

Structural Relationships of Teaching Strategies, Learning Strategies and Reading Literacy Scores

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Abstract. The purpose of this study was to examine the structural relationships of teaching strategies and students' learning strategies that affected the reading literacy performance. A structural equation model was employed as the methodology. The conclusions were as follows. First, the exogenous variables of teaching strategies influenced the reading literacy performance through the mediating variable, and the goodness-of-fit indices had a reasonable. Second, no significance was shown on any paths for the Korean model. On the contrary, for the Australian model those teaching strategies indirectly influenced the reading literacy performance through the mediating variable of memorizing.

Keywords: Reading literacy, Teaching strategies for reading, Students' learning strategies, Structural equation model

1 Introduction

The OECD has been evaluating education systems and students' outcomes worldwide through PISA since 1988. The primary goal of PISA is to assess students' literacy for reading, mathematics and science, and to analyze relations between students' literacy and background variants in order to help each country build their education policy and plan [1].

According to [2], teacher-related factors were the most crucial one that influenced students' reading literacy performance of PISA 2009 in every country. This means that teacher-student interaction is an important variable as a learning psychological factor that affects students' reading achievement. In this regard, many studies also reported that teaching strategies used in the classrooms such as questions, discussions and immediate feedback had impact on students' reading literacy [3, 4]. Teaching strategies influence not only students' academic achievement but also students' learning strategies. In the same context, it has been claimed that students' learning strategies had correlations with their learning achievements, and cognitive strategies such as memorization and elaboration increased the cognitive activities in students'

learning process resulting in a high level of achievement [5]. Thus, it is suggestive that teachers' teaching strategies have positive effects on both students' learning strategies and their learning achievements, and students' learning strategies may have mediating effect between teaching strategies and students' learning achievements.

This study aimed to examine and compare the structural relationships of teaching strategies and students' learning strategies that affected the reading literacy performance of PISA 2009 between Australia and Korea. For this study, the structural equation model (SEM) is used as the methodology to identify the complex causality of variables by including the estimated errors, and to investigate both direct and indirect influence of variables.

2 Methodology

2.1 Hypothesized Model

Based upon the literature review, a conceptual framework of variables is displayed in Figure 1.

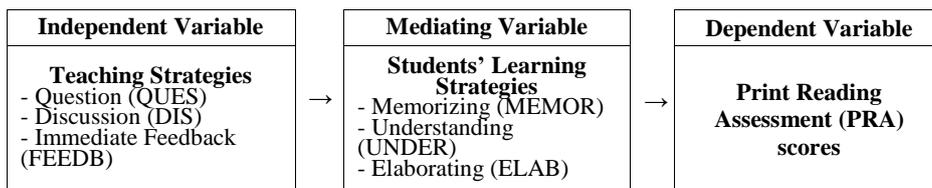


Fig. 1. Conceptual Framework of Variables

2.2 Sampling and Data Analysis

The data was obtained from the PISA 2009 database. The sample was selected randomly by proc surveysselect method of SAS. A total of 400 cases from each country were used for the analysis. A structural equation model was employed as the methodology for the study in order to identify the complex causality of variables by including the estimated errors, and to investigate both direct and indirect influence of variables [6]. The AMOS 20.0 software was used to analyze the data.

3 Results

3.1 The Model Fit

The model fit determines the degree to which the SEM fits the sample data. To analyze the hypothesized model, the model fit was assessed. As shown in Table 1, the followings are the overall model fit. To make the hypothesized model fit well, the model was modified and threshold for modification indices (MI) was settled on 4. In

this process, e4 ↔ e5 indicated that there was covariance between them as shown in Figure 2, because MI was over 4. Thus, the model in Figure 2 suggests that the structural equation modeling analyzes the relationships among teaching strategies, students' learning strategies and PRA scores for both Australia and Korea.

Table 1. Goodness-of-fit Indices

	χ^2	RMSEA	GFI	AGFI	NFI	TLI	CFI
Hypothesized model	801.882 (df=174, p=.000)	.067	.908	.878	.930	.933	.944
Final structural model	703.523 (df=173, p=.000)	.062	.921	.894	.939	.943	.953

When the specific paths were examined, the results showed that teaching strategies did not directly influence the reading literacy performance, nor did students' learning strategies directly influence the scores.

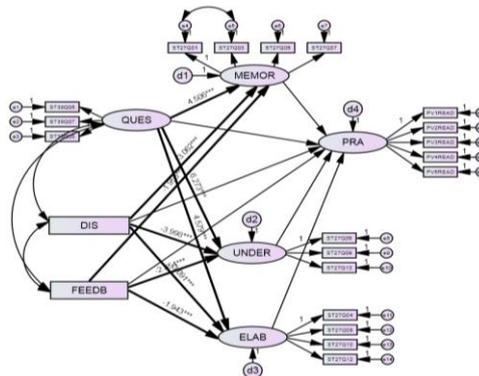


Fig. 2. Final Structural Model

3.2 Comparisons of Path Models of Australia and Korea

Path models of Australia and Korea were investigated to examine path differences between the two models of Australia and Korea based upon the results mentioned above. The unstandardized coefficient is appropriate to estimate the differences across the groups, because it indicates the average change in the dependent variable associated with a 1 unit change in the dependent variable, statistically controlling for the other independent variables. Specific results of path models are shown in Table 2.

Table 2. Unstandardized Coefficients of Path Models in Australia and Korea

Paths	Model for Australia		Model for Korea	
	Unstandardized B	C.R.	Unstandardized B	C.R.
QUES → MEMOR	1.308	5.929***	5.341	1.951
QUES → UNDER	2.932	7.715***	11.689	1.998
QUES → ELAB	1.489	6.173***	9.074	1.978
QUES → PRA	3543.131	.113	1506.485	.004
DIS → MEMOR	-.473	-4.958***	-2.166	-1.941
DIS → UNDER	-.993	-6.026***	-4.736	-1.985
DIS → ELAB	-.562	-5.361***	-3.692	-1.974
DIS → PRA	-1205.420	-.114	-626.342	-.004
FEEDB → MEMOR	-.346	-4.423***	-1.851	-1.922
FEEDB → UNDER	-.973	-6.988***	-4.046	-1.964
FEEDB → ELAB	-.420	-4.885***	-3.074	-1.904
FEEDB → PRA	-1117.996	-.114	-528.843	-.004
MEMOR → PRA	-85.112	-2.699**	9.859	.080
UNDER → PRA	-1071.582	-.101	72.731	-.002
ELAB → PRA	-39.783	-1.539	10.679	.132

* $p < .05$ ** $p < .01$ *** $p < .001$

4 Conclusions

The conclusions drawn from the study are as follows. First, as the results of the structural model fitted the exogenous variables (QUES, DIS and FEEDB) of teaching strategies influencing students' reading literacy performance through the mediating variables (MEMOR, UNDER and ELAB), the goodness-of-fit indices had a reasonable fit.

Second, when the specific paths were examined, the Korean model had no significance on most of the paths except for the five paths. On the contrary, for the Australian model those teaching strategies such as QUES, DIS and FEEDB indirectly influenced students' reading literacy performance through the mediating variable of MEMOR, although all six variables did not directly influence the reading literacy scores. This shows that an endogenous variable of memorizing can act as a mediator between teaching strategies and students' reading literacy performance.

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