

# Video-aided and Traditional Learning Method: A Comparison Regarding Students' Knowledge Retention

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## Abstract

**Objectives:** This study was conducted to determine effects of surgical operation videos on self-directed learning ability and develop self-learning of public health students. **Methods/Statistical Analysis:** This study was conducted using subjects who enrolled in a basic medicine course as sophomore students at G College from April to June, 2016. The research was designed to use nonequivalent control group in pre-and post-test. Criteria for data collection were self-directed learning ability, learning motivation, professional self-concept, and satisfactory level. Collected data was analyzed using SPSS Program 18.0. Statistical significance was evaluated with frequency, percentage,  $\chi^2$ -test and  $t$ -test. **Findings:** The basic curriculum has been regarded so difficult to public health students that they just put them aside for memorization later. Self-directed learning was significantly higher in a test group than control group ( $t=5.174$ ,  $p>.001$ ). But professional self-concept had no significant difference between two groups ( $t=-.603$ ,  $p=.548$ ). Learning motive had no significant difference between two groups ( $t=1.551$ ,  $p=.125$ ). Satisfaction level showed a higher average score of 4.41. In particular, for those prejudiced students against the basic curriculum, considered to be strict and difficult to follow, videos could help to draw attention and concentration on their class. Meanwhile, in our study, several approaches were attempted to encourage learners to develop self-learning with opening videos after face-to-face education but no significance was made. Because professional self-concept means realization of self-tasks as professionals, self-esteem would be higher when students are confident. Our study suggests that face-to-face class using videos improved self-directed learning and helped students to study their subjects. But disadvantages of our program were inaccuracy of study materials and not quite well fitted levels. **Improvements/Applications:** Clinical practice-related videos could intrigue students' interests and help studying basic major subjects, such as anatomy and physiology. But, knowledge and practical experiences in anatomy and pathology are required for students to be properly taught with video-assisted education.

**Keywords:** Knowledge Retention, Learning Motive, Professional Self-concept, Satisfaction Level, Self-directed Learning Ability

## 1. Introduction

Recently, several ways of class formation including e-learning, r-learning, and flipped learning have been suggested to increase efficiency and to compensate for disadvantages of face-to-face education<sup>1,2</sup>. Differences of prerequisite or flipped learning in class formation arise from when to open videos or training materials before or after learning and when to start class. Prerequisites for aforementioned learning methods have to be web-based

and learners should have to be self-motivated enough to learn independently<sup>2</sup>. They require students to be passionate for learning and to be possessed of self-driven learning competency.

The effectiveness of such class formations has been already proven. But, acknowledging that they could provide students with no limitations for space and relearning to assist their study<sup>3</sup>, studying at home by themselves or independently is taken as another learning challenge. Also, while students feel burdens and lost their

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appetites when confronted with upper levels of supplied videos and training materials than they could sift through. In opposite cases where lower levels were presented, they could lose their expectations for learning enrichment and passion for learning<sup>2</sup>. To achieve educational goals, choice of learning material levels and effective presentation skills have to be considered and their uses must be given in a defined time.

Despite of temporal and spatial limitations, classical face-to-face education has advantages in that real-time communications and emotional exchanges between learners and educators are possible, and learners' requests can be instantly reflected<sup>4</sup>. Nonetheless, students could reach their own educational goals with the help of educators without regard to videos or training materials. Therefore, strategic developments of making face-to-face education effective, and making self-driven learning possible, are necessary.

Basic public health curriculum that helps to be acquainted with positions, structure and functions of internal organs and helps to know the cooperation of each organ and its effects is very important<sup>5</sup>. It is also regarded as an introductory and mandatory course that are strengthen commitments to their jobs as a practitioner who put highest values on life of human beings<sup>6,7</sup>. However students have a tendency of thinking of it as totally complicated difficulties demanding high level of understanding, overwork loads and integrating skills. Due to such burdens and difficulties they are confronted with, they tend to turn away. As they have difficulties in understanding the basic curriculum and in achieving their tasks, they consider it as simple subjects requiring memorizing skills or rather, hard subjects to understand<sup>8</sup>. The ideal way to learn human anatomy is to apply five senses to identify characteristics and systemic differences of each organ practically<sup>9</sup>.

Our studies might help students to increase not only interests in learning but also interests in patients who need to be taken care of and in therapeutic outcomes if videos are used during face-to-face class, showing on video clinical practices, surgical operations or clinical treatments related to the basic curriculum. Firm conceptual establishment on their profession and self-driven learning competency would be expected to come out through educational video uses. Videos of patients, operations and therapies could enable public health students to develop self-driven learning and professional concepts. Our studies attempt to evaluate educational satisfaction

levels and help to promote developments of learning basic curriculum.

## 2. Methods

### 2.1 Research Subjects and Data Collection

This study was conducted using subjects who enrolled in a basic medicine course as sophomore students at G college from April to June, 2016. Test group was initially 55 but 40 at final because of insufficient data or nonattendance or other reasons, and control group was 50 initially but 44 at final because of the same reason. Self-driven learning ability, professional mind, learning motive as indications of learning effects were analyzed and satisfactory levels were evaluated.

### 2.2 Measurement Tools

#### 2.2.1 Self-directed Learning Ability

The term, self-directed learning ability in our study refers to one's ability to learn in their own control by oneself without any assistance from others. This tool was modified and supplemented from<sup>10</sup> who adopted self-directed learning reading scale in<sup>11</sup>. It had 32 questions scored with Likert-style 5-point to each, giving 5 points to "strongly agree" and 1 point to "strongly disagree". At the time of this tool development, confidence was Cronbach's  $\alpha = .90$  but it was Cronbach's  $\alpha = .783$  in this study.

#### 2.2.2 Learning Motivation

Learning motivation refers to willingness to continue study despite circumstances occurring in class and is used to measure post-class learning motive. This tool was modified and supplemented from<sup>12</sup> who adopted Instructional Materials Motivation Scale (IMMS), in<sup>13</sup>. It had 34 questions scored with Likert-style 5-point to each, showing higher points meant higher learning motive. Confidence was Cronbach's  $\alpha = .95$  in the study of<sup>13</sup> but it was Cronbach's  $\alpha = .785$  in this study.

#### 2.2.3 Professional Self-concept

Professional self-concept refers to perception and realization of self as a professional, and views on their work<sup>14</sup>. This stud used the translated version in<sup>15</sup> of Professional Self-Concept of Nurses Instrument: PSCNI) devel-

oped by<sup>14</sup>. It consisted of 27 questions. Each question was scored from 1 (the lowest) to 4 (the highest), and marking higher points meant higher professional mind. Confidence was Cronbach's  $\alpha = .85$  in the study of in<sup>15</sup>, but it was Cronbach's  $\alpha = .895$  in our study.

### 2.2.4 Satisfaction Level on Learning

It was developed by<sup>16</sup>, and modified and supplemented by us including one professor in introductory medicine. It consisted of 11 questions.

## 2.3 Data Analysis

Our study was to obtain post-learning and pre-learning data using non homogenous control group to identify effects of videos as education material on self-driven learning, learning motive and professional mind as an attempt to increase effectiveness of classical face-to-face education. Collected data was analyzed using SPSS Program 18.0. Statistical significance on general characteristics was evaluated with frequency, percentage,  $\chi^2$ -test and t-test. For verification of homogeneity and post-learning, t-test was used.

## 3. Results

### 3.1 General Characteristics of Subjects

Average age of subjects was  $20.68 \pm 2.03$  (test group) and  $21.20 \pm 2.40$  (control group). In answering the degree

of their knowledge in anatomy, the test and control groups (32.5%, 56.7%, respectively) remarked "poor", and 65.0% (test group) and 56.9% (control) showed "competent". Forty % of subjects tested wished to be more taught even though anatomy class had gone half way through, showing that anatomy class was difficult subject.

In terms of self-directed learning ability, answering "able" consist of 25.0%(test group) and 18.2%(control group), and answering "unable" was 75.0%(test group) and 81.8%(control group). This result showed that most had low self-driven learning ability. Both groups were homogenous, as shown in Table 1.

### 3.2 Subject Homogeneity

Because both groups showed no statistically significant difference in self-directed learning ability and professional self-concept, they were identified as homogenous, as shown in Table 2.

### 3.3 Post-test Verification of Variables

Self-directed learning ability of test group was 93, 13.71 higher than pre-test, indicating that our program was helpful to improve self-directed learning ability ( $t=5.174$ ,  $p>.001$ ), as shown in Table 3.

However, learning motivation was no difference between the test and control groups, and statistically not significant ( $t=1.551$ ,  $p=.125$ ). Professional self-concept showed no significant difference in post-test ( $t=-686$ ,  $p=.495$ ). But, both groups had higher average of post-test

**Table 1.** General characteristic factors

Characteristics	Category	Exp.(n=40) n (%)	Con.(n=44) M□D or n (%)	t or $\chi^2$	p
Age		20.68±2.03	21.20±2.40	-1.084	.281
Sex	Male	2(5.0)	6(13.6)	1.814	.268
	Female	38(95.0)	38(86.4)		
Enrollment	Right after high school	36(90.0)	41(93.2)	.598	.704
	Enrolled a while after graduation	4(10.0)	3(6.8)		
The degree of knowledge in anatomy by self-evaluation	Poor	13(32.5)	17(38.6)	.694	.708
	Competent	26(65.0)	25(56.9)		
	I do not know	1(2.5)	2(4.5)		
Self-directed learning ability	able	10(25.0)	8(18.2)	4.106	.250
	unable	30(75.0)	36(81.8)		

than pre-test, meaning that as the basic curriculum progressed, professional self-concept became mature.

**Table 2.** Homogeneity test

Variables	Exp.(n=52)		Con.(n=48)		t	P
	M	D	M	D		
Self-directed learning	79.39±16.29		80.63±13.16		-399	.691
Professional self-concept	63.95±16.85		65.93±13.17		-.603	.548

**Table 3.** Post test

Variables	Exp.(n=52)		Con.(n=48)		t	P
	M	D	M	D		
Self-directed learning	93.09±8.22		80.48±11.98		5.174	>.001
Learning motivation	92.80±8.34		90.00±9.27		1.551	.125
Professional self-concept	72.47±6.23		73.40±5.69		-686	.495

### 3.4 Satisfactory Level

Satisfactory level was high, averaged 4.12 points. In particular, "I've got an interest in anatomy through video-assisted class" was 4.34 points, as shown in Table 4.

**Table 4.** Satisfaction of education

	Question	M(SD)
1.	The training was helpful to obtain relevant knowledge in anatomy	4.39(±0.75)
2.	The training was helpful to obtain relevant knowledge in physiology	4.16(±0.92)
3.	This program would help to study major subjects	3.80(±0.13)
4.	This training would help to study clinical practice	4.18(±0.11)
5.	This educational video could serve as introductory to clinical practice	4.07(±0.68)
6.	I've got an interest in this specialty through video-assisted class	4.34(±0.74)
7.	I felt that the anatomy lab is fun with this training program	4.02(±0.10)
8.	I would like to recommend this to a friend teaching methods.	4.30(±0.09)
9.	I was interested in this training methods.	4.14±(0.11)
10.	This teaching method was appropriate for my level of knowledge.	3.98(±0.11)
11.	The training method gave me confidence	3.93(±0.15)

Total	4.12(±0.11)
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## 4. Discussion

Our study was conducted in order to obtain base material that could be harnessed for desirable teaching of basic curriculum by looking into effects of videos about surgical operations or therapies during class on self-directed learning, learning motivation, professional mind and satisfaction levels.

Self-directed learning ability of test subjects was increased to 13 points after video class. This is consistent with previous studies on video-aided introductory nursing class where they reported that practical demonstrations on videos could help students to be focused and understood, increasing their class participation<sup>17</sup>. In<sup>18</sup> stated that strategic developments of teaching to find ways to stimulate students drive for learning are needed since self-directed learning was increased due to interactions between students and teachers.

They also made clear that personalities and attitudes of students result in significant differences in their ability of self-directed learning<sup>19</sup>. The higher their ability was the stronger their absorption. As students tend to lay learning desires in their mind once that kind of attachment to learning was developed, it is important to develop a cooperative learning strategy encouraging students to join class activities.

As shown in our study, self-directed learning ability became improved as video-aided class built up intellectual curiosity and willingness to learn for themselves<sup>17</sup>. If such videos showing real clinical practices were effectively applied, students could step forward to getting closer to the curriculum. Video application itself could draw attention to their study and leading effects for more concentration. If case-based study is administered, self-directed learning are more effective than face-to-face class<sup>20</sup>. Because combined video-aided and case-based study were expected to raise teaching efficiency, more research should be necessary. Learning motive defined as a desire to be educated includes attractiveness to keeping study with triggered intrigues<sup>12</sup>. In our study learning motive showed little difference between the test (92.8) and control (90.0) groups, which is consistent with previous studies<sup>21,22</sup>. They explained that as audiovisual-based education continued, repercussions and cognitive overloads occurred without thoughtful attention<sup>22</sup>. In contrast,

case-based class accompanied by videos increased learning motive of nursing students in the test group more significantly than the control<sup>23</sup>. This was because learning motive was increased as students who started showing their interests in class activities were eagerly to find answers when key learning points or questions were addressed through videos. Accumulative effects were considered to be not enough to trigger learning motive in short-term studying like our programs because inner learning motive that could formulate self-directed learning could be only accumulated in long-term<sup>24</sup>. However, there was not much difference in the professional self-concept post-learning. This was in contrast to previous studies that there was significant difference in the professional self-concept after cooperation learning programs in a small group<sup>25</sup>.

This result might come from the fact that we used sophomore students as test subjects who did not have a strong sense of vocation. One study with graduating nursing students showed high professionalism, particularly higher in male students than female students. It was because senior students could have more major knowledge than junior students and have firmer or more established knowledge. Male students were far more positive to points of view toward their jobs as they had barely managed to be enrolled in public health department in such a very competitive job market<sup>26</sup>. Professional self-concept tended to increase as practice classes were more incorporated and higher attitudes toward professionalism were developed. Therefore educators need to make their efforts to develop strategic educational programs.

After running our program, satisfaction level was 4.12 out of 5 in full, which is consistent with previous studies<sup>27</sup>. By looking into each questions, "This study was helpful to learn about anatomy" had the highest points, 4.39. This could be explained by the founding that nearly 40 % of both the test and control groups who felt they need improvements in anatomy were stimulated after watching surgical videos. Subsequently "I was interested in our program" was followed by "I would recommend our program", which suggest that students were satisfied with our program.

If videos of clinical practice were used, because surgical approaches or latest points of view were likely to change, continuous data collection required. Also, qualities of educators should be sufficient enough. Otherwise, it could end up with being superficial education while

competency of educators could have an influence on deeper education, so that students could be motivated. Therefore, it is considered that, to apply clinical practice videos, educators who have accumulated anatomical and pathological knowledge, and have had educational experiences on clinical practices over the years should teach class.

## 5. Conclusion

Our study was designed to investigate effects of clinical practice videos on self-directed learning ability, learning motivation, professional self-concept, satisfactory levels of public health students who took the basic curriculum for pre- and post-learning using nonhomogeneous control group. Our results showed that significant differences in self-directed learning ability were found, and video-aided class could help students to get interested in the basic curriculum, such as anatomy and pathology. Students were expected to have a desire to learn as they were highly intrigued along with increased self-directed learning ability. However, if clinical practice video was applied, it was important to prepare accurate study material and up-to-date points of view, and experiences of educators who have built up their career in clinical practice.

## 6. Acknowledgement

This study was supported by a grant of the Kwangju Women's University (KWU116-094).

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