F=75798.334, p=.000.	

*, $p < 0.05$, **, $p < 0.01$

4. Conclusion

The purpose of this study was to examine the effects of internet-use class ultimately. The internet-use class was one of Flipped learning method device. The effect was checked by critical thinking disposition, which was variously studied in the nursing field recently. This study's participants were first year students in the one of local universities and 180 people total. Research was conducted from March 1 to April 10, 2018. For this study, there were 2 times structured questionnaire collected to investigate the pre-post program effects. The reason why collected dependent variable of the critical thinking disposition was various studied it nursing field as important investigated tool of nursing education. And also it contained appropriate contents of education investigate tool, such as truth-seeking, open-mindedness, confidence, systematicity, analyticity, inquisitiveness, and maturity which was developed by Facione, 1994.

As a result, the correlation critical thinking disposition and flipped learning perception appeared significant ($p < 0.05$). It was analyzed by Pearson's correlation method before applying flipped learning

method. This means that the students who were perceived the flipped learning's necessary have the better critical thinking disposition than people not so. Like this difference indicated that it was efficiently tool of effect of pre-post education. Accordingly this result, critical thinking disposition was checked before and after applying of flipped learning. The analysis appeared that the average of Truth seeking ($p < .001$), Open-mindedness ($p < .005$), Confidence ($p < .001$), Systematicity ($p < .005$), Analyticity ($p < .001$), and Inquisitiveness ($p < .001$) were increased, but there was no difference in the Maturity ($p > .005$). These results were very interested, because post critical thinking disposition sub-components score were increased except for maturity. Regard to Facione, maturity means objectivity. In the nature of the flipped learning, it was a way to require self study. Flipped learning method was appeared in the truth-seeking, open-mind, confidence, systematicity, analyticity, and inquisitiveness but it was not effect in maturity. Which means it is necessary complement in the class teaching through professor. Most of nursing professor has fluent field experience and academic knowledge. This is one of Flipped learning method's weak point of view. Flipped learning was very effective in broad part as in [18]. But if there is not presence of competent professor, it may be useless teaching method.

Based on the above results, internet-use flipped learning method was effective in the department of Anatomy class as in [19] study but it should be complement teaching in the off-line class by competent professor.

This study suggests that the use of more many subject of nursing in the school. According to this research for better teaching method.

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