Association between the Using Goals of Computer and Self-regulated Learning Ability in Primary School Student Focusing on Gender Differences

Eunmo Sung[*]   Sunyoung Huh

National Youth Policy Institute

Korea

The purpose of the present research was to examine the relationship between the using goals of computer and self-regulated learning ability on the gender difference. To accomplish this goal, we have analyzed the data of Korea Children and Youth Panel Survey III which is nationally collected from primary school students, currently on the 6th grade in South Korea. 2,219 samples were used in the study excluding missing samples. The participants were 1167 males (49.5%) and 1052 females (50.5%). The mean age was 13.94 years (SD=.25). As results, female students spent more time on using computer than male students did: (1) the male students' time spent on *Playing game* was significantly larger than that of female students, but (2) on the rest seven using goals of computer including *e-Learning/Information retrieval for learning*, the female students spent significantly more time than the male students did. Also, in terms of the self-regulated learning ability, using computer for *e-Learning/Information retrieval for learning* itself gave significantly positive effects on both male and female students' self-regulated learning ability. On the other hand, *Playing game* gave significantly negative effects on both. Based on the results, some strategies were suggested on the proper use of computer for learning.

Keywords : using goals of computer, self-regulated learning ability, computer use, gender differences

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[*] National Youth Policy Institute
    ieunmo@gmail.com

Introduction

The computer has been rapidly making a tremendous impact throughout our society so that it is possible to be called the IT evolution. Over the past few years, the computer integrating multi-technology has been penetrated our daily lives by its usage in workplace, learning, communicating, and making social relationship, and it is continuously creating the various kinds of computer usage in our life. At the center of this flow of change, there is youth who adapts this change and uses this new media. According to Korea Internet and Security Agency (2009), the rate of internet use of youth between 12~19 years old was 99.9%, which is close to 100%. For Youth living in the digital era, computer is a media which lets them to access and collect the desired information. Also, it is the integral media which is considered to be the part of youth's life.

Computer which has become a part of youth's life influences on youth's emotional, social, physical and cognitive development. The influence of computer is related to both quantitative and qualitative variables (Epstein, 2012; Jang & Kim, 2008; Park & Kim, 2005; Wang, Luo, Luo, Gao, & Kong, 2012). In quantitative on computer, greater time on the computer might be associated with negative impact for adolescent such as neck-shoulder pain, back pain, lower grad, less seeping, lower self-esteem and so on. In qualitative on computer, the impacts of computer use have been shown in inconsistence previous results. For instance, playing computer game have not only positive impacts such as improving cognitive skills (i.e. as abstraction, attention, concentration, coordination and reasoning skills), social skill(collaboration, relationship), physical skill (hand-eye coordination, and fine motor skills), emotional development(their personalities and self-confidence) (Cunningham, 1994 ; Greenfield, 1999), but also negative impacts such as increasing children's violent behavior, decreasing academic achievement, sense of self-control, self-esteem, and social ability (Fileni, 1988; Roe & Muijs, 1998). Moreover, those influences are differently shown by the gender. Generally, boys are

much time, more motivated, successful, enthusiastic, and addicted to the computer or playing computer game than girls did (Chou & Tsai, 2005; Greenfield, 1983; Mitchell, 1985; Vekiri & Chronaki, 2008).

Recently, the use of computer and internet for learning has been increasing because the computer is providing multi-tools for learning tasks such as writing, drawing, calculating, recording and so on as well as varieties of contents such as e-Book materials, instructional movie clips, instructional mp3, power point lessons, and so on. According to the previous study, learning with computer has positive effect for learner's academic achievement (Kubey, Lavin, & Barrow, 2001). On the other hand, using computer for playing game or internet has negative effect for learner's academic achievement. One of the reasons is that computer use would be affecting the student' self-regulated learning ability because learning computer is based on learner's autonomy. In short, self-regulated learning ability is related to the using goal of computer as why student use the computer.

There are most of the previous studies focus on the relationship between playing computer game (or internet) by gender and self-regulated learning. There are many using goals of computer such as entertainment (i.e. listening to music, watching movie clips), seeking and sharing information, social activities (i.e. chatting, e-mailing, comment replying, and blogging), learning, and so on (Chou & Tsai, 2007). However, there is not clear answer for which kinds of the using goals of computer are relatively affecting learner's self-regulated learning ability. Also, are there differences on the using goals of computer by gender? There is inconsistence result whether the using goal of computer has gender differences or not.

Objective

The purpose of this study is to determine the relationship between the using goals of computer and learner's self-regulated learning ability such as accomplishment value, goal oriented tendency, behavior control, and learning time

management by gender. The two major research questions are as follows;

(1) Is there any gender difference on the using goals of computer?

(2) What is the influence of the using goals of computer on the learner's self-regulated learning ability by gender?

To accomplish this goal, we have investigated and analyzed the data of 2010 Korea Child and Youth Panel Survey III that was a nationally representative, and longitudinal questionnaire was given to elementary school students who were on the 6th grade in South Korea. The result of the present study would be able to provide a detailed guidance of using computer properly for learner's learning.

The gender issues in computer use

Among the studies of variables which have an effect on the computer use, the studies of gender differences show that the differences occurred in the learner's using goals of computer. Kim (2009) reported that female students' beginning level of using computer for learning was high and gently decreased by grading up. On the other hand, male students' using computer for playing games showed nonlinear increase. Kim (2010), also, reported that male students used computer more than female students did. Specifically, male students' major using goal of computer was for playing games, while female students' was for learning.

Self-regulated learning ability and the computer use

Self-regulated learning is the process of learner's setting the learning goal, planning, checking, and controlling the learning process, and evaluating the result himself (Zimmerman, 1990). Considering the definition and the factors of self-regulated learning, self-regulated learning ability is related to self-control that is related to the internet and game addiction when the student is using the computer

according to previous studies. Regarding this result, Seo and Lim (2012) examined the relationships among the computer use, self-control, self-respect aggression, and internet game addiction. They reported that the higher the addiction level showed, the more aggression showed up and the lower the self-control and self-respect showed. Based on this result, the using computer for learning is related to self-regulated learning ability. Similarly, Hahn and Kim (2006) examined the relationship between the level of internet addiction (i.e. game, learning, surfing, chatting) and the self-control, self-regulated learning ability, and academic achievement. As a result, students on the higher level of internet addiction showed lower self-regulated learning ability and both self-control and academic achievement were low as well.

Method

Data Collection

In order to address this goal, we have analyzed the data of 2010 Korean Child and Youth Panel Survey III that was nationally collected from primary school students who is currently on the 6th grade in South Korea. In this panel study, the sample group, a stratified clustered sample design was used, randomly selected 2,378 primary school students in 7 cities and 9 provinces in South Korea. Within the sample group, 2,219 samples were used in the study excluding missing samples. The participants were 1167 males (49.5%) and 1052 females (50.5%). The mean age was 13.94 years (SD=.25), range from 13 to 15 years old.

Materials

The paper-based materials, in order to analyze the panel survey, consisted of a

participant questionnaire, the using goal of computer questionnaire, and self-regulated learning ability scale. A participant questionnaire solicited demographic information concerning the adolescence's age, gender, location, and year in school.

The using goal of computer questionnaire developed by Lee, Kim, Oh, Kim, & Kim (2003) consisted of 8 rating items such as *e-Learning/Information retrieval for learning, Information retrieval except for learning, Playing game, Chatting, e-mail, Community activity, Individual homepage activity*, and *Writing a comment*. The adolescents were asked to rate on a 4-point scale (with *frequently use=4, occasionally use=3, rarely use=2, never use=1*) the level of frequency with which they used their computer for each item. The reliability coefficient obtained by Chronbach's alpha was .76, which indicates suitable reliability.

The self-regulated learning ability scale, which originally created by Yang (2000), was revised by Kim (2006) by reconstructing the factor of the self-regulated learning ability scale. The scale consisted of 18 items in 4 categories such as accomplishment value (7 items), goal oriented tendency(2 items), behavior control(5 items), and learning time management(4 items) that participants were asked to use on a 4-point Likert scale (with *strongly agree=4, agree=3, disagree=2, and strongly disagree=1*) to rate their level of agreement with statements such as "*I think that the knowledge, which is learning at school, is very important to me.*", "*I usually plan the learning schedule to study efficiently.*", and "*I like learning something although I make an enormous effort.*" The reliability coefficient obtained by Cronbach's alpha was .88, which indicates strongly suitable reliability.

Data Analysis

The collected data was analyzed to examine the association of the using goal of computer and self-regulated learning ability according to gender. The statistic techniques were employed an independent t-test, correlation analysis, and multiple

regression analysis. The analyses were conducted in three phases. The first phase involved comparing the using goal of computer, self-regulated learning ability on gender differences with using independent-samples t-test, including effect size of Cohen's *d* (Cohen, 1988). In the second phase, the data were tested multi-collinearity in order to conduct multiple-regression identifying the strength of association within the using goal of computer as independent variables on self-regulated learning ability, including correlation (<.8)(Grewal, Cote, & Baumgartner, 2004) as well as tolerance (>.01), and variance inflation factor(VIF) (<10) (Belsley, Kuh, & Welsch, 1980; Neter, Wasserman, & Kutner, 1990; O'Brien, 2007). Then finally, multi-regression was performed with stepwise method to identify the priority predict variable on dependence variable including a test of linearity using the stepwise method to identify the priority of independent variables, which was the using goal of computer. To analyze the data, SPSS 18.0 was employed.

Result

Gender differences on the using goal of computer and self-regulated learning ability

A preliminary issue concern was whether the primary school students differed in gender with the using goal of computer. Table 1 shows not only the mean ratings and standard deviations, but also the results of the t-test on gender differences including Cohen's effect size. As shown in Table 1, the using goal of computer for *Playing game* (M=3.02, SD=.98) was highest rates. On the other hand, *e-mail* (M=1.87, SD=.92) was lowest rates for using the computer. In gender, there were significant differences in gender of the 8 using goals of computer at the level of p<.05. Female student used computer more than male students on *e-Learning/*

Table 1. Mean (and standard deviation) and T-value for Gender on the Using Goal of Computer by Independent-samples T-test

The using the goal of computer	Gender	N	Mean	S.D	*t*	*d*
e-Learning/ Information retrieval for learning	Male	1112	2.82	0.90	-3.902**	.16
	Female	964	2.96	0.82		
	Total	2076	2.88	0.87		
Information retrieval except for learning	Male	1109	2.72	0.94	-8.263**	.36
	Female	964	3.04	0.86		
	Total	2073	2.87	0.92		
Playing game	Male	1111	3.39	0.81	19.932**	.89
	Female	964	2.59	0.99		
	Total	2075	3.02	0.98		
Chatting	Male	1108	2.24	1.08	-5.438**	.23
	Female	964	2.49	1.07		
	Total	2072	2.36	1.08		
e-mail	Male	1110	1.81	0.92	-3.059**	.13
	Female	963	1.93	0.91		
	Total	2073	1.87	0.92		
Community activity	Male	1111	2.02	1.04	-5.280**	.23
	Female	963	2.26	1.07		
	Total	2074	2.13	1.06		
Individual homepage activity	Male	1110	1.89	1.02	-10.755**	.48
	Female	964	2.39	1.08		
	Total	2074	2.12	1.07		
Writing a comment	Male	1112	2.29	1.09	-6.486**	.28
	Female	962	2.60	1.08		
	Total	2074	2.43	1.10		

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

Information retrieval for learning(t=-3.902, $p<.01$, d=.16), *Information retrieval except for learning*(t=-8.263, $p<.01$, d=.36), *Chatting*(t=-5.438, $p<.01$, d=.23), *e-mail*(t=-3.059, $p<.01$, d=.13), *Community activity*(t=-5.280, $p<.01$, d=.23), *Individual homepage activity*(t=-10.755, $p<.01$, d=.48), and *Writing a comment*(t=-6.486, $p<.01$, d=.28). Male student used computer more than female students on *Playing game*(t=19.932, $p<.01$,

d=.89). The effect size ranged from d=.13 to d=89. The effect size in *Playing game* was very large (d=.89), which means male student primarily using the computer than female. The effect size in *Individual homepage activity*, also, was medium (d=.48), which means female student primarily using computer than male.

In the second place, there was analyzed gender difference on self-regulated learning ability. Table 2 shows not only the mean ratings and standard deviations, but also the results of the t-test on gender differences including Cohen's effect size. As shown in Table 2, mean score of self-regulated learning ability of primary student in South Korea was 2.63 (SD=.50). In sub-domain, accomplishment value was highest score (M=3.12, SD=.58) and behavior control was lowest score (M=1.91, SD=.47) in self-regulated learning ability. On the whole, mean score of male students (M=2.66, SD= 0.52) was higher than female students(M=2.60, SD=.50). In sub-domains, mean score of learning time management was that

Table 2. Mean (and standard deviation) and T-value for Gender on Self-regulated Learning Ability by Independent-samples T-test

Domain	gender	N	M	S.D.	t	d
Accomplishment value	Male	1167	3.12	0.60	.367	-
	Female	1052	3.11	0.56		
	Total	2,219	3.12	0.58		
Goal oriented tendency	Male	1167	2.96	0.74	6.100**	.26
	Female	1052	2.77	0.72		
	Total	2,219	2.87	0.73		
Behavior control	Male	1167	1.93	.49	2.938**	.11
	Female	1052	1.88	.44		
	Total	2,219	1.91	0.47		
Learning time management	Male	1167	2.64	0.70	-.393	-
	Female	1052	2.65	0.68		
	Total	2,219	2.65	0.69		
Total	Male	1167	2.66	0.52	2.921*	.12
	Female	1052	2.60	0.47		
	Total	2,219	2.63	0.50		

* p<.05, ** p<.01

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female student was higher than male students. Means scores of accomplishment value, goal oriented tendency, and behavior control were that male student was higher than female students. There was significant differences in gender of self-regulated learning ability, $t=2.921$, $p<.01$, $d=.12$. In sub-domains, there were significant differences in gender of goal oriented tendency ($t=6.100$, $p<.01$, $d=.26$), and behavior control ($t=2.938$, $p<.01$, $d=.11$).

Regression analysis of self-regulated learning ability on the using goals of computer

The primary issue in this study was whether using goals of computer were able to predict self-regulated learning ability. To address this aim, we have conducted stepwise regression analysis based on the ten using goals of computer with self-regulated learning ability as the dependent measures. First of all, we diagnosed multi-collinearity with correlation coefficient, tolerance, and variance inflation

Table 3. Correlation among the Ten Using Goal of Computer as Independent Variables

Variables	1	2	3	4	5	6	7	8
1. e-Learning/ Information retrieval for learning	1	.247**	-.136**	.013	.125**	.102**	.086**	.088**
2. Information retrieval except for learning		1	.039	.318**	.293**	.342**	.327**	.361**
3. Playing game			1	.211**	.058**	.080**	.025	.106**
4. Chatting				1	.475**	.421**	.530**	.507**
5. e-mail					1	.502**	.422**	.383**
6. Community activity						1	.553**	.551**
7. Individual homepage activity							1	.559**
8. Writing a comment								1

factors (VIF) in order to perform multiple regressions. Examined was the correlations among the ten using goals of computer based on two-tailed tests with p<.05. There was a significant positive correlation among most of the ten using goals of computer, ranging from r=-.136 to r=.559 excluding 2 correlations, which were significant, in Table 3. In addition, as a result of tolerance and variance inflation factors (VIF), tolerance ranged from .802 to .959(>.01) and the variance inflation factor (VIF) ranged from .042 to 1.247(<10). Overall, the indicator of multi-collinearity showed that there was no multi-collinearity problem to perform multiple regressions with the eight using goals of mobile phones as the independent variables.

For the further examination on the relation between the ten using goals of computer and self-regulated learning ability of primary school student, the multiple regressions was conducted by using the stepwise method based on the ten using goals of computer with self-regulated learning ability of primary school student by gender, as summarized in Table 4.

As show in Table 4, In self-regulated learning ability as the dependent variable, using goals of computer were significant predictor variables, $F(5, 2049)=57.926$, p<.01, R2=.124, adj. R2=.122. Especially, *e-Learning/Information retrieval for learning* (β=.301, t=14.246, p<.01), and e-mail (β=.120, t=5.265, p<.01) were significantly positive predictor variables for students' self-regulated learning ability. Meanwhile, *Playing game* (β=-.079, t=-2.767, p<.01) and *Writing a comment* (β=-.049, t=-2.121, p<.05) were significantly negative predictor variables for students' self-regulated learning ability.

In gender differences, male student's using goals of computer were significant predictor variables for self-regulated learning ability, $F(3, 1095)=71.679$, p<.01, R2=.164, adj. R2=.162. Especially, *e-Learning/Information retrieval for learning* (β=.324, t=11.454, p<.01), and e-mail (β=.137 t=4.885, p<.01) were significantly positive predictor variables for male students' self-regulated learning ability. However, *Playing game* (β=-.131, t=-4.680, p<.01) was significantly negative predictor variables.

Table 4. Stepwise Multiple Regression Models of Self-regulated Learning Ability Based on the Using Goal of Computer by Gender

Dependent variable	Gender	Using goal of computer	N	R^2 (adj. R^2)	F	B	β	t
Self-regulated learning ability	Total	e-Learning/Information retrieval for learning	2054	.124 (.122)	57.926**	.172	.301	14.246**
		e-mail				.065	.120	5.265**
		Playing game				-.040	-.079	-3.652**
		Writing a comment				-.022	-.049	-2.121*
	Male	e-Learning/Information retrieval for learning	1098	.164 (.162)	71.679**	.186	.324	11.454**
		e-mail				.077	.137	4.885**
		Playing game				-.084	-.131	-4.680**
	Female	e-Learning/Information retrieval for learning	956	.097 (.094)	34.013**	.148	.259	8.336**
		e-mail				.060	.116	3.714**
		Playing game				-.049	-.102	-3.283**
Accomplishment value	Total	e-Learning/Information retrieval for learning	2054	.093 (.092)	70.153**	.180	.281	13.111**
		e-mail				.040	.062	2.932**
		Playing game				-.030	-.050	-2.359*
	Male	e-Learning/Information retrieval for learning	1098	.112 (.111)	69.463**	.207	.311	10.778**
		e-mail				.054	.083	2.874**
	Female	e-Learning/Information retrieval for learning	956	.072 (.070)	37.057**	.172	.250	7.972**
		Playing game				-.043	-.076	-2.438*
Goal oriented tendency	Total	e-Learning/Information retrieval for learning	2054	.077 (.075)	34.154**	.198	.233	10.779**
		e-mail				.080	099	4.145**
		Playing game				-.057	-.075	-3.392**
		Individual homepage activity				-.048	-.070	-2.967**
	Male	e-Learning/Information retrieval for learning	1098	.124 (.121)	28.954**	.213	.263	9.045**
		Playing game				-.136	-.150	-5.244**
		e-mail				.088	.110	3.783**
	Female	e-Learning/Information retrieval for learning	956	.067 (.064)	22.812**	.169	.190	6.033**
		Playing game				-.069	-.131	-4.129**
		e-mail				.078	.098	3.094**

Table 4. Stepwise Multiple Regression Models of Self-regulated Learning Ability Based on the Using Goal of Computer by Gender (continue)

Dependent variable	Gender	Using goal of computer	N	R^2 (adj. R^2)	F	B	β	t
Behavior control	Total	e-Learning/Information retrieval for learning	2054	.041 (.039)	21.942**	.089	.165	7.568**
		e-mail				.031	.061	2.698**
		Individual homepage activity				.023	.052	2.172*
	Male	e-Learning/Information retrieval for learning	1098	.073 (.069)	21.443**	.117	.216	7.349**
		Individual homepage activity				.036	.075	2.208*
		Chatting				.030	.066	1.964
	Female	e-Learning/Information retrieval for learning	956	.021 (.019)	10.096**	.058	.108	3.348**
		e-mail				.040	.083	2.574**
Learning time management	Total	e-Learning/Information retrieval for learning	2054	.125 (.123)	48.969**	.210	.264	12.493**
		e-mail				.089	.118	5.008**
		Playing game				-.093	-.132	-6.063**
		Individual homepage activity				.050	.077	2.979**
		Writing a comment				-.044	-.069	-2.672**
	Male	e-Learning/Information retrieval for learning	1098	.169 (.166)	44.600**	.211	.273	9.618**
		Playing game				-.155	-.179	-6.341**
		Individual homepage activity				.101	.147	4.362**
		e-mail				.087	.114	3.562**
		Writing a comment				-.043	-.068	-2.062*
	Female	e-Learning/Information retrieval for learning	956	.100 (.095)	21.161**	.214	.256	8.108**
		e-mail				.080	.106	3.031**
		Playing game				-.088	-.127	-3.874**
		Chatting				.058	.091	2.443*
		Information retrieval except for learning				-.053	-.066	-2.011*

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

Also, female's using goals of computer were significant predictor variables for their self-regulated learning ability, $F(3, 952)=34.013$, $p<.01$, R2=.097, adj. R2=.094. Especially, *e-Learning/Information retrieval for learning* ($\beta=.259$, t=8.336, p<.01), and

e-mail (β=.116 t=3.714, p<.01) were significantly positive predictor variables for female students' self-regulated learning ability. However, *Playing game* (β=-.102, t=-3.283, p<.01) was significantly negative predictor variables.

In detail, we have conducted multiple-regression with the sub-variables of self-regulated learning ability (i.e. accomplishment value, goal oriented tendency, behavior control, and learning time management) on the using goals of computer by gender.

In accomplishment value, using goals of computer were significant predictor variables, F(3, 2051)=70.153, p<.01, R2=.093, adj. R2=.092. *e-Learning/Information retrieval for learning* and *e-mail* were significantly positive predictor variables, but *Playing game* was significantly negative predictor variables for students' accomplishment value. In gender differences, male student's using goals of computer were significant predictor variables for self-regulated learning ability, F(2, 1096)=69.463, p<.01, R2=.112, adj. R2=.111. *e-Learning/Information retrieval for learning*, and *e-mail* were significantly positive predictor variables for male students' accomplishment value. Female's using goals of computer were significant predictor variables for theirs accomplishment value, F(2, 954)=37.057, p<.01, R2=.072, adj. R2=.070. *e-Learning/Information retrieval for learning* was significantly positive predictor variables, but *Playing game* was significantly negative predictor variables for female students.

In goal oriented tendency, using goals of computer were significant predictor variables, F(5, 2049)=34.154, p<.01, R2=.077, adj. R2=.075. *e-Learning/Information retrieval for learning*, and *e-mail* were significantly positive predictor variables, but *Playing game* and Individual homepage activity were significantly negative predictor variables students' goal oriented tendency. In gender differences, male student's using goals of computer were significant predictor variables for goal oriented tendency, F(5, 1093)=28.954, p<.01, R2=.124, adj. R2=.121. *e-Learning/Information retrieval for learning* and *e-mail* were significantly positive predictor variables, but *Playing game* was significant predictor variables for male's goal oriented tendency.

Female's using goals of computer were significant predictor variables for their goal oriented tendency, $F(3, 953)=22.812$, $p<.01$, $R^2=.067$, adj. $R^2=.064$. *e-Learning/ Information retrieval for learning* and *e-mail* were significantly positive predictor variables, but *Playing game* was significant predictor variables for female's goal oriented tendency

In behavior control, using goals of computer were significant predictor variables, $F(4, 2050)=21.942$, $p<.01$, $R^2=.041$, adj. $R^2=.039$. *e-Learning/Information retrieval for learning*, *e-mail*, and *Individual homepage activity* were significantly positive predictor variables for students' behavior control. In gender differences, male student's using goals of computer were significant predictor variables for behavior control, $F(3, 109)=21.443$, $p<.01$, $R^2=.073$, adj. $R^2=.069$. *e-Learning/Information retrieval for learning*, *Individual homepage activity*, and *Chatting* in male students, and *e-Learning/Information retrieval for learning* and *e-mail* in female student were significantly positive predictor variables for students' behavior control.

In learning time management, using goals of computer were significant predictor variables, $F(6, 2048)=48.969$, $p<.01$, $R^2=.125$, adj. $R^2=.123$. *e-Learning/Information retrieval for learning*, *e-mail*, and *Individual homepage activity* were significantly positive predictor variable, but *Playing game* and *Writing a comment* were significantly negative predictor variables for students' learning time management. In gender differences, male student's using goals of computer were significant predictor variables for learning time management, $F(5, 1093)=44.600$, $p<.01$, $R^2=.169$, adj. $R^2=.166$. *e-Learning/Information retrieval for learning*, *Individual homepage activity*, and *e-mail* were significantly positive predictor variables, but *Playing game* and *Writing a comment* were significantly negative predictor variables for male students' learning time management, $F(5, 951)=21.161$, $p<.01$, $R^2=.100$, adj. $R^2=.095$. *e-Learning/ Information retrieval for learning*, *e-mail*, and *Chatting* were significantly positive predictor variables, but *Playing game* and *Information retrieval except for learning* were significantly negative predictor variables for female students.

Conclusion

The present study was to investigate how gender difference and the using goals of computer affect the adolescent's self-regulated learning ability.

The result of the study reveals that (1) 6th graders used computers mostly for *Playing game*, (2) second highest amount of time using computers was for studying, and (3) next was for *Information retrieval except for learning*. Also, this study found that the adolescent differ in gender with each using goal of computer. The male students' each time spent on *Playing game* was significantly larger than that of female students, but on the rest seven goals of the computer use, the female students spent more time than the male students did. That is, over all, the amount of time the female students spent on using computer was significantly more than that of male students.

It is interesting that the result of the present study does not support the previous researches. According to the researches, researchers report that male students use computer more than female students while this study found out that female students spend more time using computer than male students did. However, it is possible to say that in the case of using computer for *Playing game*, the result that male students spend more time than female students do supports the previous researches.

Next, the meaningful result is that the self-regulated learning ability is shown differently by gender and the using goals of computer. Using computer for *e-Learning/Information retrieval for learning* and *e-mail* gives positive effect, but for *Playing game, Writing a comment*, and so on gives negative effect on self-regulated learning ability. Gender difference is also shown among the using goals of computer. Using computer for *e-Learning/Information retrieval for learning* and *e-mail* affects positively on both male and female student's self-regulated learning ability. However, in terms of using computer for *Playing game*, the effect is negative for both male and female student.

To sum up, female students use computer more for *e-Learning/Information retrieval for learning,* but using computer for *e-Learning/Information retrieval for learning* itself gives significantly positive effects on both male and female student's self-regulated learning ability. On the other hand, male students spend more time using computers for *Playing game*, but the *Playing game* itself gives significantly negative effects on self-regulated learning ability.

Meanwhile, in terms of the learning time management aspect which can be the major variable of self-regulated learning ability, the more time spent on *e-learning/information retrieval for learning* gives the more positive effects. On the contrary, male student' *Writing a comment* has a negative effect because the time spent on using computer eventually takes away the time for study, as female students' using computers for *Information retrieval except for learning* does.

The findings of this study suggest the strategies on the proper use of computer as follows.

First, the time spent on using computer for *Playing game* should be reduced intentionally. The effort on decreasing time *Playing game* needs to be put by both parents and students because playing games tend to be caused by the addiction problem. Particularly for 6th graders, parents' role is important because primary school students are mostly affected by parents. For this reason, it is necessary to provide the education program of proper computer usage for parents. In fact, it is not easy to reduce the students' time using computer regardless of learning considering the culture and society in the era. Thus, instead of forcing them not to use it, providing the strategy on the proper use of computer is recommended. For this, it is necessary to adjust the amount of time using computer by confirming the detailed number of hours of computer using time. One good strategy is to reduce the time using computer except for their studying. The first requirement to carry it out is to be aware that *Writing a comment* on the websites, *Playing game*, and *Information retrieval except for learning* give negative effect on their self-regulated learning ability. Also, another important point is to digitize and record the amount of time spent

using computer in order to measure it specifically.

Second, being aware of using computers for *Playing game* gives negative effect on both male and female student, it is necessary to implement the game addiction prevention program for both of them. In previous reviews report that male students tend to be more easily addicted to exciting and aggressive games than the female students did (Augner, & Hacker, 2012). However, this study shows that *Playing game* affected female students negatively as well. Differ to the previous studies focused on the male student's game addiction, this study points out the necessity of female students' game addiction prevention at the same time. In particular, the critical period of youth which has the highest possibility of addiction to become a social problem is the age of 10~12 (Livingsone & Haddon, 2008; Sung, 2013). Considering this result, it is essential to provide game addiction prevention program for both male and female students on 3rd ~6th grade.

This study is subject to limitations of deciding research questions, and selecting methodology due to this study's utilizing the data from '2010 Korean Child and Youth Panel Research III'. Therefore, for further research, it would be necessary to investigate the difference among the purposes of using computer according to computer dependency, and the effect of dependency level on self-regulated learning ability and academic achievement with qualitative methodology.

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Eunmo SUNG

Ph.D in Educational Technology, Seoul National University.

Associate Research Fellow, National Youth Policy Institute.
Interests: Instructional System Design, Learning Strategy, Mobile Based
Learning, Visual Competencies, Human Performance Technology
E-mail: ieunmo@gmail.com

Sunyoung HUH

Master's Degree in Educational Technology, Seoul National University.

Research Assistant, National Youth Policy Institute.

Interests: Educational Technology, Instructional design, Competencies
E-mail: sunyounghuh@snu.ac.kr