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# A Study on the Level of Awareness and the Current Performance Level of Self-directed Learning in Nursing Students

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# 간호대학생의 자기주도 학습에 대한 인식과 수행 실태

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**Abstract** The purpose of this study is to investigate the level of awareness and current performance level of self-directed learning (SDL) in nursing students. The core concepts were defined and a rubric was developed through literature review. It was applied later to subjects and the results were analyzed. According to the results, there were significant differences between the current performance level and the awareness level of SDL in all items. Students who chose nursing as a major due to their high school/SAT grades showed lower current performance level than others. There were insignificant differences in the current performance level influencing the next grade. The level of awareness showed insignificant differences according to the reason for selecting nursing as a major, satisfaction on major, and grade point average (GPA). In conclusion, there was a discrepancy between the level of awareness and the current performance level of SDL of nursing students, which indicates that they were aware of the necessity of SDL, but did not actually perform it. Nursing educators should seek for strategies that can improve SDL ability of their students as well as to better grasp the level of the SDL of their student and the current performance level of SDL to apply them to the instructional design.

**요 약** 본 논문은 간호학생들의 자기 주도 학습에 대한 인식수준과 수행수준을 파악하기 위하여 시도되었다. 각종 자기 주도 학습과 관련 문헌을 고찰하여 자기 주도 학습의 핵심개념을 규명한 다음 이에 부합되는 루브릭을 개발하였다. 이를 간호 대학생에게 적용하여 자기 주도 학습에 대한 인식수준과 실행수준을 확인하였다. 연구결과에 의하면 간호학생들의 자기 주도 학습에 대한 인식수준과 수행수준은 모든 항목에서 유의한 차이가 있었다. 또한 간호학생들의 자기 주도 학습에 대한 수행수준은 입시성적에 따라 간호학을 선택한 학생이 낮았지만, 학년에 따른 유의한 차이가 없었다. 자기 주도 학습에 대한 인식수준은 전공만족도별, 학업성취도별, 전공 선택 동기 별로 유의한 차이가 없었다. 결론적으로 간호대학생의 자기 주도 학습에 대한 인식수준과 수행수준은 일치하지 않았으며, 이는 학생들이 자기 주도 학습의 필요성은 충분히 인식하고 있지만 실제로 실행에 옮기고 있지 않고 있음을 의미한다. 이에 간호육자들은 교육대상 학생들의 자기 주도 학습 능력과 현황을 구체적으로 파악하고 이를 강화하고 향상시킬 수 있는 교수학습 전략을 개발해야 할 필요성이 있다.

**Keywords :** Cognition, Nursing students, Metacognition, Motivation, Self-directed learning, Volitional action

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# 1. Introduction

## 1.1 Necessity for research

Highly complicated and increasingly upscale skills for clinical nursing practice are required in recent worldwide health care environment due to the state-of-the-art medical knowledge as well as the cutting-edge medical equipment. The role of the nursing educators, thereby, is critical to improve capacity of nursing students beforehand since it is quite challengeable for the newly-graduated nurses to adapt quickly to the rapid changing health care environment and respond properly to the diverse changes[1]. In other words, the ultimate goal of nursing education is to cultivate critical thinking, problem-solving skills, and clinical reasoning ability of which importance is increasingly stressed in clinical settings. According to this, nursing education programs have changed over to learner-centered program from teacher-centered one in order to cultivate nursing students' self-directed learning(SDL) ability through the problem based learning(PBL), team based learning(TBL), or debating classes where the learners actively participate.

SDL is the way of learning in which the learner has responsibility for his/her own overall learning process including planning, implementing, evaluating, etc., thereby stressing the learner's role and defining the teacher's role as helping learners search for proper information efficiently as well as analyze and utilize that information[2]. Through SDL, that is, students can enhance their problem- solving skills and improve their clinical performance based on critical thinking[3]. However, according to Organization for Economic Co-operation and Development(OECD), SDL ability of Korean adolescents is one of the lowest[4].

Therefore, nursing educators should deeply understand the concept and methods of SDL, grasping the current performance level of SDL of their students.

In the field of nursing education, studies on SDL have been done since 1980s, which have pointed out the necessity of significant change of methods for nursing education[5]. However, SDL is not a clear concept to understand and thus it is difficult to evaluate properly students' SDL ability since the specific definition of SDL is varied by each scholar and the related terms are different[6]. Also, previous researches on SDL were not about logical analysis of the concept of SDL itself, but mostly about correlation with each variable such as campus life adaptation[7], ability for clinical performance[3], problem-solving skills[8], PBL[9], attention control[10], relevance to learning[11], academic achievement[6]. Moreover, the Self-Directed Learning Readiness Scale(SDLRS) by Guglielmino[12] used frequently to estimate SDL has its limit to estimate actual competencies or learner's current performance level of SDL since the scale does not focus on learner's current performance level of SDL. Furthermore, SDL is often confused with self-regulated learning, self-planned learning, inquiry learning, self-education, etc.[12,13]. The definition and utilization of SDL are varied according to the theoretical background or interest of each scholar, which makes its concept, features and objectives extensive, complicated and obscure. There are several studies which even confused SDL with self-study. Lee[13] said that there were certain gaps on understanding of SDL between teachers and learners, so it is difficult to apply SDL to teaching-learning process.

Therefore, we will identify the core concepts of SDL, and then assess the level of awareness on necessity and the current performance level of SDL of nursing students in order to provide the baseline data for improving teaching-learning methods which cultivate SDL ability of nursing students.

## 1.2 Purpose

The purpose of this study is to find out nursing students' level of awareness and current performance level of SDL. The specific objectives are as follows.

First, the core concept of SDL will be identified by thorough literature review and based on that, a rubric

will be developed to grasp nursing students' level of awareness and performance level on SDL.

Second, the level of awareness on SDL of nursing students and their current performance level will be grasped according to variables such as grade, gender, understanding on SDL, academic achievement, level of satisfaction on nursing major, and why they chose nursing science as their major.

## 1.3 Definition of the terms

### 1.3.1 Self-directed learning

Self-directed learning(SDL) is a series of learning process or method that a learner him/herself without any help diagnoses his/her own learning desire, sets the learning objectives, secures learning resources including human resources, selects and implements proper learning strategy, evaluates learning results and then feeds the whole process back into a proper stage according to the evaluation[14]. Corno & Mandinach[15] suggested that metacognitive control and monitoring is the core process of self-regulation. Also, they defined SDL means that a learner's ability to select his/her learning behavior with his/her initiative motives and lead the whole learning process with continuous self-evaluation on learning results, thereby achieving expected outcomes. In other words, SDL is possible when a learner controls his/her own cognition, motivation, and volitional action with his/her metacognition of which level is the key to efficient learning[16]. Therefore, we define SDL is that a learner him/herself, regardless of any help or guide of others, proceed his/her learning by controlling and monitoring his/her cognition, motivation, and volitional action, which also means process of knowing to perform simultaneously a series of metacognitive behaviors described as Fig. 1 in learning process.

### 1.3.2 Metacognition

Metacognition means one individual's thoughts about thinking, contemplating ability to understand the meaning and control the awareness during cognitive activity[16]. Thus, metacognition consists of knowledge and control on cognition. Knowledge on cognition is related to learning itself and selecting problem-solving strategy while control on cognition is related to a course of confirming the results, planning, and evaluating learning strategy[17]. That is, metacognition is not merely a competency which can be developed by learning but also a course or ability with which a learner learns how to check his/her own thoughts every minute by identifying what he/she is doing and whether the way of doing it is right or wrong as well as whether he/she understands the knowledge, then sets a proper goal, uses strategies to realize the goal, and finally evaluates the whole learning process[18].

In this study, we define metacognition as intellectual capacity or cognition which a leaner uses for successful learning and problem-solving. In order to develop metacognition, a learner should control his/her motivation and utilize a variety of strategies including volitional action.

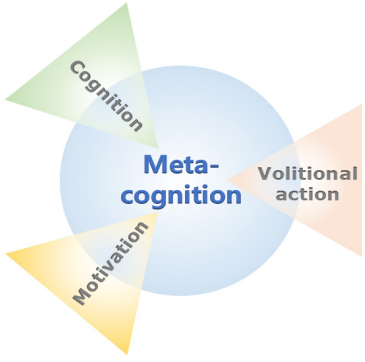


Fig. 1. Concept of Self-directed Learning

### 1.3.3 Academic achievement

Academic achievement is a concept that integrates all the learning results and academic performances estimated by specific methods and criteria such as acquired knowledge, function, intelligence, attitude, values, etc. after students' completing a certain education program[6]. In a broad sense, academic achievement is a complex concept which includes a

learner's ability or behavioral tendency acquired through coherent learning activities based on a certain educational objectives. Commonly, academic achievement usually means school grades or competence acquired through a teaching-learning process[19]. In this study, academic achievement means Grade Point Average(GPA) of nursing students who answer the SDL rubric.

## 2. Methods

### 2.1 Study design

In this descriptive research, the key terms were defined by identifying core concepts of SDL through literature reviews and grasping its related variables. Based on this, SDL and its necessity were understood as well as a rubric for evaluating the level of awareness and the current performance level of SDL was developed. The rubric was applied later to nursing students and then the results from self-reported instruments were analyzed. Through this process, relations between SDL and its related variables including academic achievement were verified.

### 2.2 Research subjects

The research was performed on the total of 688 nursing students of S university in Chungbuk province and D university in Gyeonggi province which had passed the accreditation for nursing education of Korean Accreditation Board of Nursing. All the subjects understood the purpose of this study and consented to participation. The number of sampling was decided utilizing G*Power 3.1 analysis program. When the effect size was .15, level of significance was .05 and power of test was .95, the minimum sample size for correlation analysis was computed as n=166, thereby the final number of subjects(n=688) of this study was appropriate for statistical analysis. The computed minimum sample size suggests the smallest sample size it should be or could possibly be, although a larger amount is acceptable or very possible. Also, researchers are not allowed to make arbitrary decisions to eliminate subjects from the study sample. So, students without disqualifications, who wanted to participate in this study were all included as study subjects[20].

### 2.3 Research instrument

#### 2.3.1 Development of the rubric for assessing SDL

We had developed the rubric for assessing SDL, which was then utilized as a research instrument. A rubric is a criteria scale which itemizes, defines and then scores the current performance level students should carry out[21]. A rubric is a rating standard which descriptively indicates the explanation for the characteristics of outcomes or performance of learners[22]. Therefore, the rubric for assessing SDL utilized in this study evaluates the level of awareness of subjects on SDL as well as the current performance level. We reviewed 63 precedent researches including Garrison[23] related to SDL or metacognition and then established the criteria, itemizing features and key contents of SDL. The level of each item was categorized to beginner level(1 point), intermediate level(2 points) and advanced level(3 points). The followings are the procedure of development in detail.

A total of 63 precedent researches were reviewed including Knowles[15] that suggested the concept of SDL for the first time, Zimmerman[24], Pintrich & DeGroot[25] that studied on SDL and self-regulated learning, and Jho & Chae[3] that focused SDL of nursing students. Based on this, we defined SDL as Fig.1 and developed the rubric for assessing SDL. Through adequate correction and complement by 3 nursing professors, one of whom has Ed. D., the rubric had 30 items and each of them inquired about the level of awareness and the current performance level. In order to secure the content validity of the items, the rubric was applied to 12 students by each grade and then the items were modified or complemented in cases

where the students misperceive or misunderstood the question. The final rubric is presented as Table 1.

#### 2.3.2 Validity and reliability of the rubric for assessing SDL

Table 1. indicates the internal consistency of 30 items on the rubric for assessing SDL. The inter-item consistency of items for the level of awareness turned out to be Cronbach's α= .940. The inter-item consistency of items for the current performance level proved to be Cronbach's α=.901. Also, in order to confirm whether each property of 3 categories, volitional action, cognition and motivation which consist of the rubric for assessing SDL had been measured properly or not, the inter-item consistency of each category was calculated. The inter-item consistency of the level of awareness by each category was Cronbach's α=.794～.896, The inter-item consistency of the current performance level by each category was Cronbach's α=.759～.787.

### 2.4 Data collection process and analyzing methods

The data collection process in this study is as follows. First, IRB approval was granted (IRB no. SMU-2015-04-004-01) from the institutional review board of S university. After that, written informed consent was obtained from all subjects before applying the rubric for assessing SDL to subjects. With detailed explanations about the research purpose and procedure, data were collected from June 2 to 5, 2015. The collected data were analyzed utilizing SPSS/WIN (ver.20.0). In order to verify validity and reliability, internal consistency is measured with Cronbach's α. Pearson correlation was analyzed for correlation between the level of awareness and the current performance level. Differences between the level of awareness and the current performance level as well as differences according to each variable were verified using t-test and ANOVA.

## 3. Results

### 3.1 General characteristics of the subjects

The subjects of this study consisted of 32.1% (n=221) of freshmen, 33.0% (n=227) of sophomores, 12.5% (n=86) of juniors, and 22.4% (n=154) senior students. The average age of the subjects was 20.64±2.84, ranging from 18 to 24. 85.3% (n=587) of subjects were female while 14.7% (n=101) were male. 75.5% (n=516) responded that they 'know well' about

**Table 1.** Reliability of Self-directed Learning Rubric

| Categories | Components | Serial no. | no. of items | Reliability(Cronbach's α) | |
|---|---|---|---|---|---|
| | | | | Level of Awareness | Current Performance Level |
| volitional action | planning | 1, 2 | 2 | .794 | .759 |
| | organizing | 3, 4 | 2 | | |
| | goal setting | 5, 6 | 2 | | |
| | keep recording | 7, 8 | 2 | | |
| | structuring environment | 9, 10 | 2 | | |
| | subtotal | 1~10 | 10 | | |
| cognition | memorizing | 11, 12 | 2 | .896 | .776 |
| | seeking information | 13, 14 | 2 | | |
| | rehearsing | 15, 16, 17 | 3 | | |
| | transforming | 18, 19, 20 | 3 | | |
| | subtotal | 11~20 | 10 | | |
| motivation | self evaluation | 21, 22, 23 | 3 | .887 | .787 |
| | monitoring | 24, 25, 26, 27 | 4 | | |
| | self-reinforcement | 28, 29, 30 | 3 | | |
| | subtotal | 21~30 | 10 | | |
| SDL-R | total | 1~30 | 30 | .940 | .901 |

Table 2. Level of Awareness and Current Performance Level of Self-directed Learning

(n=688)

| Categories | Elements | Items* | Level of awareness M±SD(rank) | Level of performance M±SD(rank) | t(p) |
|---|---|---|---|---|---|
| Volitional action | planning | finding time to prepare the classes | 2.92±.31(03) | 1.92±.58(27) | 40.68(.000) |
| | | allocating time according to difficulty levels | 2.83±.41(23) | 2.13±.69(18) | 25.39(.000) |
| | organizing | scheduling for preparing tests | 2.89±.35(16) | 2.03±.56(24) | 36.82(.000) |
| | | considering the required time | 2.77±.48(29) | 2.25±.70(10) | 19.36(.000) |
| | goal setting | setting up short- and long-term objectives | 2.84±.41(22) | 1.98±.67(26) | 30.74(.000) |
| | | listing detailed objectives | 2.87±.38(19) | 1.84±.66(29) | 37.91(.000) |
| | keep recording | keeping records(note-taking of lectures) | 2.90±.33(11) | 2.44±.68(01) | 17.92(.000) |
| | | correcting and resorting data | 2.82±.44(26) | 1.86±.64(28) | 35.14(.000) |
| | structuring environment | organizing and cleaning up the surroundings | 2.79±.47(28) | 2.31±.70(08) | 17.73(.000) |
| | | optimizing between immersing and relaxing | 2.82±.50(25) | 1.73±.75(30) | 34.29(.000) |
| Cognition | memorizing | memorizing | 2.93±.27(02) | 2.11±.46(19) | 42.94(.000) |
| | | understanding and utilizing | 2.90±.32(10) | 2.04±.56(22) | 35.73(.000) |
| | seeking information | connecting the text book with the class | 2.89±.38(17) | 2.39±.59(02) | 20.58(.000) |
| | | getting the gist | 2.91±.31(08) | 2.15±.52(16) | 35.29(.000) |
| | rehearsing | monologue(putting questions to oneself) | 2.90±.33(11) | 2.11±.69(20) | 29.23(.000) |
| | | applying and utilizing | 2.92±.30(04) | 2.21±.55(13) | 31.22(.000) |
| | | sharing opinions and learning | 2.85±.46(21) | 2.24±.77(12) | 20.45(.000) |
| | transforming | simplifying the learning content | 2.90±.35(13) | 2.15±.71(16) | 26.98(.000) |
| | | summarizing and utilizing main concepts | 2.90±.37(14) | 2.29±.70(09) | 21.75(.000) |
| | | applying to everyday life | 2.82±.44(24) | 1.99±.59(25) | 33.13(.000) |
| Motivation | self-evaluation | evaluating learning achievements | 2.88±.36(18) | 2.03±.61(23) | 33.97(.000) |
| | | confirming growth made through learning | 2.85±.43(20) | 2.35±.66(05) | 19.27(.000) |
| | | evaluating learning effectiveness | 2.89±.36(15) | 2.17±.72(14) | 25.61(.000) |
| | monitoring | checking the level of understanding on the learning content | 2.91±.31(09) | 2.16±.48(15) | 37.11(.000) |
| | | checking and complementing test results of each subject | 2.91±.31(05) | 2.38±.96(03) | 22.34(.000) |
| | | checking whether fulfilling the teaching intention or not | 2.91±.31(06) | 2.34±.70(06) | 21.29(.000) |
| | | self-monitoring by continuously checking test results | 2.91±.32(07) | 2.33±.63(07) | 23.74(.000) |
| | self-reinforcement | overcoming difficulties | 2.93±.29(01) | 2.36±.61(04) | 23.57(.000) |
| | | compensation for the good works | 2.79±.46(27) | 2.24±.61(11) | 21.49(.000) |
| | | sense of responsibility for low grades | 2.68±.49(30) | 2.06±.56(21) | 23.72(.000) |
| SDL | | | 86.35±6.42 | 64.58±9.65 | 52.33(.000) |

*Level of each item was categorized to beginner level (1 point), intermediate level (2 points) and advanced level (3 points).

SDL while 24.5% (n=167) do 'not know' about SDL. About the 'reason for selecting nursing as a major', 37.8% (n=260) of subjects responded that they chose nursing as a major due to their 'aptitude', 30.2% (n=208) due to 'high employment rate', 23.1% (n=159) due to 'recommendation' by parents, older relatives, or teachers, 5.8% (n=40) due to 'high school/scholastic aptitude test (SAT) grades', and 3.1% (n=21) due to 'others'. 'Others' includes 'to be a nurse (n=5)', 'to select what I want (n=3)', 'for the future (n=1)', 'to study hard (n=1)', 'to live a altruistic life (n=1)', and 'an impromptu choice (n=2)'. About the level of 'satisfaction on major', a total of 85.4% (n=588) of subjects were satisfied with their major as 64.8% (n=446) answered 'satisfied' and 20.6% (n=142), 'very satisfied'. Meanwhile, 14.5% (n=100) of subjects were unsatisfied with their major as 12.5% (n=86) answered 'unsatisfied' and 2.0% (n=14), 'very unsatisfied'. About the GPA of subjects except for freshmen who did not have any past GPA, 73.4% (n=343) got GPA 'above 3.0~below 4.0', 15.4% (n=72), 'above 4.0', 9.2% (n=43), 'above 2.0~below 3.0' and 1.9% (n=9), 'below 2.0' (Table 4).

### 3.2 Level of awareness and current performance level of SDL

The level of awareness on SDL and the current performance level of nursing students are as follows.

For each category, the level of awareness showed a mean score of 2.93~2.66, while the current performance level showed a mean score of 2.44~1.73. Differences between the level of awareness and the current performance level were statistically significant in all items (t=17.731~42.944, p<.001).

Level of awareness on SDL in descending order was as follows: overcoming difficulties (2.93), memorizing (2.93), finding time to prepare the classes (2.92), applying and utilizing (2.92), checking and complementing test results of each subject (2.91), checking whether fulfilling the teaching intention or not (2.91), self-monitoring by continuously checking test results (2.91), getting the gist (2.90), checking the level of understanding on the learning content (2.91), etc. On the other hand, the level of awareness on SDL in ascending order was as follows: sense of responsibility for low grades (2.68), considering the required time (2.77), organizing and cleaning up the surroundings (2.79), compensation for the good works (2.79), correcting and resorting data (2.82), optimizing between immersing and relaxing (2.82), applying to everyday life (2.82), allocating time according to difficulty levels (2.83), setting up short- and long-term objectives (2.84), etc.

The current performance level of SDL in descending order was as follows: keeping records (note-taking of lectures) (2.44), connecting the text book with the class (2.39), checking and complementing test results of each subject (2.38), overcoming difficulties (2.36), confirming growth made through learning (2.35), checking whether fulfilling the teaching intention or not (2.34), self-monitoring by continuously checking test results (2.33), organizing and cleaning up the surroundings (2.31), getting the gist (2.29), etc. Meanwhile, the current performance level in ascending order was as follows: optimizing between immersing and relaxing (1.73), listing detailed objectives (1.84), correcting and resorting data (1.86), finding time to prepare the classes (1.92), setting up short- and long-term objectives (1.98). applying to everyday life (1.99), scheduling for preparing tests (2.03), evaluating learning achievements (2.03), understanding and utilizing (2.04), etc. (Table 2).

**Table 3.** Correlation between Level of Awareness and Current Performance Level of SDL

n=688

| Awareness / Performance | Self-directed learning | Volitional action | Cognition | Motivation |
|---|---|---|---|---|
| Self-directed learning | .129** (.001) | .137** (.001) | .084* (.034) | .126** (.001) |
| Volitional action | .090* (.023) | .155** (.000) | .023 (.562) | .064 (.108) |
| Cognition | .131** (.001) | .113** (.004) | .134** (.001) | .104** (.008) |
| Motivation | .121** (.002) | .091* (.021) | .068 (.087) | .165** (.000) |

* $p$<.05 ** $p$<.01

The correlation between the level of awareness and the current performance level of SDL was as follows. There was a significant low correlation between the level of awareness and that of its each subcategory including volitional action, cognition and motivation, and the current performance level and that of its each subcategory (r=.084~129, p< .05) (Table 3).

### 3.3 Level of awareness and Current performance level according to variables

The comparison of the level of awareness and the current performance level according to each variable such as grade, gender, understanding of SDL, reason for selecting nursing as a major, satisfaction on major, and GPA was as follows.

Among all the variables, variables with significant differences by each group were gender, understanding of SDL, reason for selecting nursing as a major, satisfaction on major, and GPA. The gender differences were significant only in the level of awareness while differences according to the other variables were significant in the current performance level. There were no significant differences in the level of awareness according to understanding of SDL, but there were in the current performance level (t=5.33, P<.01). Also,

**Table 4.** Level of Awareness and Current Performance Level of Self-directed Learning according to Selection of Major, Satisfaction of Major and GPA (N=688)

| Categories | Variables | | Freq.(%) | Level of awareness on Self-directed Learning | | | | Performance level of Self-directed Learning | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Self-directed Learning | volitional action | cognition | motivation | Self-directed Learning | volitional action | cognition | motivation |
| Grade | Freshmen | | 221(32.1) | 2.88±.23 | 2.85±.25 | 2.89±.27 | 2.86±.29 | 2.12±.30 | 2.02±.36 | 2.13±.35 | 2.20±.34 |
| | Sophomore | | 227(33.0) | 2.86±.25 | 2.83±.26 | 2.87±.29 | 2.85±.27 | 2.18±.37 | 2.09±.42 | 2.19±.39 | 2.27±.39 |
| | Junior | | 86(12.5) | 2.90±.15 | 2.87±.17 | 2.93±.16 | 2.90±.17 | 2.14±.27 | 2.05±.29 | 2.18±29 | 2.20±.35 |
| | Senior | | 154(22.4) | 2.90±.16 | 2.86±.21 | 2.93±.16 | 2.90±.18 | 2.17±.29 | 2.04±.36 | 2.17±.33 | 2.28±.34 |
| | F(p) | | 688(100.0) | 1.76(.153) | 1.32(.270) | 2.27(.080) | 1.92(.125) | 1.76(.153) | 1.51(.211) | 1.08(.358) | 2.25(.081) |
| Gender | Male | | 101(14.7) | 2.83±.21 | 2.81±.25 | 2.87±.24 | 2.81±.30 | 2.10±.39 | 1.99±.42 | 2.14±.41 | 2.15±.43 |
| | Female | | 587(85.3) | 2.89±.21 | 2.86±.23 | 2.90±.25 | 2.88±.24 | 2.16±.31 | 2.06±.36 | 2.17±.34 | 2.26±.35 |
| | t(p) | | 688(100.0) | -2.14(.033)* | -1.81(.070) | -1.47(.142) | -2.68(.008)* | -1.95(.052) | -1.67(.095) | -.71(.480) | -2.70(.007)* |
| Understanding of self-directed learning | Know well | | 516(75.0) | 2.88±.21 | 2.86±.24 | 2.90±.25 | 2.88±.24 | 2.19±.32 | 2.09±.37 | 2.21±.35 | 2.27±.35 |
| | Not know | | 167(24.3) | 2.86±.22 | 2.83±.24 | 2.89±.23 | 2.85±.28 | 2.04±.32 | 1.94±.35 | 2.04±.35 | 2.14±.37 |
| | No response | | 5(0.7) | - | - | - | - | - | - | - | - |
| | t(p) | | 688(100.0) | 1.31(.190) | 1.51(.132) | .39(.691) | 1.37(.171) | 5.33(.000)** | 4.47(.000)** | 5.27(.000)** | 4.26(.000)** |
| Reason for selecting nursing as a major | aptitude | a | 260(37.8) | 2.90±.19 | 2.86±.23 | 2.93±.20 | 2.90±.20 | 2.23±.29 | 2.12±.35 | 2.26±.33 | 2.31±.32 |
| | high employment rate b | | 208(30.2) | 2.87±.24 | 2.85±.24 | 2.88±.28 | 2.85±.29 | 2.13±.33 | 2.05±.37 | 2.12±.35 | 2.21±.39 |
| | recommendation | c | 159(23.1) | 2.87±.23 | 2.86±.24 | 2.89±.25 | 2.85±.27 | 2.11±.32 | 2.01±.37 | 2.12±.35 | 2.19±.35 |
| | high school/SAT grades d | | 40(5.8) | 2.86±.28 | 2.86±.30 | 2.87±.33 | 2.86±.27 | 1.84±.35 | 1.78±.43 | 1.84±.36 | 1.95±.39 |
| | others | e | 21(3.1) | 2.87±.15 | 2.80±.23 | 2.87±.27 | 2.85±.24 | 2.13±.30 | 1.97±.37 | 2.13±.36 | 2.28±.31 |
| | F(p) Scheffe | | 688(100) | .76(.554) | .73(.575) | 1.75(.137) | 1.56(.182) | 10.19(.000)** a,b,c,e>d | 6.30(.000)** a,b,c,>d,e | 11.41(.000)** a,b,c,e>d | 7.31(.000)** a,b,c,e>d |
| Satisfaction on major | very unsatisfied | a | 14(2.0) | 2.74±.41 | 2.76±.30 | 2.69±.57 | 2.71±.42 | 2.12±.36 | 2.00±.46 | 2.12±.50 | 2.20±.30 |
| | unsatisfied | b | 86(12.5) | 2.86±.21 | 2.80±.26 | 2.90±.23 | 2.88±.22 | 1.95±.33 | 1.82±.35 | 1.98±.39 | 2.04±.36 |
| | satisfied | c | 446(64.8) | 2.88±.21 | 2.86±.23 | 2.90±.23 | 2.88±.25 | 2.14±.31 | 2.05±.36 | 2.15±.33 | 2.23±.36 |
| | very satisfied | d | 142(20.6) | 2.89±.21 | 2.87±.24 | 2.91±.24 | 2.87±.24 | 2.31±.28 | 2.20±.35 | 2.33±.31 | 2.39±.31 |
| | F(p) Scheffe | | 688(100) | 2.48(.060) | 2.81(.056) | 3.46(.016)* b,c,d>a | 2.16(.091) | 24.58(.000)** d>a, c>b | 19.42(.000)** c,d>b | 19.78(.000)** d>b,a | 18.74(.000)** d>b |
| Academic achievement (GPA) | above 4.0 | a | 72(10.5) | 2.89±.21 | 2.88±.19 | 2.90±.29 | 2.89±.22 | 2.33±.31 | 2.24±.34 | 2.30±.35 | 2.40±.35 |
| | 3.0~below 4.0 | b | 343(49.9) | 2.88±.21 | 2.85±.24 | 2.90±.22 | 2.87±.23 | 2.16±.33 | 2.04±.37 | 2.16±.36 | 2.25±.37 |
| | 2.0~below 3.0 | c | 43(6.2) | 2.86±.18 | 2.81±.24 | 2.90±.19 | 2.88±.18 | 2.03±.24 | 1.94±.29 | 2.06±.25 | 2.09±.27 |
| | below 2.0 | d | 9(1.3) | 2.77±.25 | 2.79±20 | 2.76±.32 | 2.78±.39 | 2.03±.32 | 1.87±.48 | 2.12±.29 | 2.09±.35 |
| | Not applicable (N/A)*** | | 221(32.1) | - | - | - | - | - | - | - | - |
| | F(p) Scheffe | | 688(100) | .97(.405) | .99(.397) | 1.23(.300) | .66(.578) | 15.60(.000)** a>c,d | 8.42(.000)** a,b>d | 8.22(.000)** a>b,c | 13.97(.000)** a>b, c |

*p<.05 **p<.01 ***Freshmen had no previous GPA.

there were no significant differences in the level of awareness according to reason for selecting nursing as a major, but there were in the current performance level (F=10.192, P<.01)

The level of awareness on SDL according to satisfaction on major showed insignificant differences except for the cognition part, while all three subcategories of SDL which are cognition, volitional action and motivation of the current performance level of SDL showed significant differences. In other words, subjects who are 'very satisfied' or 'satisfied' with their major showed significantly higher current performance level of SDL than those who are 'very unsatisfied' or 'unsatisfied' with their major (F=24.577, P<.01). Regarding volitional action, subjects who are 'very satisfied' or 'satisfied' with their major showed significantly higher current performance level of SDL than those who are 'very unsatisfied' or 'unsatisfied' with their major (F=19.420, p<.01). In terms of cognition, subjects who are 'very unsatisfied' with their major showed significantly lower level of awareness on SDL than the others(F=3.462, p<.05) as well as those who are 'very unsatisfied' or 'unsatisfied' with their major showed significantly lower current performance level of SDL than those who are 'very satisfied' (F=19.778, p<.01). In motivation part, subjects who are 'very unsatisfied' showed significantly higher current performance level of SDL than those who are 'unsatisfied' (F=18.743, p<.01).

In accordance with GPA, there were no significant differences in the level of awareness on SDL while there were the current performance level of SDL. Subjects with GPA 'above 4.0' showed significant higher current performance level than those with '2.0~ below 3.0' or 'below 2.0' (F=15.601, p<.01). Regarding volitional action, subjects with GPA 'above 4.0' and '3.0~below 4.0' showed significant higher current performance level than those with 'below 2.0' (F=8.415, p<.01). In terms of cognition and motivation, subjects with GPA 'above 4.0' showed significant higher current performance level than those with '3.0~ below 4.0' or '2.0~below 3.0' (F=8.224, p<.01; F=13.974, p<.01) (Table 4).

## 4. Discussion

University students who had been highly dependent on private education may have trouble going through university curricula due to lack of self-directedness[26]. In this sense, we looked into the level of awareness and the current performance level of SDL of nursing students. As a result, the highest mark of the level of awareness was 2.93 and the lowest was 2.66, meaning that subjects are highly aware of the necessity of SDL, while the highest mark of the current performance level was 2.44 and the lowest was 1.73, meaning the subjects' lack of practice of SDL. In other words, there was a discrepancy between the level of awareness on SDL and the current performance level of SDL. Scores marked on the motivation part were higher than those on the cognition or volitional action part in both the level of awareness and the current performance level, which means students are well motivated but lack the power of execution showed in Table 3. Scores marked on the volitional action part were lower than those on the cognition or motivation part in both the level of awareness and the current performance level. More specifically, high scores of the motivation part in the current performance level means that students may try to secure self-directedness by motivating themselves while low scores of the volitional action part in the current performance level means students' lack of metacognition. In other words, subjects are quite motivated about SDL, but not enough to carry the idea into practice, perhaps due to the aforementioned perspective[26].

There were no significant differences in the level of awareness on SDL according to each variable except for gender. Female students showed higher level of awareness than male students. Noticeably, there were no significant differences in both the level of

awareness and the current performance level as passing on to the next grade. This means that students never make any progress in SDL ability throughout university curricula. Also, 75.0% (n=516) of the subjects who answered that they 'know well' about SDL showed higher current performance level of SDL than 24.3% (n=167) who answered they do 'not know' about SDL.

There is a discrepancy between the results of this study and that of Lee[27] and Oh[11] who insisted that there were no significant differences according to gender while there were according to each grade in the scores measured by SDLRS of Gugliemino. This is mainly because, as mentioned above, actual competencies or learner's current performance level of SDL cannot be measured by SDLRS. Given that Brockett & Hiemstra emphasized SDL ability is not naturally acquired as one is growing up, but actively learned from childhood by continuous practice[28] as well as Paris & Newman[29] asserted learners have potentials to achieve self-regulation by themselves, the fact that the current performance level of SDL of nursing students showed insignificant differences as passing on to the next grade asks some thought provoking questions to nursing educators.

There were no significant differences in the level of awareness according to reason for selecting nursing as a major, but there were in the current performance level. In other words, subjects who chose nursing as a major due to 'high school/SAT grades' showed significantly lower current performance level than those who chose nursing because of other reasons. Hong[30] found that subjects who responded that they had chosen their major 'to be an expert of a certain field' showed the highest scores of SDLRS. This is in line with the results that students had more self-directedness when they had spontaneous and internal motivation to select nursing as a major in this study.

The results of this study regarding the level of awareness on SDL according to satisfaction on major are in line with the results suggested by Cho[31] who insisted that self-directedness showed significant differences according to the level of satisfaction on the major, by Kim[32] who asserted that the level of satisfaction on university course would have indirect influence on academic achievement by the medium of SDL, by Cornin & Taylor[33], by Rust & Oliver[34], and by Lee & Kim[35].

The level of awareness showed insignificant differences according to GPA while students with GPA above 4.0 showed mostly higher current performance level than other students. This result is coherent to those of Cornin & Taylor[33], Rust & Oliver[34], Lee & Kim[35], and Oh[11]. Also, Kim[36] who insisted that SDL would have direct influences on academic achievement, Zimmerman & Martinez[37] who said that there was a significant relevance between SDL and academic achievement, Pintrich & DeGroot[25] who concluded that regardless of the type of tasks, SDL ability and academic achievement would have a positive significant relevance, and Morris & Finnegan[38] who found that SDL ability would be a proper concept which could prospect a leaner's academic achievement all support the findings of this study.

## 5. Conclusion

As for SDL ability is closely related to not merely improvement for academic achievement but also survival ability for social success throughout one's life, it is critical to find out the influencing factors of SDL ability and the way to enhance SDL ability. Thus, it is obviously essential to search what role the educators should play in order to improve SDL of their students. Commonly suggested educators' role is a helper, mentor or facilitator, but the problem is these suggestions are made without specific details about how and with what students should be helped, advised or facilitated. There has not been any research for role of educators to improve student's SDL yet, but as the

basis for that, the conclusions from this study are suggested as follows:

First, most of the Korean nursing students became freshmen of universities with little experience of SDL in the reality of education in Republic of Korea.

Secondly, subjects are quite aware of and motivated about SDL, but not enough to carry the idea into practice. Moreover, the results indicated that students never make any progress in SDL ability throughout university curricula.

Thirdly, we found out lack of validity of SDLRS by Guglielmino when it comes to verifying the leaner's actual SDL ability or current performance level of SDL. Therefore, repetitive further studies with various samples of nursing students should be done to evaluate and verify the SDL ability of them.

Lastly, nursing educators should actively seek for the ways and strategies which can improve and reinforce SDL ability of their students as well as grasp the level of their students' SDL ability and the current performance level of SDL to apply them to the instructional design.

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