

Mediation Effect of Motivation and Immersion for Learning in the Relation between Tutor and Learning Effectiveness of Cyber Home Learning

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ABSTRACT

The main purpose of cyber home education in public sector is to promote public education and restrain expensive private education expenses. The primary purpose of this study is to explore the effects of motivation, immersion and tutor on the effectiveness of cyber home learning. The variables of motivation, immersion and tutor participation were incorporated in this study as follows: ① tutor participation was classed as a single independent variable, which has interaction and also effects passion; ② motivation and ③ immersion were classed as two mediatory variables: motivation which include relevance and confidence; and immersion which includes attention and controllability. ④ learning effect was classed as a single dependent variable of learning influence factor which has learning attitude and learning satisfaction.

The results show that a tutor had a direct influence on the effects of the learners' study but motivation and immersion had an indirect influence on the effects of learners' study independently. Based on these findings a tutor should provide motivation and immersion with various learning methods and contents for learners to get maximum benefits from cyber home learning.

Key words : Meditation Effect, Motivation, Immersion, Tutor, Cyber Home Learning

1. Introduction and Purpose of Study

With the wide spread adoption of PCs, development of the Internet and high speed broadband networks, the

traditional education system has evolved[1]. In accordance with the changes in the educational paradigm based on information technology communication, e-learning can lead learners with self-directed learning in cyber space. E-learning is the learningsystem that can meet learners' need anytime, anywhere without any restriction of time and place. The attempt at facilitating e-learning in elementary and secondary schools may be understood as the implementation for life-long learning system, as well as

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the usage of various instruction methods. Recently government directed cyber home learning has been put in use in public education to extend the way of an education era[3]. Kim [11]commented that cyber home learning is expected to overcome the restrictions of conventional teaching-learning method of our education system, to actively cope with the rapid changes in this knowledge creation society, and to create a new learning culture.

Rha[21] states in his study that cyber education can develop differently from traditional face-to-face education and that this difference may be divided into two parts. Firstly, knowledge in traditional education is delivered verbally between the teacher and student, whereas knowledge in cyber education based on the Internet can be delivered not only in verbal, but also in nonverbal means with images, moving pictures, the three dimensional space, simulation etc. Secondly, with seeing education methods in cyber education objectively, cyber education provide the opportunity to achieve the objectification and scientifitization of education. Because the interaction between the teacher and the student in Cyber education can be observed objectively and be recorded based on fact.

Nonetheless, foremost of all, the development of cyber education should be driven by its educational effect. Jung et al. [6]synthesized and analysed the previous studies on cyber education and found that outcomes of cyber education in comparison with the traditional education is in no way inferior, and they argued that it could be a viable alternative form to the traditional education. Hiltz[4]insists that cyber education can be effectively used to improve the ability to utilize information technology in the information society of the 21st century.

KERIS[12] remarked that formal education put every effort to utilize cyber education along with the more traditional methods. They said one of the strategies of activating cyber education in recent public education is cyber home learning. Kim[11] reports that the cyber home learning is expected to overcome the limitations of the traditional teaching-learning method in our education system, to cope with the rapid changes in the knowledge creative society, and to contribute to

establish a new learning culture.

Yoon[25] found that the most influential factors in e-learners' satisfaction were motivation and interaction. He examined 500 people in his study, including high school students, university students, employees and soldiers. He pointed out that the importance of the role of the tutor(instructor) was in encouraging students to keep going on the learning activities(motivation), solving problems with them (interaction) and managing their learning process periodically through the evaluation. Therefore the primary purpose of this study is to explore effects of tutor, motivation and immersion on the effectiveness of cyber home learning.

2. Background of the Cyber Home Learning

2.1 Concept and characteristics of the cyber home learning

Rapid advances in telecommunication technology has driven the development in all fields of learning. In particular, the use of cyber space and e-learning drives out the traditional teaching-learning problems, instead it is suggested as an alternative with the innovated learning environment[9].

Jung[7] defined cyber home learning as a new learning system in a virtual space or a cyber space which is used with ICT. She emphasized that the system provides education in a cyber space based on the computer network particularly.

In accordance with [16], cyber home learning is an online-learning-service which supports learners to do their learning activities for themselves through the Internet.

Lee et al.[17] and Lim[18] defined cyber learning as the education that is accomplished only through the Internet with a virtual space existing as a practical space on the Internet. He distinguished between cyber learning and virtual education. With this definition, cyber learning requires various considerations in order to differentiate a cyber learning system from a face-to-face learning environment. The cyber learning system is to be influenced by the characteristics of

'cyber space' whereas the face-to-face education system is influenced by the 'real space'. For instance, it should develop its own teaching-learning method, strategies of instructional design, administrative and organizational considerations that are not the same as the face-to-face educational environment. Jung et al[8] remarked that cyber-home-learning is a type of education using internet based on computer communication technology.

With all these discussions, cyber learning can be defined as an individual learning system with interaction between the learner, the computer, and the management with the content all conducted in cyber space.

Overall as mentioned above, the cyber learning system promotes the learner's participation and motivation actively. Furthermore, as the system provides a space to make the learners express their own thoughts to others, to exchange their ideas to one another, and to cooperate with others, they themselves can explore knowledge information and build up their own curriculum and learning experience with their own thought, decision making, and choice in their learning activities. For cyber home learning is a learner-centered education service which provides the learners with tailored-made teaching, stream self-learning content with the Internet and it also provides them with the environment that the learners work by themselves. In addition it supports the structural learning management with the cyber classes and the system can influence a lot to the learners' attitude.

2.2 Mediatory Variables

2.2.1 Tutor

A systematic learning management system is needed to set up cyber home learning. The effect of speeding up the progress of the learner's learning is insufficient if there are not enough cyber teachers to supervise the individuals learning progress[5].

Particularly, those who are insufficient in self-directed learning ability find it difficult in achieving their goals using only self-regulated content

and system. So they need a device to manage the learners' progress which can be done by the participation of their parents and teachers[14].

KERIS[13], therefore, insists that the success of cyber home learning depends on the passion and interaction of the tutors.

2.2.2 Motivation

Motivation, in the perspective of public school education, promotes learners' various class-learning activities and evokes the desire of class-learning activities[16]. Brophy[2] explains motivation as the way in which learners perceive their learning activities. If a subject views their activities as meaningful and worthy, they then start to maintain their learning with the view of achieving the goal, and set the direction of learning behaviour. Subordinate concepts of motivation in learning consist of two factors: relevance which influence learners to achieve requirements and aims; and confidence which helps them feel and believe their success with self-control. Therefore to get motivation requires two factors: the first is to align learners' aims and learning contents to be closely related, the second learners must have confidence in their study.

2.2.3 Immersion

Immersion experience gives learners the feeling of success, positive attitude and self-esteem simultaneously. It is a psychological mechanism that stimulates them to achieve better learning effect that make learners experience some kind of positive emotions like pleasantness.

Skadberg & Kimmel[23] reported that immersion experience in online learning environment can lead learners to improve their progress and to change the attitude and behaviour in learning.

Kim[10] clarified that an immersion experience in learning is a psychological factor which influences the effectiveness of the learning process. Also Shin[22] remarks that immersion in the activities and performing tasks shows the most potential ability and feels subjective satisfaction and happiness simultaneously.

Such immersion of constructing factor consists of two parameters: one of them is the factor which

captures learners' interest and concentrated attention supporting to cause curiosity in learning, and the other one is the control factor which can manage and rule over themselves.

2.2.4 Learning Effect

The effect of cyber home learning includes the cognitive domain such as the learner's achievement and the affective domain such as the learner's attitude and satisfaction, interaction and self-regulated learning ability.

These are used to evaluate the effectiveness of cyber education. Therefore, immersion, motivation and tutor have been selected as the factors which influence the effectiveness of learning within the particular system of cyber home learning in this study. That is, if learners immerse their learning process with interest and curiosity and their goals and learning contents are closely related with confidence, they will get more immersion. And tutors' passion and inter-relation between learners and tutors will improve effects of learning.

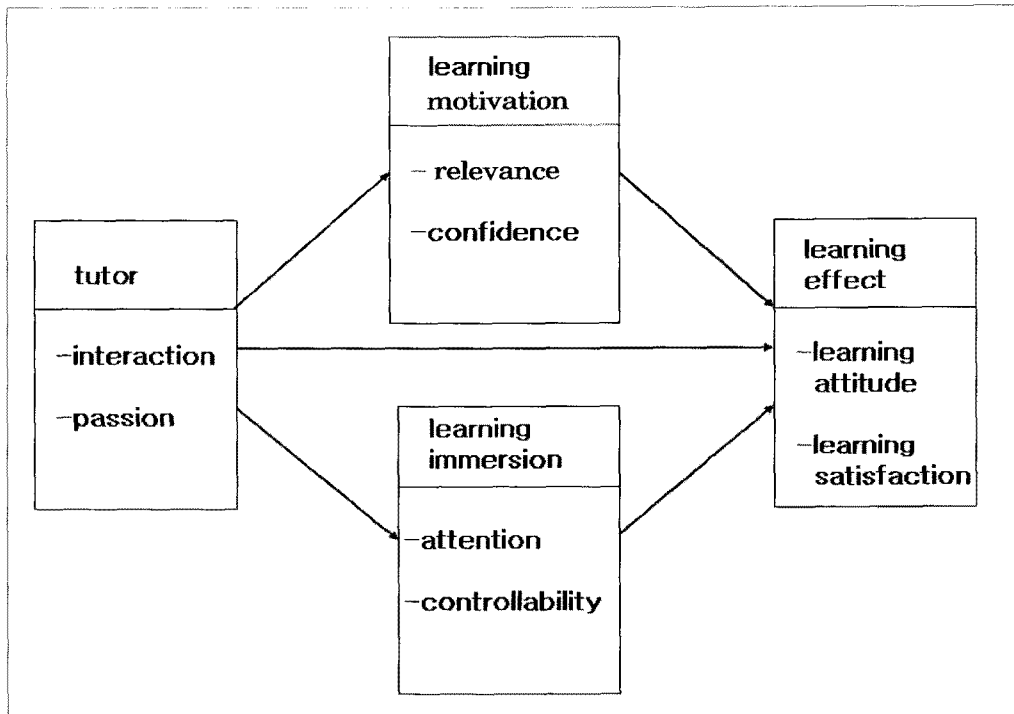
3. Research Method

3.1 Research model and hypothesis

In this study the hypothetical model <Figure 1> has been set up to test the relation among the latent variables according to the suggested research hypothesis. The model shows in a structural equation model once the influence on the learning effect of the cyber home learning is analyzed with a structural form. To select the best fitted model which explains the most fitness of the relation of each variable, the model consists of the mediation effect of motivation and immersion for learning.

The model is in a parallel form in which the variables of motivation and immersion affect on the learning effect independently. In this research model the motivation and immersion of the learners take the same role of mediation with the same level. For it is assumed that both of them will influence on the dependent variable of learning effect.

Based on former research, motivation and immersion



<Figure 1> Research Model of Learning Effects

were chosen as mediation parameters which might influence effects of the learners. Then a hypothetical model that explains the relation of the mediation variables and the learning effect was set up. The hypotheses in this study are as follows:

Hypothesis 1: The tutor of cyber home learning will positively influence the learning effect.

Hypothesis 2: The tutor of cyber home learning will positively influence the learning motivation.

Hypothesis 3: The tutor of cyber home learning will positively influence the learning immersion.

Hypothesis 4: The learners' motivation of the cyber home learning will positively influence the learning effect.

Hypothesis 5: The learners' immersion of the cyber home learning will positively influence the learning effect.

Hypothesis 6: The tutor of the cyber home learning will indirectly influence the learning effect with the mediation parameter of the learning motivation(a paralleled mediation model).

Hypothesis 7: The tutor of the cyber home learning will indirectly influence the learning effect with the mediation parameter of the learning immersion(a paralleled mediation model).

3.2 Participants

3.2.1 Pilot research

A draft questionnaire was prepared to collect the data to test the reliability and validity prior to the main research. Data was collected twice; the first data set collection was held on the 14th of June 2007 with 37

second year students of a middle school, where 13 out of 37 were valid; the second data set collection was held on the 26th and the 27th of June 2007 with each class of the same school's first and second year students, where all 14 were valid. In these two pilot studies, Overall 27 questionnaires were collected and the final one was made from them with necessary corrections.

3.2.2 Main research

Among 300 students participating in cyber home learning, there were 245 middle school students who answered the questionnaire through the Internet from the 19th of May to 7th of June 2008. The valid questionnaires were 230 and the valid rate was 93.8%. However, those who had answered for the pre-research questionnaire were restricted not permitted to take part.

3.3 Reliability and Validity of Instrument

The instrument used in this study had verified its reliability and validity in the previous studies. Each item of questionnaire was extracted from the background theory[11][19][20][24] and modified to fit in this study. <Table 1> shows the loadings and Cronbach's (α) coefficient analysed with SPSS 13.0. The reliability coefficients are as follows attention 0.661, controllability 0.612, relevance 0.630, confidence 0.644, interaction 0.583, passion 0.616, attitude 0.574, satisfaction 0.599, and all of them are all more than 0.500<Table 1>. It implies that all of them have reliability.

<Table 1> Validity and Reliability of Instrument

Theoretical variables	Measurement variables	Items	Factor loadings	Cronbach's α
Immersion	Attention	4	.582	.661
	Controllability	4	.759	.612
Motivation	Relevance	4	.810	.630
	Confidence	4	.844	.644
Tutor	Interaction	4	.880	.583
	Passion	4	.914	.616
Learning effect	Attitude	3	.634	.574
	Satisfaction	5	.697	.599

3.4 Confirmatory Factor Analysis in the instrument

The result of confirmatory factor analysis(CFA) as shown in the <Table 2> and <Table 3> used GFI(Goodness-of-Fit Index; where ≥ 0.90 appropriate), AGFI(Adjusted Goodness-of-Fit Index; where ≥ 0.90 appropriate), RMSR(Root Mean Square Residual; ≤ 2.90 appropriate), p-value regarding χ^2 (where

≥ 0.05 appropriate) to extract the most fittings of items at each stage.

The results of the measured model of the latent variables in this study are shown in <Table 2> and <Table 3>. It can be ascertained that the fitness of the measured model in this study is granted in accordance with the result of the fitness of model.

<Table 2> Coefficient of latent variable on measurement variable

Latent variable	Measurement variable	Nonstandardized coefficient	Standardized coefficient	S.E.	C.R.	P
Tutor	Interaction	1.0	1.05	-	-	-
	Passion	0.61	0.61	0.16	3.70	0.00
Motivation	Relevance	1.0	0.34	-	-	-
	Confidence	2.88	1.01	1.39	2.08	0.04
Immersion	Attention	1.0	0.80	-	-	-
	Controllability	0.71	0.63	0.23	3.15	0.00
Learning effect	Attitude	1.0	0.75	-	-	-
	Satisfaction	0.96	0.72	0.17	5.82	0.00

<Table 3> Fitness of measurement model

model	χ^2	FD	p	$\chi^2/d.f.$	RMR	GFI	AGFI	NFI	TLI	CFI
Hypothetical model	22.46	14	0.07	1.60	0.03	0.98	0.94	0.95	0.96	0.98

3.5 Method of Data Analysis

The data collected in this study was analyzed with SPSS 13.0 and AMOS 5.0. and the results are as follows:

First, to estimate the model in this study, it was assumed that all variables follow multivariate normal distribution. Maximum likelihood estimation method that calculates the factor loadings was used. To calculate the factor loadings, Lestwise was chosen, and all of cases that had missing data were excluded from the computation.

Second, to identify the reliability of instrument used in this study, exploratory factor analysis on the measurement variable for the learning effect was carried on and reliability was analysed.

Third, to analyse the relation between the factors

that effect to the learning effect, factor analysis of the learning immersion, motivation and tutor was carried out and extracted 2 factors respectively. To see the relation among them, correlation coefficients were calculated and then correlation analysis was executed.

Fourth, confirmatory factor analysis(CFA) was carried out with AMOS 5.0 to test the validity of the measurement model on the learning effect.

Fifth, to test the validity of theoretical model suggested in the hypothesis, structural equation modeling(SEM) was used with AMOS 5.0. Maximum likelihood estimate method was used to test the model in this study.

To verify the hypothesis, the structural model shown in <Figure 2> was set up. When this parallel mediator model was mediated by the learners' motivation and immersion chosen as mediator variables, tutor variable

may be influenced.

Sixth, in the result influencing on the learning effect of tutor, the affect of path mediated with the effect of the learning motivation and immersion was simultaneously analysed, and the significance of mediator effect was evaluated.

4. Results of Study

4.1 Correlation coefficient of variables

To analyse the factors which influence the effectiveness of learning in users of cyber home learning, correlation analysis was conducted. The sub-factor of variables are two factors of learning motivation (relevance and confidence), two of immersion(attention and controllability) and two of tutor(interaction and passion). The dependent variable of learning effect has both attitude and satisfaction attributes. Results of the correlation analysis are shown in <Table 4>.

4.2 Structure Equation Model to verify mediator effect test

The research model was analysed with structure

equation model(SEM) to verify mediator effect, then the way of parameter estimation was Maximum Likelihood Estimation Method.

4.2.1 Evaluation of Parallel Mediator Model

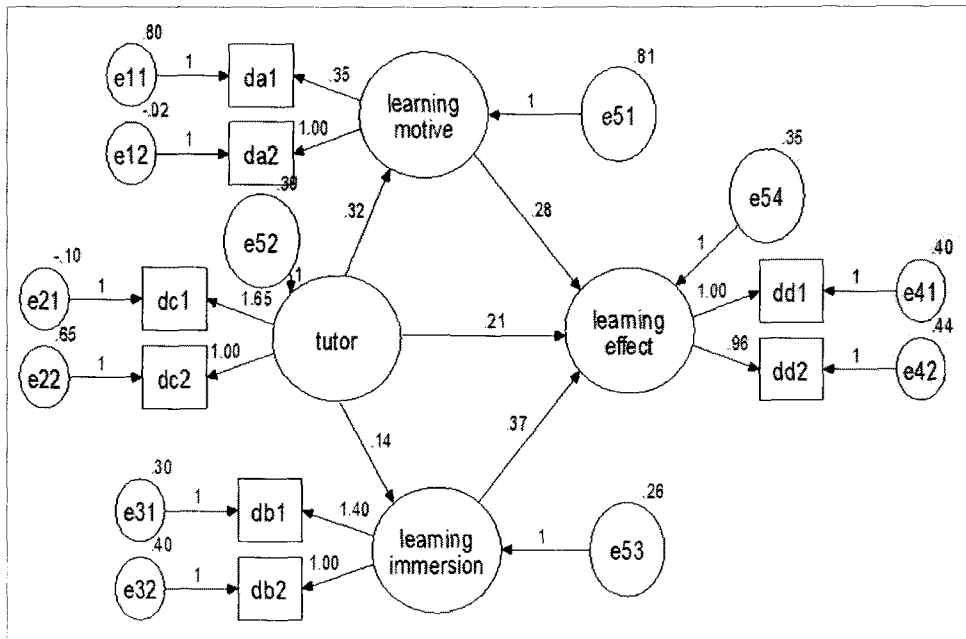
The Parallel Mediator Model in this study is the mediator process. It illustrates that learning motivation and learning immersion influences the effectiveness of learning independently in the same level. The overall fitness coefficient of the model is shown in <Table 4>. The fitness coefficient GFI, AGFI, NFI, TLI all show good fitness with which are greater than standard 0.90. Even CFI which should be greater than 0.95 to be a good fitness meets and exceeds this standard. RMSEA which explains the complexity of the model with the concept that smaller is better appears to be in good fitness with less than 0.05. For the overall fitness of the model can be concluded as good with the parameter estimation within the model and the Squared Multiple Correlation(SMC) between the latent variable and the measurement variable are confirmed. The non-standardized coefficient(B) and Critical Region(CR) were examined to verify the hypothesis after analysis on the parameter estimation of the model. The analysis of model effectiveness was verified with the (β).

<Table 4> Correlation of Variables

Factors	A	B	C	D	E	F	G	H
A	1							
B	.342	1						
C	.026	.017	1					
D	-.083	.048	.507	1				
E	.053	.226	.153*	.094	1			
F	.096	.109	.106	.006	.645	1		
G	.128 †	.281 †	.246	.194	.244	.211	1	
H	.092	.334 †	.102	.124	.244	.101	.533	1

A=attention; B=controllability; C=relevance; D=confidence; E=interaction; F=passion; G=learning attitude; H=learning satisfaction

** 0.01 * 0.05



<Figure 2> Results of Parallel Variables Model

<Table 5> Optimal Index of Parallel Mediator Model

Model	χ^2	d.f.	p	$\chi^2/d.f.$	RMR	GFI	AGFI	NFI	TLI	CFI
Model	22.46	14	0.07	1.60	0.03	0.98	0.94	0.95	0.96	0.98

4.2.2 Effects Analysis of Parallel Mediator Model

Significance tests of parameter estimates and mediatory effect were conducted in the process of model development at the same time in parallel

mediatory model applied in groups. <Table 6> shows the results which were put in order suggested Hypotheses.

<Table 6> Effects Analysis of Paths in Model

path	causal effects		
	direct effects	indirect effects	total effects
tutor -> learning motivation	0.32	-	0.32
tutor -> learning immersion	0.14	-	0.14
tutor -> learning effect	0.21	0.14	0.35
learning motivation -> learning effect	0.28	-	0.28
learning immersion -> learning effect	0.37	-	0.37

Path 1: Tutor → Direct path on learning motivation
As the effectiveness of tutor’s role in cyber home learning appeared to be positively influential(0.32) to

motivation, the [Hypothesis 1], “The tutor of cyber home learning for Korean will influence on learning motivation positively”, has been proved.

Path 2: Tutor → Direct path on learning immersion

As the effectiveness of tutor's role in cyber home learning appeared to be positively influential(0.14) to immersion, the [Hypothesis 2], "The tutor of cyber home learning will influence on learning immersion positively", has been proved.

Path 3: Tutor → Direct path of learning effect

As the effectiveness of tutor's role in cyber home learning appeared to be positively influential(0.21) to learning effect, the [Hypothesis 3], "The tutor of cyber home learning for Korean will influence on learning effect positively", has been proved.

Path 4: Learning motivation → Direct path on learning effect

As the effectiveness of learning motivation in cyber home learning appeared to be positively influential(0.28) to learning effect, the [Hypothesis 4], "The learning motivation of cyber home learning will influence on learning effect positively", has been proved.

Path 5: Learning immersion → Direct path on learning effect

As the effectiveness of learning immersion in cyber home learning appeared to be positively influential(0.37) to learning effect, the [Hypothesis 5], "The learning immersion of cyber home learning will influence on learning effect positively", has been proved.

Path 6: Tutor → Learning motivation → Indirect path on learning effect

The effectiveness of tutor's role in cyber home learning appeared to be positively influential(0.32) and the learning motivation of cyber home learning positively influenced learning effect(0.28). Therefore, the [Hypothesis 6], "The tutor of the cyber home learning will indirectly influence the learning effect with the mediation parameter of the learning motivation(a paralleled mediation model).", has been proved.

Path 7: Tutor → Learning immersion → Indirect path on learning effect

The effectiveness of tutor's role in cyber home learning appeared to be influential(0.14) positively and the learning immersion of cyber home learning positively influenced learning effect(0.37). Therefore, the [Hypothesis 7], "The tutor of the cyber home learning will indirectly influence the learning effect

with the mediation parameter of the learning immersion(a paralleled mediation model).", has been proved.

5. Conclusion

5.1 Summary of the study

The main purpose of cyber home education in the public sector is to promote public education and restrain high private education expenses. This study aimed to survey and quantify the real influence of cyber home education. The variables were a Tutor independent variable of interaction and passion, two mediatory variables: Motivation which has relevance and confidence; and Immersion which has attention and controllability. The dependent variable is Learning Effect which has learning attitude and learning satisfaction. With the research model made, both the direct effectiveness of tutor towards learning effect and the indirect effectiveness with the mediator variables of learning motivation and immersion were observed. There were seven hypotheses in this study, and all of them were selected as they influenced positively on learning effect according to the result of analysis of SEM.

The overall result of this study shows that the tutor directly influenced learning effect. Also, they significantly influenced learning effect when learning motivation and learning immersion mediated between tutor and learning effect. As both learning motivation and learning immersion appeared to independently influence learning effect, tutors should support that learners experience well learning motivation and immersion in order to progress the learning effect of cyber home learning.

5.2 Limitations and Suggestions

A few limitations with regard to this study and some suggestions for further studies are as follows:

Firstly, since numbers of cases to generalize the learning effect model developed in this study were not enough, more cases should be collected and verification

of the validity is to be proved in future studies.

Secondly, there could be a possibility to depreciate the representation due to limited numbers of sample. It was difficult to see that 230 cases represent all national middle and high school students. Although the empirical analysis of this study is beyond its power to generalize, it could be useful to find out the influential factors on cyber home learning.

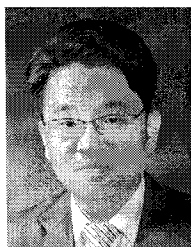
Thirdly, there are a lot of previous studies with regard to cyber home learning, but most of the literature explained either the present state or the expectations or operational method of cyber home learning. As much of the literature analysed with only one factor influencing on cyber home learning, more studies with various factors are needed.

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