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A Study on the Factors Affecting Middle School Students' Korean Language Academic Achievement

: Focusing on Awareness of Reading, Efficacy, Interest, Teacher's Enthusiasm and Multiple Choice Evaluation

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I. Introduction

1. Purpose of research

There are many factors that affect students' academic achievement. Various factors such as basic habits as well as teacher's enthusiasm and ability work in a complex way. Therefore, examining the process of change in teaching-learning activities that affect achievement provides basic data for comprehension learners, enhancing teachers' professionalism, and formulating educational policies.

The purpose of this study is to analyze the influence and structural relationship of various factors surrounding middle school students on academic achievement to enhance the comprehension of learners in the school field and the academic world. Middle school students, learning-related factors, academic achievement, and the process of change, which are the key elements shown in the purpose of the study, are detailed as follows.

First, there is a significance of middle school students as a research subject. Middle school students are a period when abstract and deductive thinking is possible in terms of cognitive development. Piaget defines middle school students as a period in which abstract thinking is possible in terms of cognitive development, and various

information can be synthesized, evaluated, and applied (Ka, 2011, p. 18). Middle school is a time when higher thinking skills develop in earnest.

Achievement in middle school affects higher education and individual careers. Since the academic achievement of middle school students is also related to the responsibility of public education, everyone involved in education, such as teachers, scholars, and policy-making administrators, should pay attention. In this study, middle school students whose higher thinking ability is developing in earnest were targeted and the factors influencing their academic achievement were to be identified.

Second, it is an analysis of learning-related factors. The main interest of this study is the correlation between learning-related factors and academic achievement. There are various factors that affect academic achievement, such as the home environment, the physical environment and interpersonal relationships of the school, and life experiences. Among many factors, cognitive and affective factors have a direct impact on academic achievement, as can be seen from previous studies and teacher's empirical statements. In addition, reading habits and teacher-related factors also have an impact. Therefore, finding the factors that affect academic achievement and identifying the structural relationship with academic achievement can be said to be a prior task to solve the problem of under-achievement or low-achievement.

Third, it is an analysis of achievement as a result of learning. Academic achievement analysis serves as a criterion for determining the validity of the learning process. In order to determine whether the learning process and activities suitable for the learner's characteristics are designed, it is necessary to analyze the academic achievement, which is the learning outcome. The understanding of the relationship between teaching-learning activities and academic achievement and structural characteristics is closely related to the decision of teaching-learning design and education policy and research direction. In particular, it is necessary to consider the fact that the Korean language

academic achievement, which is the focus of this study, has a great impact on overall learning.

Finally, it is about comprehension the process of change. A learner's development can be captured through change. It is also meaningful to identify the characteristics of learners that appear at a specific time through a cross-sectional study. However, identifying the developmental process of individuals or groups through longitudinal studies is meaningful in that the direction and degree of development can be identified, and appropriate educational interventions can be provided and necessary policies can be established based on this.

2. Research question

Do learning factors tend to change over time?

Learning factor are divided into internal and external areas. The internal area refers to the activities that occur inside the learner during the learning process. The external area mainly appears as teacher-student or student-student interaction during class time. It is not easy to grasp the process of change because teaching-learning activities change every moment depending on the situation, regardless of internal and external areas. However, since comprehension the process of changing teaching-learning activities according to the learner's development is necessary to prepare appropriate educational interventions, this study aims to understand how learners' teaching-learning activities change.

What are the factors influencing Korean language academic achievement and their relationship?

This study aims to analyze the achievement of Korean language, considering that listening and speaking, as well as reading and writing, are used as basic tools of learning. The teaching-learning ac-

tivities to be analyzed in this study are learning strategy, self-directed learning, test stress, awareness for teacher's enthusiasm, comprehension, concentration, attitude, teacher-centered and learner-centered class methods, subject efficacy and interest. to be. Among them, factors that can explain the relationship with Korean language academic achievement will be selected and analyzed, and structural relationships will be identified through the latent growth modeling.

II. Background

Teaching and learning activities shown in previous studies include cognitive strategies, meta-cognition strategies, test stress, subject efficacy, subject interest, teacher and teaching methods, evaluation methods, and reading ability. Factors directly related to learners were classified as internal factors, and factors indirectly related to learners were classified as external factors. These factor can be divided into learner's internal and external activities based on the learner. In this chapter, in order to find out the learning factors that affect academic achievement, the teaching-learning activities shown in previous studies organize and the relationship with achievement is analyzed.

Teaching and learning activities shown in previous studies include cognitive strategies, meta-cognition strategies, test stress, subject efficacy, subject interest, teacher and teaching methods, evaluation methods, and reading ability. Factors directly related to learners were classified as internal factors, and factors indirectly related to learners were classified as external factors. These factor can be divided into learner's internal and external activities based on the learner. Learner's internal activities can be divided into cognitive and affective dimensions, and learning strategies and self-directed learning are representative teaching-learning activities at the cognitive level. Learning strategy is a thought process that occurs during the learning process and is basically divided into a cognitive strategy that understands

learning content and a meta-cognitive strategy that applies and structures comprehension content. It affects achievement through learning motivation and self-directed learning (Kim, 2008; Lee, 2019).

Self-directed learning is a form of learning that learners carry out on their own, from setting the aims of the lesson and establishing plans to controlling and checking the learning process and determining whether goals are achieved. Self-directed learning ability is closely related to self-regulation ability. Self-regulation ability, which is an essential ability to perform self-directed learning, achieves learning goals and affects academic achievement (Heo, 2010).

On the affective level, factors related to teaching-learning activities include test stress, subject efficacy, and subject interest. Academic stress negatively affects a sense of efficacy and academic achievement (Lee, 2019). The ability to self-regulate learning that affects academic achievement also appears as a medium of efficacy. If the sense of efficacy is too low, it also appears as anxiety, and learning anxiety appears as a learner's attitude toward the subject (Ham, 2015).

On the other hand, it is necessary to pay attention to the fact that these affective factors combine with cognitive factors such as learning strategies to affect achievement (Lim & Lee, 2019). This is because efficacy and learning strategies may interact and affect academic achievement. Therefore, it is necessary to synthesize cognitive and affective factors and examine achievement based on them.

At the external level, factors related to teaching-learning activities include interaction with teachers and teaching methods. Interaction with teachers appears in the teaching method, and the teaching method affects academic achievement. Depending on the teaching method, the learner's interest and comprehension of the content differ. There is a traditional method in which the teacher plays the central role in delivering the learning content, and a method in which the learner understands the content on his own through various activities. It was found that activity-oriented classes of learners affect cognitive and affective factors, but do not directly affect academic achievement

by subject (Kwon & Kang, 2020). The teacher's teaching method differs depending on whether the instructor or the learner is at the center of content delivery and comprehension. Therefore, rather than judging the superiority and inferiority of the teacher-centered class method and the learner-centered class method, it is reasonable to select a method suitable for the learning content and situation.

Reading activities, a descriptive evaluations, etc. are teaching-learning activities at an external level, and specifically correspond to teaching-learning methods. The purpose of these methods is different. However, they have something in common in that they aim at comprehension and applying learning contents according to learning goals. Through previous studies, it can be seen that reading activities have an effect on academic achievement (Im et al., 2016). Comprehension activities closely related to reading activities have a great influence on learning. This is because most learning is based on comprehension activities through reading.

A descriptive evaluations were found to be related to subject efficacy (Lee, 2018). A descriptive evaluations aims to measure high-order thinking skills through activities that evaluate the process of comprehension questions and solving problems. At the institutional level, identifying the relationship between writing and essay evaluation is meaningful in that it can understand the learner's thinking process and thinking ability and the factors that affect and are affected by it. On the other hand, teachers' emotional support affects learners' subject efficacy, interest, and attitude, and is indirectly related to academic achievement (Kim & Han, 2015). The teacher's emotional support appears as a teacher's daily relationship with the learner or a specific utterance during class, and above all, it is recognized by the students as the teacher's enthusiasm. A teacher's enthusiasm has a positive effect on academic achievement as well as the relationship with learners (Ha & Sim, 2022).

Focusing on teaching-learning activities, the factors that affect academic achievement were investigated. These factors basically in-

clude cognitive and affective factors at the learner's internal level, and teacher and learning method elements at the external learner's level. Basically, all of these factors are closely related to academic achievement. In this study, we first look at the correlation and change trend of all measured data, select factors that can explain academic achievement, and examine the structural relationship.

III. Research Method

The purpose of this study is to use the panel data of the Busan Longitudinal Study of Education to identify the characteristics of the learner group, focusing on teaching-learning activities and Korean language academic achievement. Therefore, the three-year data (2016-2018) of the Busan Education Longitudinal Study P2 (middle school students) will be used. Specifically, the data measured in the areas of teaching-learning activities of students and the data on Korean language academic achievement are analyzed. Considering that the panel data is data from a longitudinal study, we will focus on comprehension factors related to learning and the process of change in academic achievement.

Existing studies that analyze the relationship between learning factors and academic achievement verify the effect of individual activities, so there is a limit to identifying the overall change and the characteristics of the structural relationship. In this study, we analyze the process of change and structural relationship of major factors related to learners, and seek meaningful policy implications through this.

1. Analysis subject

Among the three-year data (2016-2018) of the Busan Education Longitudinal Study P2 (middle school students), the data measured for the purpose of identifying teaching-learning activities are ana-

lyzed. The Busan Education Longitudinal Study has been conducted since 2016, classifying classes by school level, and collecting data by group such as school or class as the sampling unit. In this study, 3067 1st-year middle school students (56 schools) were surveyed annually in 2016, and data from the 1st year to the 3rd year were analyzed. Excluding missing values, the number of cases used in the analysis was 3038, with 1644 male (54.1%) and 1394 female (45.9%).

As for the subject of analysis, only the factors consisting of the same questions were selected from the survey questions related to teaching-learning activities from the 1st to the 3rd year. The factors selected for analysis were learning strategy, self-directed learning, test stress, awareness for teacher's enthusiasm, comprehension, concentration, teacher-centered and learner-centered teaching methods, subject efficacy and interest. In addition, factors related to reading that are not directly related to teaching-learning activities, but are judged to have an impact on learning, were also added to the subject of analysis. Table 1 shows the composition of each factor, the number of items, and reliability.

Table 1. Information by factor

Factor	Question	Reliability
Reading	(excluding textbooks and reference books) 1. Amount of reading per month 2. Average reading hours per week 3. Average newspaper reading time per week 4. Average library hours per week	1st .674 2nd .699 3rd .720
Learning strategy	1. When studying, memorize as many things as possible. 2. Think about whether you can use what you have learned in real life. 3. When I study, I can find out what I did not understand.	1st .790 2nd .727 3rd .708
Self-directed learning	1. I know how to find the information I need. 2. They are curious about things. 3. I know what I want to learn. 4. I take the final responsibility for my studies. 5. You can judge whether your studies are going well or not. 6. I know when to make up for the lacking part of the contents I am studying now.	1st .877 2nd .876 3rd .875

Exam- stress	1. I get nervous when I have a test. 2. I am more nervous right before an exam. 3. During exams, you forget what you know. 4. Worries about the results after the exam is over. 5. If I could avoid the test, I would like to avoid it. 6. I wish there would be no such thing as a test.	1st .821 2nd .816 3rd .813
Teacher enthusiasm	1. Teachers have high morale. 2. Teachers work with enthusiasm. 3. Teachers are proud of our school.	1st .841 2nd .859 3rd .891
Comprehension	Class comprehension level by subject	
Concentration	Class concentration time by subject	
Attitude	1. Pay attention in class. 2. Actively participate in class. 3. Complete homework. 4. Study in advance what will be taught in class. 5. Review what you learned in class.	1st .843 2nd .828 3rd .794
Teaching ability	1. The Korean language teacher has a lot of knowledge about the subject in charge. 2. Korean language teachers teach easily and well. 3. The Korean language teacher checks if you understand well during class. 4. Korean language teachers teach according to the student level.	1st .917 2nd .911 3rd .913
Class method (Instructor-centered)	1. The Korean language teacher delivers the contents of the textbook through explanations. 2. The Korean language teacher prepares and presents materials necessary for class in advance. 3. The Korean language teacher asks if the students understand the content of the class.	1st .896 2nd .887 3rd .907
Class method (Learner-centered)	1. The Korean language teacher guides the students to come to a conclusion by gathering opinions on a given topic. 2. Korean language teachers help students find their own class goals. 3. Korean language teachers help students solve their own problems. 4. Students collect and investigate data on their own to solve problems on their own. 5. Students form small groups to solve learning tasks together.	1st .924 2nd .931 3rd .930
Efficacy	1. I am confident in comprehension difficult content in Korean language textbooks. 2. I can do Korean language class assignments well. 3. I am confident that I can skillfully use what I have learned in Korean language class.	1st .911 2nd .895 3rd .910
Interest	1. When studying Korean, read not only textbooks and reference books, but also other related books. 2. When I study Korean, I can concentrate well. 3. I have a lot of questions about Korean, so I want to study more.	1st .839 2nd .813 3rd .811

All factors to be analyzed were presented on a 5-point scale. Among them, class comprehension was presented as 20% or less 1, 21-40% 2, 41-60% 3, 61-80% 4, 81% or more 5, and class concentration was 0-10 minutes 1, 11-20 minutes 2, 21 to 30 minutes 3, 31 to 40 minutes 4, and 41 minutes or more 5. The rest were presented as 1 'not at all', 2 'not so', 3 'normal', 4 'agree', and 5 'very much so'.

In addition, Korean language scores were analyzed to determine academic achievement. The Korean language score was the result of an academic achievement evaluation conducted separately for a longitudinal study. The validity of the evaluation questions was secured through the process of presentation and review. Descriptive item scoring secured reliability through multiple scoring and consultation process.

2. Analysis method

In order to achieve the purpose of the study, the latent growth modeling for each variable is applied. The latent growth modeling is a model that can identify the degree of change in factors and the relationship between them (Kim et al., 2009), and is an appropriate analysis tool for analyzing longitudinal study data. Basic analysis examines descriptive statistical results and correlations between variables, learning strategy, self-directed learning, exam stress, awareness for teacher's enthusiasm, comprehension, concentration, class attitude, teacher-centered and learner-centered teaching methods In addition, we will examine the degree of change according to the subject efficacy and interest over the years.

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tation process.

After setting up a model that explains the structural relationship between factors, the research model will be verified through model fit. After verifying the research model, we will analyze the relationship between the factors that affect Korean language academic achievement, and identify the relationship between the variables and structural characteristics.

For model fit, chi-square, TLI, CFI, and RMSEA will be applied. Chi-square has been used since the early structural equations, but since the null hypothesis is strict and it is affected by samples, we want to use TLI, CFI, and RMSEA along with chi-square. When TLI and CFI are .90 or more and RMSEA is .05 or less, it means that the fit of the model is good.

Missing data, which occur according to the characteristics of panel data, may cause problems in the fit and reliability of the model. To solve this problem, it is necessary to delete missing data or to validate missing data. In this study, the validation of missing data was conducted in advance. SPSS 21 was used for descriptive statistics and correlation analysis, and Amos 21 was used for the latent growth modeling analysis to examine the degree of change by factor and its effect on Korean language academic achievement.

IV. Results

1. Descriptive statistics

In order to identify the trend of increase and decrease by year, the average and standard deviation were examined. Therefore, we try to understand the change process and interpret the results for each factor of teaching and learning activities over the past 3 years. The reason for examining the trend of change by factor through descriptive statistics is that it is judged that it is meaningful to examine the

trend of change due to the nature of longitudinal studies. Above all, it was thought that it could give meaningful implications for understanding the growth and development of students. The descriptive statistical data for each factor of reading activity and teaching-learning activities to be analyzed in this study are as follows.

Table 2. Descriptive statistics by factor

Factor (number of questions)	Period	Average	SD
Learning strategy	1st	11.112	2.484
	2nd	11.381	2.320
	3rd	11.312	2.385
Self-directed learning	1st	23.774	4.435
	2nd	24.014	4.215
	3rd	23.834	4.306
Exam-stress	1st	20.625	5.692
	2nd	20.779	5.552
	3rd	20.514	5.524
Teacher enthusiasm	1st	12.191	2.388
	2nd	11.905	2.411
	3rd	11.747	2.498
Comprehension	1st	4.10	1.020
	2nd	4.05	1.016
	3rd	4.09	1.039
Concentration	1st	3.90	.990
	2nd	3.87	.937
	3rd	3.87	.908
Attitude	1st	18.190	4.291
	2nd	18.070	4.274
	3rd	18.100	4.384

Teaching ability	1st	17.790	2.909
	2nd	17.454	3.007
	3rd	17.397	3.048
Class method (Instructor-centered)	1st	13.389	2.194
	2nd	13.218	2.164
	3rd	13.196	2.250
Class method (Learner-centered)	1st	21.084	4.069
	2nd	20.818	4.049
	3rd	20.927	4.076
Efficacy	1st	15.332	3.764
	2nd	15.190	3.593
	3rd	15.352	3.667
Interest	1st	10.898	3.033
	2nd	10.666	2.933
	3rd	10.567	3.006
Reading	1st	8.822	3.247
	2nd	7.948	3.199
	3rd	7.937	3.142
Multiple choice score	1st	**45.850**	**16.936**
	2nd	**45.418**	**19.710**
	3rd	**44.346**	**19.313**
Descriptive evaluation score	1st	6.103	5.377
	2nd	11.570	6.053
	3rd	12.852	7.353
Korean language score (Total)	1st	**51.955**	**20.522**
	2nd	**56.989**	**23.326**
	3rd	**57.196**	**24.131**

In Table 2, factors that continuously increase or decrease are test stress, teacher's enthusiasm, teacher's teaching ability, instructor-centered teaching method, subject interest, reading activity, multiple choice score, descriptive score, and Korean language score. The descriptive score and Korean language score, which represent academic achievement, showed a continuous increase. This means that the Korean language academic achievement of middle school students in the Busan is continuously increasing. However, it is worth noting that the multiple-choice score decreased slightly, but the descriptive score increased sharply. In other words, the change patterns in the multiple-choice score and the descriptive score are different.

Teacher's enthusiasm and teaching ability, instructor-centered teaching method, awareness of subject interests, and reading activity time were found to be continuously lowered. Among the teaching-learning activity items, there are 4 items related to teachers, and the average of 3 items among them is continuously decreasing. This means that the awareness is changing negatively over time for teacher. Further discussion is needed as to whether it is correct to view this fact as awareness itself, or to relate it to the change in level according to the student's growth. In Table 2, it is also worth noting that the average level of subject interest continues to decrease. This is because subject interest is closely related to academic achievement. Further research on the change in subject interest is needed.

In Table 3-5, which analyzed the correlation, the following points can be noted. First, the correlation between the multiple-choice score, the descriptive score, and the Korean language score (Total), which represent Korean language academic achievement, and other factors were found to be very low. This is a result that is far from the general awareness that teaching-learning activities presented in longitudinal studies directly affect academic achievement.

Second, learning strategies and self-directed learning consistently showed a high correlation for 3 years. Considering the fact that it is important to establish and practice learning strategies in self-directed

Table 3. Correlation coefficient: 1st year

	Learning strategy	Self-directed learning	Exam-stress	Teacher enthu-siasm	Compre-hension	Concent-ration	Attitude	Teaching ability	Method (Instructor)	Method (Learner)	Efficacy	Interest	Reading	Multiple choice score	Descrip-tive score	Korean language score
Learning strategy	1															
Self-directed learning	.661**	1														
Exam- stress	-.095**	-.091**	1													
Teacher enthusiasm	.282**	.322**	.012	1												
Comprehension	.456**	.395**	-.103**	.257**	1											
Concentration	.395**	.339**	-.079**	.222**	.577**	1										
Attitude	.440**	.397**	-.062**	.308**	.562**	.654**	1									
Teaching ability	.288**	.321**	-.032	.444**	.371**	.367**	.478**	1								
Method (Instructor)	.305**	.352**	-.013	.442**	.380**	.390**	.494**	.782**	1							
Method (Learner)	.308**	.344**	-.027	.422**	.303**	.327**	.434**	.681**	.722**	1						
Efficacy	.534**	.516**	-.146**	.324**	.600**	.528**	.612**	.470**	.483**	.480**	1					
Interest	.502**	.478**	-.076**	.288**	.441**	.473**	.544**	.389**	.405**	.472**	.716**	1				
Reading	.249**	.266**	-.084**	.147**	.261**	.243**	.227**	.134**	.143**	.149**	.258**	.277**	1			
Multiple choice score	.299**	.232**	-.106**	.186**	.446**	.275**	.276**	.210**	.236**	.136**	.311**	.190**	.237**	1		
Descriptive evaluation score	.265**	.221**	-.099**	.173**	.383**	.254**	.234**	.178**	.194**	.106**	.282**	.155**	.194**	.579**	1	
Korean language score	.316**	.249**	-.113**	.198**	.468**	.294**	.318**	.219**	.247**	.139**	.331**	.197**	.246**	.977**	.740**	1

Table 4. Correlation coefficient: 2nd year

	Learning strategy	Self-directed learning	Exam-stress	Teacher enthu-siasm	Compre-hension	Concent-ration	Attitude	Teaching ability	Method (Instructor)	Method (Learner)	Efficacy	Interest	Reading	Multiple choice score	Descrip-tive score	Korean language score
Learning strategy	1															
Self-directed learning	.633**	1														
Exam- stress	.009	-.018	1													
Teacher enthusiasm	.279**	.349**	.046*	1												
Comprehension	.394**	.358**	-.062**	.204**	1											
Concentration	.310**	.289**	-.048**	.209**	.535**	1										
Attitude	.425**	.428**	-.025	.274**	.518**	.583**	1									
Teaching ability	.273**	.330**	-.018	.447**	.334**	.346**	.400**	1								
Method (Instructor)	.323**	.378**	.031	.459**	.329**	.331**	.424**	.768**	1							
Method (Learner)	.301**	.379**	-.010	.441**	.283**	.292**	.425**	.673**	.725**	1						
Efficacy	.469**	.497**	-.113**	.311**	.580**	.465**	.639**	.485**	.488**	.505**	1					
Interest	.443**	.464**	-.044*	.286**	.408**	.422**	.626**	.390**	.415**	.473**	.681**	1				
Reading	.146**	.177**	-.050**	.108**	.217**	.203**	.274**	.116**	.127**	.123**	.230**	.244**	1			
Multiple choice score	.224**	.199**	-.066**	.131**	.383**	.237**	.233**	.186**	.206**	.103**	.266**	.152**	.257**	1		
Dscriptive evaluation score	.214**	.186**	.006	.153**	.327**	.224**	.224**	.186**	.207**	.141**	.222**	.144**	.171**	.497**	1	
Korean language score	.242**	.216**	-.056**	.154**	.398**	.257**	.255**	.203**	.226**	.126**	.286**	.162**	.259**	.974**	.681**	1

Table 5. Correlation coefficient: 3rd year

	Learning strategy	Self-directed learning	Exam-stress	Teacher enthusi-asm	Compre-hension	Concent-ration	Attitude	Teaching ability	Method (Instructor)	Method (Learner)	Efficacy	Interest	Reading	Multiple choice score	Descrip-tive score	Korean language score
Learning strategy	1															
Self-directed learning	.630**	1														
Exam- stress	.062**	.025	1													
Teacher enthusiasm	.332**	.371**	.082**	1												
Comprehension	.407**	.385**	.011	.215**	1											
Concentration	.319**	.303**	-.011	.226**	.546**	1										
Attitude	.440**	.434**	.053**	.280**	.526**	.605**	1									
Teaching ability	.318**	.386**	.037*	.501**	.344**	.359**	.437**	1								
Method (Instructor)	.334**	.413**	.042*	.492**	.360**	.359**	.406**	.788**	1							
Method (Learner)	.318**	.408**	.049**	.490**	.298**	.301**	.401**	.697**	.759**	1						
Efficacy	.481**	.504**	-.036*	.293**	.579**	.485**	.634**	.458**	.469**	.455**						
Interest	.450**	.452**	.025	.269**	.440**	.446**	.630**	.386**	.374**	.408**	.682**	1				
Reading	.183**	.179**	-.021	.074**	.214**	.207**	.226**	.103**	.115**	.088**	.198**	.203**	1			
Multiple choice score	.242**	.217**	-.023	.121**	.412**	.257**	.220**	.174**	.203**	.105**	.282**	.164**	.209**	1		
Descriptive evaluation score	.200**	.203**	.010	.136**	.354**	.223**	.216**	.168**	.200**	.119**	.241**	.149**	.193**	.545**	1	
Korean language score	.258**	.234**	-.012	.136**	.438**	.276**	.238**	.191**	.224**	.122**	.298**	.171**	.229**	.967**	.742**	1

learning, this can be seen as a natural result.

Third, the correlation between awareness for teaching ability and teaching method was consistently high for 3 years. Also, among teacher-related awareness, it was found that the correlation between teacher's enthusiasm and other teacher-related factors was not high. Taken together, students' awareness that teachers have high teaching ability is related to specific teaching methods rather than teachers' enthusiasm.

Fourth, there was a high correlation between class attitude, subject efficacy, and subject interest. This means that the higher the confidence and interest in the subject, the more actively participating in the class.

Fifth, the correlation between subject efficacy, interest, and learning strategy, which are defining factors, was high only in the 1st year, decreased in the 2nd year, and slightly increased in the 3rd year. The 2nd year corresponds to the 2nd year of middle school, and it is in line with the results of previous studies in that it is a representative period when defining factors such as efficacy and interest decrease.

2. Analysis of no change model and linear change model

In this section, we will use the latent growth modeling (LGM) to examine the changing process of the influence of learning-related factors on middle school students' Korean language achievement. In order to examine the structural relationship between learning-related factors and achievement, non-change model and linear change model analyzes were conducted for the factors of reading activity and the factors for which all 3-year data were presented among the teaching-learning activity factors appearing in the panel data. The results of the no-change model analysis are shown in Table 6.

Table 6. Goodness of fit of the no-change model

Factor	chi square(df)	P	TLI	CFI	RMSEA	Initial value	
						Average	Variance
Learning strategy	22.666(4)	.000	-1.313	.000	.039	11.275***	.155***
Self-directed learning	13.260(4)	.010	5.12	.349	.028	23.878***	.598**
Exam- stress	6.695(4)	.153	.360	.147	.015	20.369***	.566
Teacher enthusiasm	77.808(4)	.000	-.531	.000	.078	11.953***	.230***
Comprehension	8.795(4)	.066	.692	.590	.020	4.080***	.035**
Concentration	42.497(4)	.000	-2.904	.000	.056	3.761***	.022
Attitude	8.566(4)	.073	.736	.648	.019	18.120***	.581**
Teaching ability	36.470(4)	.000	-.745	.000	.052	17.553***	.327
Method (Instructor)	19.224(4)	.001	.394	.192	.035	13.268***	.210***
Method (Learner)	13.806(4)	.008	.654	.539	.028	20.942***	.725***
Efficacy	6.661(4)	.155	.715	.620	.015	15.289***	.376**
Interest	20.604(4)	.000	-.574	.000	.037	10.708***	.292*
Reading	160.409(4)	.000	-8.852	.000	.113	8.220***	.205
Multiple choice score	43.061(4)	.000	.025	.000	.057	45.263***	3.009
Descriptive evaluation score	1900.232(4)	.000	-62.435	.000	.395	9.886***	-2.710***
Korean language score	149.713(4)	.000	-2.070	.000	.110	55.052***	7.749

The no-change model is a model that assumes that the variables measured at each time point of data collection do not change, and the initial mean value and variance can be estimated. To analyze the invariant model, the maximum likelihood method are used as model estimation methods for data with missing values (Kim et al., 2009).

Looking at Table 6, it can be seen that the fit of all factors is not good. It is common for studies using structural equations not to present results with poor model fit. Nevertheless, the reason why the

Table 7. Goodness of fit of the linear change model

Factor	chi square (df)	P	TLI	CFI	RMSEA	Initial value		Change rate	
						Average	Variance	Average	Variance
Learning strategy	10.621(1)	.001	-3.769	.000	.056	11.176***	-.076	.096*	-.021
Self-directed learning	5.179(1)	.023	.119	.706	.037	23.854***	-.009	.023	.459
Exam- stress	2.941(1)	.086	-.844	.385	.025	20.700***	.273	-.060	.663
Teacher enthusiasm	1.592(1)	.207	.951	.984	.014	12.179***	.433	-.221	.491***
Comprehension	4.126(1)	.042	.198	.733	.032	4.085***	.003	-.005	.016
Concentration	9.773(1)	.002	-2.559	.000	.054	3.828***	-.024	-.070	.014
Attitude	.650(1)	.420	1.081	1.000	.000	18.164***	-.015	-.044	.428
Teaching ability	4.595(1)	.032	.227	.742	.034	17.744***	-.084	-.196***	.010
Method (Instructor)	2.469(1)	.116	.766	.922	.022	13.363***	.018	-.096***	.044
Method (Learner)	3.045(1)	.081	.638	.879	.026	21.029***	-.217	-.091	.052
Efficacy	3.695(1)	.055	-.155	.615	.030	15.277***	.407	.013	.346
Interest	1.077(1)	.299	.971	.990	.005	10.875***	.545	-.165	.171
Reading	38.065(1)	.000	-8.338	.000	.110	8.66	-.241	-.428	.153
Multiple choice score	**.593(1)**	**.457**	**1.041**	**1.000**	**.000**	**45.944*** **	**-15.32**	**-.754**	**20.08****
Descriptive evaluation score	243.929(1)	.000	-31.507	.000	.283	6.625***	.891	3.582***	.932
Korean language score	23.891(1)	.000	-.929	.357	.087	52.660***	-12.73	2.637***	32.343*

model fit was not good was because it was judged to be helpful data to understand the growth and development process of middle school students in the Busan and to establish effective policies. It is in the same context that all the results of the suitability analysis of teaching-learning activity factors were presented.

The linear change model is applied when a variable measured at each time point of data collection shows a tendency to increase or decrease. In the descriptive statistics in Table 2, only the average change was examined, but in Table 7, it was verified statistically whether the measured value increased or decreased consistently for each factor. As with the no change model, the maximum likelihood method were used as model estimation methods to analyze the linear change model.

As a result of analyzing the linear change model, it was found that the model fit was good for awareness for teacher's enthusiasm, self-awareness of class attitude, subject interest, and multiple choice score factors. In particular, the multiple-choice score's model fit index was TLI 1.041, CFI 1.000, RMSEA .000, which means that the multiple-choice score changes significantly over time. Therefore, in this study, we intend to conduct a latent growth modeling analysis based on multiple choice scores.

3. Relationship between learning-related factors and multiple choice scores: Latent growth model

1) Unconditional change latent growth modeling analysis result

The multiple choice score linear change model goodness-of-fit index was found to be good. On the other hand, it was confirmed that the goodness-of-fit index of the no-change model was not good. This means that the multiple-choice score data are more suitable for the linear change model than the no change model. The unconditional linear change model of multiple-choice scores is shown in Figure 1.

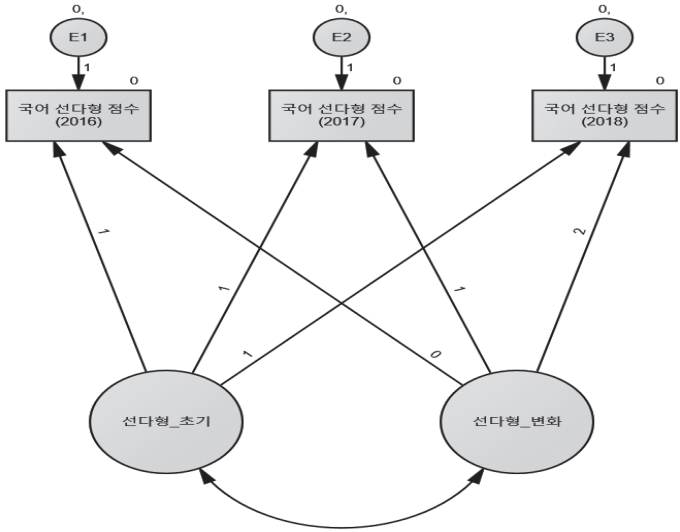

Figure 8. Unconditional linear change model of multiple choice scores

As a result of analyzing the unconditional linear change model of the multiple-choice score, the mean and variance of the initial value were found to be statistically significant at the significance level of .001. This means that there are individual differences in the Korean language multiple-choice scores of middle school students in Busan. The average rate of change was -.754, which was found to decrease over time, but no statistically significant difference was found. The covariance of the relationship between the initial value and the change rate of the Korean language multiple choice score was 3.94. However, no statistically significant difference was found.

Table 8. Linear model estimates of multiple choice scores

Factor	Initial value		Change rate		Covariance
	Average	Variance	Average	Variance	
Korean language multiple choice score	45.944***	-15.32	-.754	20.08**	3.94

2) Condition change latent growth modeling verification result

A research model as shown in Figure 2 was presented to identify factors that affect multiple choice scores among learning-related factors.

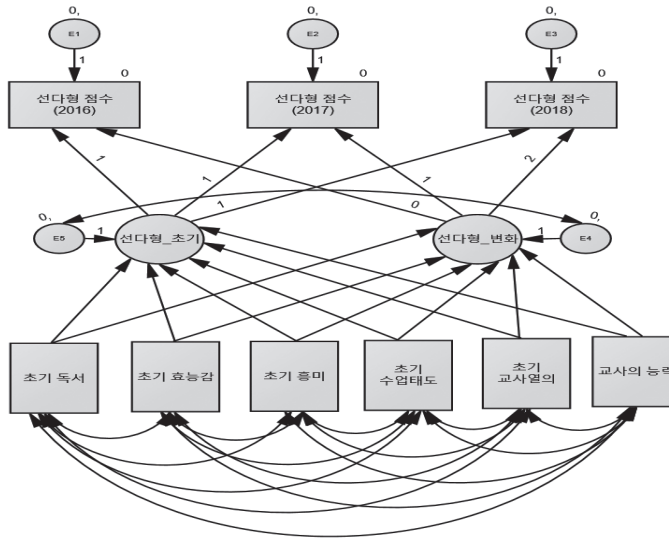

Figure 2. Research model

As a result of the theoretical background and linear change model analysis, the first-year data on efficacy, interest, attitude, and teacher's enthusiasm, which had good model fit indices, were selected as initial data. In addition, as factors influencing academic achievement, the factors examined in the theoretical background were added to determine the suitability of the research model, and the teacher's ability in reading activities was set as additional data. Therefore, a research model was established to show the relationship between reading, efficacy, interest, attitude, enthusiasm, teacher's ability, and Korean multiple choice scores. The results of analyzing the goodness of fit of the research model are shown in Table 9.

Table 9. Goodness of fit of the model

chi square(df)	P	TLI	CFI	RMSEA
66.017(7)	.000	.956	.991	.053

Looking at the goodness of fit of the research model in Table 9, it can be seen that the TLI and CFI values are .09 or higher, respectively, and the RMSEA value is .053. Although the RMSEA value is slightly higher than .05, it can be seen that the model fit is generally good. The parameter estimates of the research model are shown in Figure 3 and Table 10.

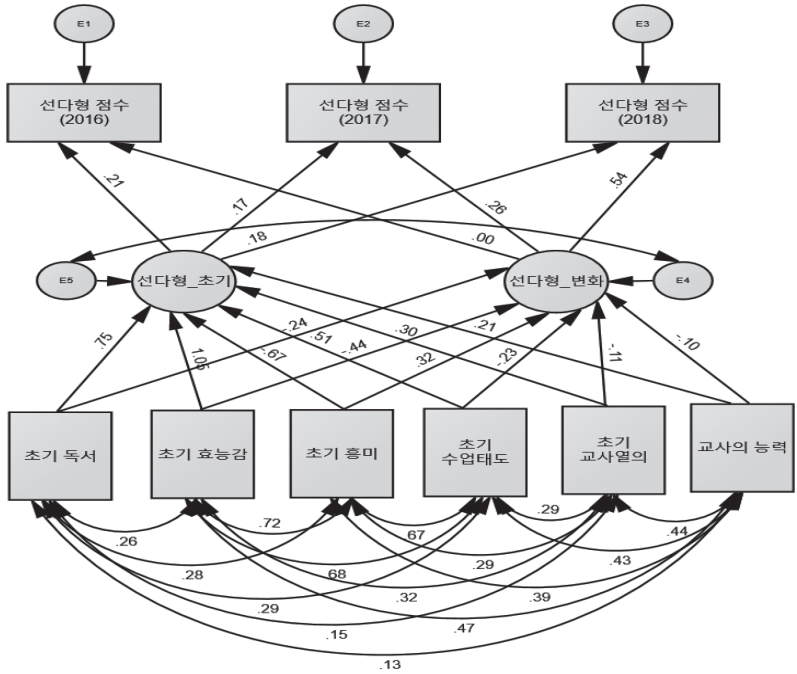

Figure 3. Parameter estimates of the research model (standardization coefficient)

Table 10. Parameter estimates of the research model

			Non-standardization coefficient	Standardization coefficient
Initial reading	→	Korea language multiple choice score_initial	.790***	.747
Initial reading	→	Korea language multiple choice score_change	-.389***	-240
Initial effficacy	→	Korea language multiple choice score_initial	.957***	1.049
Initial efficacy	→	Korea language multiple choice score_change	-.610***	-.436
Initial interest	→	Korea language multiple choice score_initial	.551***	.317
Initial interest	→	Korea language multiple choice score_change	-.753***	-.665
Initial attitude	→	Korea language multiple choice score_initial	-.286***	-.234
Initial attitude	→	Korea language multiple choice score_change	.411***	.514
Initial Teacher enthusiasm	→	Korea language multiple choice score_initial	.430***	.299
Initial Teacher enthusiasm	→	Korea language multiple choice score_change	-.243*	-.110
Initial Teaching ability	→	Korea language multiple choice score_initial	-1.85	-.102
Initial Teaching ability	→	Korea language multiple choice score_change	.248*	.210

Looking at the parameter estimates in Figure 3 and Table 10, it can be seen that the initial reading activity, that is, the 1st year reading activity, has a statistically significant static effect on the initial Korean language multiple choice score at the significance level of .000. This means that the more reading activities in the 1st year, the higher the initial Korean language multiple choice score. In contrast, the initial reading activity was found to have a statistically significant negative

effect on the Korean language multiple choice change value at the significance level of .000. These results can be examined in relation to the descriptive statistics that the reading activity and multiple choice scores of the 3rd graders decreased compared to the 1st and 2nd graders, and this is also an area that requires additional research in terms of learner development or sociocultural context.

Similarly, the initial efficacy showed a statistically significant value with a non-standardized coefficient of .957 at the significance level of .000. This means that the higher the 1st-year efficacy, the higher the initial Korean language multiple-choice score. Similar to the initial reading, the initial efficacy was found to have a statistically significant but negative effect on the Korean language multiple-choice change value at the significance level of .000. This means that the influence of initial efficacy that affects the Korean multiple choice score decreases over time. Early interest and early class attitude also showed non-standardized coefficients of .551 and .411, respectively, which were statistically significant at the significance level of .000. The higher the initial interest in the subject and the better the subject class attitude, the higher the initial Korean language multiple choice score. On the other hand, at the significance level of .000, the Korean multiple-choice change value was found to have a statistically significant but negative effect. This means that the influence of initial interests and attitudes diminishes over time, and that there are other factors that affect academic achievement as the grade progresses. Therefore, it is necessary to study the affective, cognitive, and socio-cultural factors, rather than interest and attitude.

It can be seen that the initial reading activity, efficacy, interest, and attitude show the same tendency for the Korean language multiple-choice score. It is true that it has a static effect on the initial score, but over time the effect diminishes and the score changes slowly accordingly. Among these factors, it is necessary to pay attention to the fact that all of them, except for reading activity, are learner's internal and defining factors. In other words, it can be seen that it means

that an educational method that can maintain the initial value of the learner's internal factors, among them, the affective factors, is needed. This will be further discussed in the policy discussion.

Like the factors discussed above, the factor in the teacher, which can be regarded as awareness for teacher, has a static effect at a statistically significant level at the initial value and decreases over time. It is necessary to pay attention to the awareness for teacher's teaching ability. It was found that the awareness for the initial teacher's teaching ability did not have a statistically significant effect on the initial value of the Korean language multiple-choice score. This means that the awareness that a teacher's teaching ability is high does not mean that the initial Korean language multiple-choice score is high. In comparison, it can be seen that the change value of the Korean language multiple-choice score has a statistically significant value, although it is not at a high level.

This means that the awareness that a teacher's teaching ability is high does not mean that the initial Korean language multiple-choice score is high. In contrast, although the change value of the Korean language multiple choice score is not high, it can be seen that a statistically significant value appears. This means that the awareness for teaching ability can increase and increase the multiple-choice score over time. Awareness for teaching ability appears relatively late compared to other factors. Teachers' teaching ability is an external factor that can be thought of in connection with the fact that it is a factor that is formed relatively slowly between teachers and students, and this will be discussed later in the conclusion.

V. Conclusions and Suggestions

1. Conclusion

Teaching-learning activity factors and reading activity factors

shown in the panel data of the Busan Longitudinal Study of Education so far, descriptive statistics of Korean language academic achievement and correlations between factors, and the process of change of factors and condition change latent growth modeling that affect multiple-choice scores factors were analyzed.

First, it was found that the Korean language academic achievement of middle school students in the Busan was continuously increasing. However, as a result of dividing the multiple-choice score into the descriptive score, it was found that the multiple-choice score continued to decrease. On the other hand, it was found that the descriptive score increased. The fact that the descriptive score is increasing can be said to be a meaningful change in line with the education policy for the introductory evaluation item. Nevertheless, it is not considered educationally correct for the multiple-choice score to decrease, so a study on the change process by which the multiple-choice score decreases is needed.

Second, looking at the descriptive statistics of teaching-learning activities, it can be seen that the teacher's enthusiasm, teacher's teaching ability, teacher-centered teaching method, and subject interest average are continuously lowered. Teaching ability and teacher-centered teaching method revealed the learner's awareness for the teacher, which can be seen as a decrease in awareness for teacher among middle school students in Busan.

Third, looking at the correlation between factors, it was found that the correlation between Korean language academic achievement and other factors was low. It can be seen as a different result from the general awareness that teaching-learning activities affect academic achievement. Considering the characteristics of the panel data that investigated learners' awareness, further discussion is needed as to whether the correlation or influence between teaching-learning activities and academic achievement is actually insignificant. However, it is necessary to pay attention to the fact that learners perceive that the correlation between teaching-learning activities and academic

achievement is low.

Fourth, the correlation of teacher-related factors was found to be high. It was found that the correlation between awareness for teaching ability and teaching method was consistently high for 3 years. On the contrary, it was found that teacher's enthusiasm did not have a high correlation with other teacher-related factors. This fact can be assumed that middle school students' awareness for teachers, especially the awareness for classes, is influenced by the teachers' awareness of classes.

Fifth, it was found that the correlation between the defining factors, which are internal factors, was high. When combined with the results of the analysis of the research model, it can be seen that there is an effect of positive factors on Korean language academic achievement. In addition, through the parameter estimation of the research model, it was found that the influence of the initial defining factors decreased over time, while having a significant influencing relationship with the initial Korean language grades. It can be seen that the influence of the defining factor is immediate and lasts for a short period of time. Therefore, it is necessary to provide continuous stimulation in order to provide appropriate educational interventions using affective factors.

Sixth, as a result of analyzing the condition-changing latent growth modeling, it was found that the initial reading activity, sense of efficacy, interest, and attitude had a significant effect on the initial value of the Korean language multiple-choice score. This shows that the influence of the learner's internal factor on the initial value of academic achievement is significant. On the other hand, since the parameter estimates of these factors for the change value show negative relationships, it can be assumed that the influence of the positive factors does not last but appears for a short period of time.

2. Suggestion

Based on the results of the study, we propose the following policies. First, it is necessary to develop educational interventions that can stimulate learners' affective factors. Through this study, it was confirmed that defining factors such as class attitude, subject efficacy, and interest have an effect on the initial Korean language multiple-choice score, that is, Korean language academic achievement, and that the duration of the effect is not long. This means that it is necessary to continuously stimulate the defining factors that affect academic achievement. Therefore, in order to continuously stimulate and manage the affective factors, it is necessary to comprehensively provide educational interventions at the level of on-site teachers, schools, and education offices. Considering the fact that most of the educational interventions provided by school education so far have been biased toward cognitive factors, it can be said that the need to provide educational interventions on affective factors is even greater.

Second, the teacher retraining opportunity system should be reorganized to enhance learners' awareness for teachers. Through this study, it was confirmed that the learner's awareness for the teacher was formed in a short period of time and did not affect academic achievement, but the initial awareness continued to affect the change value. There are two ways to improve learners' awareness for teachers. One is to provide institutional opportunities for teachers to develop subject expertise. Although teachers are allowed to receive more than 90 hours of training every year, most of the training is remote, and there are more training related to liberal arts than training that can directly enhance professionalism. Most teachers rely on what they have learned in training institutes and their experiences as teachers. The educational content of training institutes and experiences as teachers are factors that support the professionalism of teachers. Nevertheless, opportunities to enhance teachers' professionalism are needed in a situation where the educational environment is rapidly

changing, such as process-based performance evaluation, writing and essay-type evaluation, and student activity-oriented classes. To put it concretely, opportunities for reeducation comparable to the current 1st class teacher training should be provided periodically.

Third, in order to sustain the influence of reading activities, it is necessary to provide opportunities for learners to immerse themselves in reading. Through the results of the study, it was confirmed that reading activities affect Korean language academic achievement, but the influence of early reading activities decreases over time. It is necessary to continuously manage reading activities. In order to continuously manage reading activities, the quantity of reading is important, but it is necessary to manage the quality. This is because it is necessary for learners to feel the effectiveness and value of reading. In order for learners to feel the effectiveness and value of reading themselves and grow into active readers, opportunities to immerse themselves in reading must be provided. To this end, time and space conditions must be created to read books anytime, anywhere, in addition to what is currently being conducted, such as reading one book per semester and reading debate competitions.

Fourth, just as there is a reading education support system to encourage reading activities, a program that allows students to express their thoughts in writing and receive feedback is needed. Considering physical and social factors such as the number of students and the work of teachers, there are few opportunities for students to write their thoughts and receive feedback in schools. Nonetheless, since students are asked to express their thoughts, such as written and essay-type evaluations and student activity-oriented classes, opportunities to receive feedback from teachers or peers must be provided.

3. Significance and limitations of the study

This study is meaningful in that it analyzed the factors of middle school students' teaching-learning activities in the Busan, and was

able to grasp basic information about the characteristics and correlations of each factor, the process of linear change, and the variables that affect Korean language academic achievement. It is also meaningful as a basic data for establishing educational policies suitable for the characteristics of learners in the Busan. There was also a limitation in that there was difficulty in identifying the macroscopic structure of teaching-learning activities that affect academic achievement. I would like to finish this study with the hope that through longitudinal research data, an educational policy suitable for the actual situation of the Busan region will be established to help students grow and develop.

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ABSTRACT

A Study on the Factors Affecting Middle School Students' Korean Language Academic Achievement

: Focusing on Awareness of Reading, Efficacy, Interest, Teacher's Enthusiasm and Multiple Choice Evaluation

Kim, Kyoung-hwan

The purpose of this study is to identify the factors that affect middle school students' Korean language achievement and the relationship between them. In order to achieve the purpose of this study, the three-year data of the Busan Education Longitudinal Study were analyzed by applying the change process of teaching-learning activities and the latent growth modeling.

As a result of the study, it was confirmed that the Korean language academic achievement of middle school students in Busan is continuously increasing. In addition, the awareness for teachers was declining, and the correlation between teaching-learning activity factors and Korean language academic achievement was low, but the correlation between teacher-related factors was high. It was reported that the correlation of affective factors was higher than that of cognitive factors. As a result of analyzing by applying the latent growth modeling, it was found that reading activity, efficacy, interest, and attitude in the 1st year had a significant effect on the initial value of the multiple-choice score in Korean. As the influence on the change value showed a negative relationship, it was confirmed that the duration of the influence of the affective factor was not long.

Policy recommendations based on the research results are as follows. Provision of educational interventions that can stimulate learners' affective factors, expansion of teacher re-education opportunities to raise

learners' awareness for teachers and immersion in reading to increase the influence of reading activities It is necessary to create the conditions for writing, develop a writing program, and conduct qualitative research in parallel with quantitative research.

KEYWORDS Busan education longitudinal study, Panel data, Middle school students, Teaching-learning activities, Korean language academic achievement, Latent growth modeling, Affective factor, Teacher factor