Effects of the Self-Directed Learning Coaching Program on meta-cognitive and time management ability of learners

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Abstract: The study attempted to explore the effects of a Self-Directed Learning coaching program developed on the basis of the SMMIS model on the ability of meta-cognitive and time management ability of elementary and middle school students in Korea. Eighty-six students participated in the program from April 3 to December 22, 2017 at C Youth Center in D district of Seoul, Korea. The Self-Directed Learning Diagnostic Test(Choi & Kim, 2017) was used to analyze the effectiveness of the program. The paired sample t-test was used to find out the difference between the pre-test and post-test scores of the program. The results were as follows. First, the participants' post-test scores of meta-cognitive ability increased significantly. Second, the participants' post-test scores of time management ability also increased significantly. In conclusion, the SDL coaching program based on the SMMIS model was effective for improvement of the meta-cognitive and time management ability of elementary and middle school students.

Keyword : self-directed learning, SMMIS, meta-cognition, time management, coaching for learning

INTRODUCTION

Life-long learners in the contemporary society of the Forth Industrial Revolution, are required to consistently develop not only the ability to acquire the knowledge itself, but also the ability to reconstruct the various knowledge and information to fit the purposes required by the specific situations. Especially, with the development of artificial intelligence, unpredictable vast amounts of knowledge and information require more than just the ability to utilize the physical tools for them. In the massive amounts of knowledge and information, to develop and share the new culture, Self-Directed Learning(SDL), that is, the ability to reconstruct the various knowledge and information to fit the specific requirements, is one of the mainly required ability.

SDL has been examined from the 1960's through 1970's to the recent date, and there are various views on the approach to it. It falls into 3 main approach, such as SDL as a personality characteristic approach, SDL as a learning process approach and integrating approach that tries to combine the both. Choi and Kim (2010) define SDL as a leading process where leaners utilize their own material and human resources, based on the self-control and self-regulation. They also emphasize developing the intrinsic motivation, meta-cognition and behavior-regulation training as a practical strategies for SDL.

While the SDL has been firstly appeared to explain the unconstrained and experience based learning activities which are main characteristic of adult learners (Knowles, Holton, & Swanson, 2015), recently, it is getting a lot attention in school education as a core concept of teaching and learning methods. In South Korea, the 7th curriculum takes an objective to develop talents with SDL ability. It is also applied into the recent revised curriculum(2015) by providing the opportunities of individualized learning.

Recently, there are many cases where some associations give licenses of SDL coach, when they complete some training programs. These SDL coaches try to motivate and assist the students who are lack of desire and self-confidence, to analyze their own learning process and learning environments, and improve their learning abilities.

According to the needs of the times, researches on learning coaching and SDL are being carried out with the adolescents in the school education. However, most of them divide the learning coaching and SDL, and focus on the effects of leaning coaching on the sub-factors of SDL (Lee, 2013; Shin & Lee, 2010; Yoon, 2012; Lee & Kim, 2013; Choi, 2011). But they have some limitations in examining the differential effects of learning coaching depending on the individual ability of instructors, the effectiveness of education program that could educate the coach to consistently train the students, and the practical strategies and the results of them.

Education environments in the future society of the Fourth Industrial Revolution with the demands of times, would be in transition from submissiveness, where the Korean government determines the specific

subjects of curriculum regardless of the willingness of the students, to activeness where the students would actively select the subjects what they want according their individualized aptitudes and interests. In other words, it would be the transition from the traditional, passive learning environments to active and autonomous learning environments. In this open learning environments, it is necessary for the lifelong learners to develop meta-cognitive ability that could plan, monitor and regulate their own cognitive process, and the time management ability that could deliberately use and plan the learning time thereby that could foster the effective learning environments.

Based on these necessities, the current study tried to examine the effects of a SDL coaching program based on the SMMIS(Self-motivation, Motivation, Meta-cognition, Interaction, Self-reflection) model, which was developed by S university and being applied to elementary and middle school students' meta-cognitive and time management ability of C Youth Training Center in Seoul.

SMMIS MODEL BASED SDL COACHING PROGRAMS

According to Choi & Kim(2010), SDL is to properly understand their own comprehension and pace with the self-regulated learning training, and completing the self-directedness by practices and training of motivation, cognition, and behavior domain, based on assimilation accommodation. The SDL coaching program of the study was developed by Choi & Kim(2010) based on the SMMIS model, which is being applied to elementary, middle and high school students and adjusted to the environments of C Youth Training Center.

It is developed to expand the comprehension domain of the learners by repetitive monitoring and feedback of the learning coach after the learning process with the various learning strategies, which is preceded by the checking of the comprehension ability and planning the learning contents by themselves, without any constraints on the types of the subjects. The learning process was designed to consistently repeat according to their own planning of learning contents by the small chapters. It consisted of the comprehension check, conceptual learning, 1:1 monitoring and feedback, problem solving and wrong answer notes, and making learning planner and monitoring. In this process, the coach assists the students to focus on the performance. Detailed flows of the process for the interaction between the coach and learners, and consulting process with students and parents are shown in Figure 1. Detailed contents of learning management of the process are shown in the Table 1.
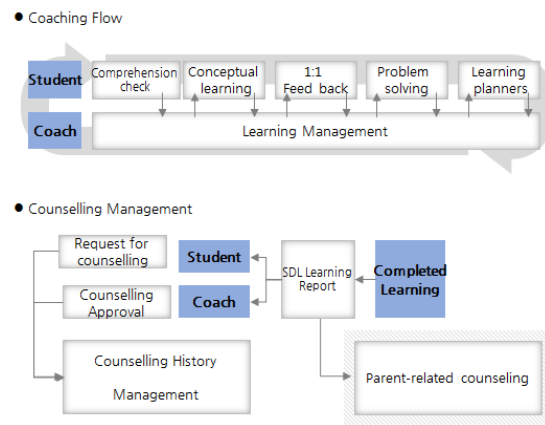

Figure 1. SDL coaching process

Table 1. Detailed contents of coaching programs.

Division	Detailed contents	Coaching managements
Compre-hension check	· Background knowledge checking : Checking on the background knowledge and the predictions of the contents that will be treated in the tables of contents of the textbook · Differentiating the contents that is already known and that is needed to be known	Observing the performance level of students and feedback
Concep-tual learning	· Checking the aims of the lessons : apprehending the core contents of the chapter · Acquisition of information : careful reading and underlining on the important part · Organizing the meta-cognitive training notes · Sentence reconstitution, use of code & make, schematization · The coach prepares the 2~3 required questions on the learning contents	Observing the performance level of students and feedback
1:1 Feed back	· Coaching order of students : After the self-learning, 1:1 feedback in order · Checking the text book/workbook / Managing the habits and attitudes	Checking the learning contents and feedback

Problem solving and wrong answer notes	· Problem solving based on the understanding of the learned contents · Solving uncertain problems with their own material and human resources · Analyzing the wrong answers with wrong answer notes	Observing the performance level of students and feedback
Making learning planners and monitoring	· Making learning planners : about the learning processed today and learning process in this week. · Writing the opinion of the coach / planning / supplements · Making the portfolio in order	Monitoring the contents of the planners and feedback

METHODS

Participants

This study adopted one-group pre-posttest experimental design for examining the effects of a self-directed learning coaching program on meta-cognitive and time management ability of learners. Eighty-six students who volunteered to participate in the SDL coaching program at C Youth Center were selected for study sample. Participants' individual characteristics were presented in the table 2.

Table 2. Participants individual characteristics

Characteristics		frequency	Percent(%)
Elementary school	5th grade	19	22.1
	6th grade	24	27.9
Middle school	1st grade	23	26.7
	2nd grade	12	14.0
	3rd grade	8	9.3
Gender	Boy	52	60.5
	Girl	34	39.5
Total		86	100

Procedure

Pre-test

The self-directed learning diagnostic test was used to analyse the students' traits and characteristics and to apply them for individual coaching. The test was developed and normalized for the Korean elementary, middle, and high school students by the CK research center of S University(Choi et al., 2017). The subtests for meta-cognitive ability and time management ability of the test were utilized in the study. The compo-

nents of them are shown in the Table 3. The pre-test was administered one week earlier than the program beginning by online, at the end of March, 2017. The test took approximately 40 to 50 minutes.

Table 3. Components of Meta-cognitive and Time Management Ability Subtest

Category	Factor	Contents
Meta-cognitive ability	Planning	Ability to consider appropriate strategies and information processing
	Monitoring	Ability to monitor self-attention and evaluate performance
	Regulation	Ability to regulate one's cognitive strategies when it is inappropriate and slow down cognitive processing speed in solving a difficult problem.
Time management ability	Time management	Ability to organize study time, spending time appropriate, making and atmosphere of studying, and finding a time/environment to improve attention.

SDL Coaching Program Operation

The SDL coaching program was administered from April 3, 2017 to December 2, 2017. The subjects participated in the program, twice in a week at a length of 80 minutes for each coaching time. The numbers of the students assigned to a coach were less than five, in order to ensure the effectiveness of the program.

Post-test

The post-test was administered with the same items as the pre-test and by online a week before the program ended.

Data analysis

Descriptive statistics (i.e., frequency, percentile, mean, standard deviation) and paired t-test were conducted for the analysis by using SPSS Win 24.0 version. The significance level for the t-test result was set at .05.

RESULTS AND DISCUSSION

Differences in the meta-cognitive ability

The paired t-test comparing scores of pre- and post-test was conducted to examine the development in the participants' meta-cognitive ability after the SDL coaching program application. The mean score of participants' meta-cognitive ability was changed from 69.91 to 72.42 and the difference was significant statistically($p<.05$), as shown in the Table 4.

Table 4. Mean difference of meta-cognitive ability

Category	test	N	M	SD	t	p
meta-cognitive ability	Pre	86	69.61	12.21	-2.558	.012*
	Post	86	72.42	13.39		
Planning	Pre	86	67.44	14.59	-2.310	.023*
	Post	86	70.87	15.50		
Monitoring	Pre	86	72.62	14.87	-1.568	.121
	Post	86	74.94	16.24		
Regulation	Pre	86	68.78	12.69	-2.217	.029*
	Post	86	71.45	13.13		

*p <.05

All sub-factors of meta-cognitive ability (i.e., planning, monitoring, regulation) showed increases in the mean scores, but the differences were statistically significant in planning and regulation, not in monitoring.

These results demonstrated that the SDL coaching program has positive effect to improve participants' meta-cognitive ability for the following reasons.

First, the SDL coaching program was designed to monitor participants' background knowledge and ability of guessing the studying contents before the actual study session was started. Furthermore, the planning factor that helps to choose effective strategies and information processing for goal achievement could be improved by the process of making up for the participants' weakness through face-to-face individualized coaching.

Second, the regulation factor could be increased because the program provide the participants with experiences to check their notes, to make problem solving notes and wrong answer notes, and to explain about the contents to others. These activities would lead to the accumulation of the experiences of checking their own cognitive strategies and sometimes the experiences of slowing down their cognitive processing speed when faced with difficult problems. Eventually, they lead to the improvement of the regulative ability, which is the sub-factor of meta-cognitive ability.

However, there was no significant difference in the monitoring factor. This result seems to show that the students tended to depend on the feedback of the coach in the monitoring of their own understanding, rather than monitoring by themselves. In the future research, the program would be revised with more activities that could make the students monitor their own understanding by themselves and we may expect better results.

Differences in time management ability

The paired t-test comparing scores of pre- and post-test was also conducted to examine the development in the participants' time management ability.

Table 5. Mean difference of time management ability

Category	test	N	M	SD	t	p
Time management ability	Pre	86	64.01	15.30	-2.258	.027*
	Post	86	67.62	16.12		

*p <.05

The mean score of participants' time management ability was changed from 64.01 to 67.62 and the difference was significant statistically($p<.05$), as shown in the Table 5.

These results demonstrated that the SDL coaching program has positive effects in improving the participants' time management ability. The program let the participants make a planner and monitoring their studying plan for every week. Through this process, they might have tried to organize study time for next week, spend time appropriately, develop good atmosphere for studying for themselves, and finally the ability to find fit time and environment to improve the attention could be increased.

CONCLUSION AND SUGGESTION

The purpose of this study was to examine the effects of a SDL coaching programs developed on the basis of the SMMIS model for the meta-cognitive and behavioral regulative abilities of elementary and middle school students. With the 86 elementary and middle school students participated in the program of C Youth Training Center in Seoul, the study compared the pre- and post-test score of meta-cognitive and time management abilities. The conclusion and implication of the study are as follows.

First, the SMMIS model based SDL coaching program increased the meta-cognitive ability of elementary and middle school students. However, the monitoring, a sub-factor of meta-cognitive ability, did not increased. The results imply that supplementing the process that could make the students follow their concentrations and monitoring their comprehension,

are needed and it would make the program more effective.

Second, the SDL coaching program increased the time-management ability of elementary and middle school students. The results suggested that it would be the outcome of the feedback with the coach, which is about the various disturbances, temptations and improvement of the negative learning environment that could appear in the learning situation. It is the outcome of direct intervention of the coach, rather than the results of students' effort by themselves. However, if the activities, that would make the students solve these problems, is supplemented in the future, it would make the program more effective in improving their self-directedness.

In addition, we suggest some future research in the hope with that more systematic and multilateral research would be carried out in this area.

First, because the participation duration of the SDL coaching program was about 8 months, 160 minutes per week, it was not enough to fully train and form new habits. More long-term programs and research on it are needed in the future.

Second, the analysis in this study was subjected to whole classes of the students, rather than each class or school. More researches on specific class or school are needed to examine the effects of SDL program in more specific situations with various curriculum subjects.

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