

Evaluation of Bilingual Mathematics Learning of Mongolian Students in China¹

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This paper is devoted to evaluate the effect of bilingual mathematics learning of Mongolian students in the primary school of Inner Mongolia. The study used tests and examined 305 Mongolian students' math achievement from Mongolian school and 277 Mongolian students from Mongolian and Han mixed school, at the same time 301 students from Guangxi regular primary school for comparison. Multivariate statistical analysis shows that there is no significant difference between these students. The results showed that the implementation of bilingual mathematics education in Inner Mongolia have achieved the desired effect. The reasons leading to the observed results are analyzed. There is a long history of bilingual education in Inner Mongolia, so the bilingual education system is complete, and the bilingual teaching resources are relatively abundant, especially the mathematics term translation between Mongolian and Chinese is standardized and unified.

Keywords: knowledge expectation, international dialogue, teacher education

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I. INTRODUCTION

China is a multi-ethnic country with 56 ethnics. Among these ethnics, 12 ethnics have a long history of their own languages. Mongolian is one of the ethnics who have their own languages. According to the sixth Chinese census data, the population of Mongolians is about 6 million, and 70% of the Mongolians are located in Inner Mongolia.

The implement object of bilingual education in Inner Mongolia is mainly targeted at Mongolian students. The goal of bilingual education is to train students to master both the Mandarin and Mongolian languages. The primary school for Mongolian students can be divided into two types by the teaching language; one is Mongolian school, in which all courses are taught in Mongolian language, just adding one Chinese course. The other one is Mongolian and Han mixed school, in which all courses are taught in Mandarin.

This paper is devoted to evaluate the effect of bilingual mathematics learning of Mongolian students in the primary school of Inner Mongolia. There are many factors that can reflect the effect of bilingual mathematics education; this study selects the implement object of bilingual education, students' academic performance as the research object.

II. RESEARCH METHODS

Sampling

Tong Liao City, located in the eastern part of Inner Mongolia, is the city of the largest Mongolian population in China, which accounts for a quarter of the Mongolian population in China. So the Mongolian students in the primary school of Tong Liao City are chosen as the research target. 13 primary schools are randomly chosen, in which 6 schools are Mongolian school and 7 schools are Mongolian and Han mixed school. In each primary school, one class of the fifth grade is randomly chosen. 305 Mongolian students from Mongolian school and 277 Mongolian students from Mongolian and Han mixed school are the sample. At the same time, 301 fifth grade students from Guangxi regular primary school where bilingual education not involved are randomly chosen for comparison.

Table 1. Sample information

Category	Number of students
Mongolian school	277
Mongolian and Han mixed school	305
Guangxi Regular school	301

Method

The study used tests and examined students' math achievement. Math test text is prepared in accordance with compulsory mathematics curriculum standards of China, including four areas that are number and algebra, space and graphics, statistics and probability, and comprehensive application. The reliability and validity of the text have been verified in the preliminary investigation.

III. RESULTS

Data analysis

Score in the four mathematics areas of these three different types of students is shown as Figure 1.

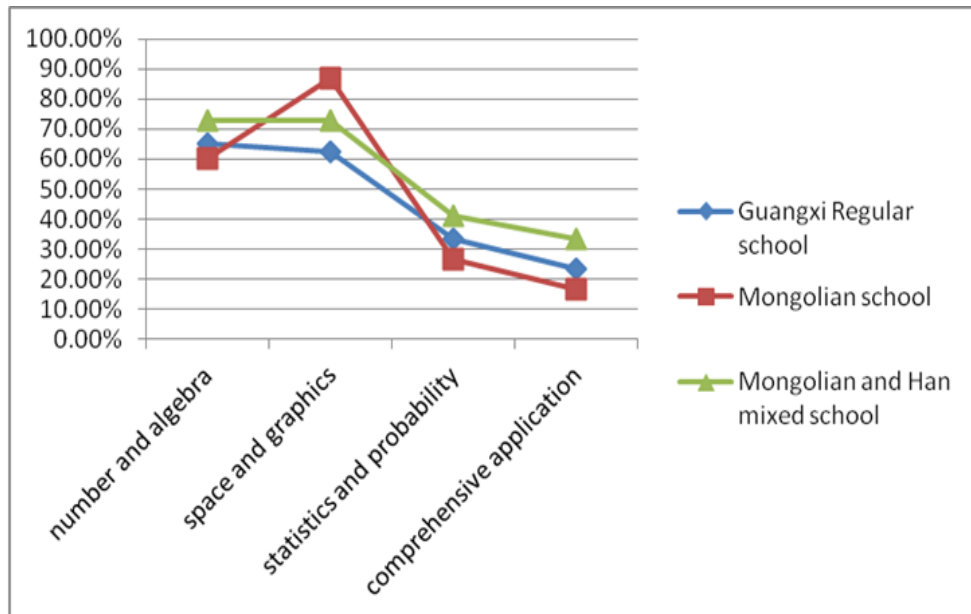


Figure 1. Comparison

It can be seen from the diagram that Mongolian students from Mongolian school perform well in the space and graphics area. Multivariate statistical analysis shown as table 2 shows that there is significant difference between Mongolian students from Mongolian school and from Mongolian and Han mixed school, Mongolian students from Mongolian and Han mixed school perform better. But Multivariate statistical analysis shown as table 3 shows that there is no significant difference between Mongolian students from Mongo-

lian school and from Guangxi regular primary school (significance level $\alpha = 0.01$).

Results analysis

The results showed that the implementation of bilingual mathematics education in Inner Mongolia have achieved the desired effect. Although Mongolian students from Mongolian and Han mixed school perform better than students from Mongolian school in general, but in the space and graphics area, students from Mongolian school perform much better. There is no multilingual and multicultural problem for the students from Guangxi regular primary school, thought they would perform much better, but the result is not so. This largely verifies the implement effect of bilingual education in Inner Mongolia.

Table 2. Independent sample test between Mongolian students from Mongolian school and from Mongolian and Han mixed school

		Levene's test for equality of variances		t-test for equality of means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	95% confidence interval of the difference	
									lower	upper
Score	Equal variances assumed	6.181	.013	-8.202	400	.000	-12.264	1.495	-15.204	-9.324
	Equal variances not assumed			-7.575	200.133	.000	-12.264	1.619	-15.457	-9.071

Table 3. Independent sample test between Mongolian students from Mongolian school and from Guangxi regular primary school

		Levene's test for equality of variances		t-test for equality of means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std.error difference	95% confidence interval of the difference	
								lower	upper	
Score	Equal variances assumed	10.004	.002	2.177	766	.030	2.380	1.093	.233	4.526
	Equal variances not assumed			2.288	660.395	.022	2.380	1.040	.338	4.421

IV. CONCLUSION

The results showed that Mongolian students can learn math well in the bilingual environment and multicultural background. The main reasons leading to the observed results are analyzed as following.

First, there is a long history of bilingual education in Inner Mongolia. Since 1947, Inner Mongolia began to explore bilingual teaching mode, and gradually formed its own characteristics of the bilingual education system. Sustained and stable development of bilingual education is undoubtedly the wealth.

Secondly, the bilingual education schooling system in Inner Mongolia is complete and mature. From preschool education to postgraduate education, Inner Mongolia has Mongolian language teaching schools and majors in all learning stage. To the Mongolian students, they have relatively equal opportunities in the field of academic studies and work.

Again, the resources of bilingual teachers are relatively abundant. All of the pre-service education colleges for teachers have Mongolian language teaching majors in Inner Mongolia. The graduates enrich the bilingual teachers and at the same time guarantee the stable development of bilingual teachers. Adequate reserve bilingual teachers are a necessary condition for sustainable development of bilingual education. At this point, Inner Mongolia obviously has its own unique advantages.

Finally, Mongolian mathematics professional vocabulary is stable and standardized in the mass. Standardized and unified mathematical term is very important for mathematics teachers teaching and students learning.

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