

## Three -Level Analysis of Effect of Class Teacher’s Qualification on Primary Students’ Academic “Increment”

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**Abstract:** *In the past in China, student’s academic quality is evaluated only according to their score they have got in every examination, that make the students whose examination score is always in low level lose heart. But now many educators begin to pay attention to the progress or the increment student get in one examination compare to last examination. In order to promote the increment, we use three-level analysis to see which factors include not only schools, teachers, families, but also include students themselves effect student’s progress most. We find teacher’s qualification is the most important factor that effect student’s progress most. Then we devoted to discuss which character of the teacher’s qualification effect the student’s academic increment most in order to improve teacher’s quality and make scientific teacher arrangement.*

**Keywords:** *teacher’s qualification; primary school student; academic increment.*

### 1. INTRODUCTION

The function of education is helping student to develop their potential and promote student’s diversity development according to their interest and potential. For example, a student learn ten skills in one year is much better than only learn one skill. That is a truth easy to understand. But in the present education in china, society, school and parents pay more attention not on the development of youth’s interest and ability, but on the level of students’ knowledge test score. That’s make the Chinese student study knowledge hard all day and have no time to develop their interest and ability and leave behind a weak body. For example one Chinese primary student will spend 9 hours on studying knowledge and junior or senior middle school student spend even exceed eleven hours. Maybe, that’s not the only problem of Chinese education, another problem exist in Chinese education is its evaluation, in the past and nowadays, in most time, evaluation on students is not to see how much progress they make in one test compare last test, but to see the absolute score students get in one test. That makes a lot of student lose their heart after many tests. In order to change the situation, in this article, we pay more attention on the progress primary student make in every test and find which factors effect students’ progress most. In order to carry out the test, we select 3124 primary students. table 1-1 and 265 primary teachers table:1-3.

**Table 1-1.** *Information of primary school student*

sample Characteristic	sex		School position		grade		
	male	girl	county	city	3	4	5
Sample number	1516	1484	989	511	900	900	1200
percent (%)	50.5	49.5	66	34	30	30	40

**Table 1-2.** *Basic academic information of primary school students*

variable	label	N	mean value	standard deviation	minimum value	Maximum value
Z_CHINE	Chinese	24697	0.0000	0.9951	-7.8322	10.8587
Z_MATH	Math	24696	0.0002	0.9942	-6.6764	10.6472

**Table1-3.** *Information of primary teachers*

sample Characteristic	Primary subject			
	Chinese	math	English	other
Sample number	133	54	52	26
percent (%)	50.6	20.1	19.9	10.4

**1.1. Measure**

*1.1.1. Family Social and Economic Status*

Scholars at home and abroad usually regard family income, parents education level and occupation as the 3 variables in synthesizing family social and economic status index (Bradley & Corwyn, 2002; Chunrong Ren, 2010). the survey of family income refer to the related research of Fuzhen Xu Wenxin Zhang(2009), combined with the actual situation of the local economy, we divided family income into“below 20 thousand、 20~30thousand、 30~40thousand.....90-100thousand¥ and the above. and give them separate number of 1~10.

The education level of parents include: primary or below、 junior middle school、 senior high school or Secondary specialized school、 Junior College、 Undergraduate、 Graduate (include master and doctor) , give them separate number of 1~6.

Parent career occupation include: peasant, worker, teacher or research, government cadres or civil servants, lawyer, engineer, business management personnel, accountant, armyman, Individual / private enterprise owners, The self-employed or laid-off workers, free-lancer and other.(fuzhen Xu, wenxin zhang,2009) ,In accordance with the criteria for the classification of occupations, occupation is divided into 5 levels, respectively, the assignment is 1~5.[1]

*1.1.2. School Status*

On the location of the school, township is 0, city is 1, the school founding history is 1~29, Per capita area schools (provided by the school). Teacher and student ratio, teacher professional title ratio, make data statistics on male and female class teacher ratio and other, At the same time, the class teacher and the teacher's gender (female 0, male 1), working age, title (primary for 1, Intermediate 2, senior 3). The teacher's qualifications are mainly divided into technical secondary school, college, Graduate four grades, respectively the assignment 1~4.

*1.1.3. Academic Performance*

Students' performance mainly include: student's chinese language, mathematics, foreign language scores as measurement object. We will make a minus between the score of this term and last term. We will use the intercept to analysis the factor of effecting students' score.

**1.2. Method**

Use Spss12.0AMOS7.0 software and HLM 6.08 software to analysis the data.

**2. DESCRIPTION OF THE THREE LEVEL STATISTIC**

**2.1. Descriptive Statistics of the First Level Variables in Primary Schools**

*Table 2-1. Descriptive statistics of the first level in primary school*

variable	label	N	Mean value	standard deviation	minimum value	Maximum value
AGE_FA	Father age	3044	39.0117	3.8809	0	63
AGE_MO	Mother age	2968	38.6279	3.6787	2	60
CARR_FA	Father occupation	3073	1.1682	0.6323	1	5
CARR_MO	Mother occupation	2999	1.1304	0.5741	1	5
INCOME	Family income	3088	6.7489	8.1803	0	100
EDU_FA	Father degree	3075	2.3525	0.7857	1	6
EDU_MO	Mother degree	2998	2.1748	0.7594	1	6
GENDER	Student gender	3123	0.6122	0.4873	0	1
CLASS	class	3124	3.0765	2.7228	1	16
GRADE	grade	3124	5.1191	0.8335	4	6
Z_CHINE		3124	0.0031	0.6733	-5.5173	1.6996
Z_MATH		3124	0.0031	0.6851	-4.4745	1.9003

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#### 2.2. Descriptive Statistics and Relevance of the Second Level in Primary School

Table 2-2. Descriptive statistics of the second level in primary school

variable	label	N	Mean value	standard deviation	minimum value	Maximum value
M_YEAR	teacher Seniority	100	13.4600	9.8259	0.5	34
M_AGE	Teacher age	100	35.9300	8.7482	23	53
IF_M_MATH	Whether teaching math	100	0.2300	0.4230	0	1
IF_M_CHINE	Whether teaching Chinese	100	0.5800	0.4960	0	1
IF_M_ENGLISH	Whether teaching English	100	0.1900	0.3943	0	1
CLASS_SCALE	Class size	100	30.0	0.0	30	30
GRADE	grade	100	5.1000	0.8348	4	6

#### 2.3. Descriptive Statistics and Relevance of the Third Level in Primary School

Table 2-3. Descriptive statistics of the third level in primary school

variable	label	N	Mean value	standard deviation	minimum value	Maximum value
REGION	School area	10	0.2	0.4216	0	1
PERIOD	School history	10	23.1	6.9354	10	30
SYSTEM	School system type	10	1	0	1	1
AREA_S	Per capita school area	10	41.294	13.5362	18.31	70.56
AREA_C	School size	10	34.814	48.2213	6.2	171.03
SCHOOL_SCALE	Teacher-student ratio	10	1553.5	1865.29	900	6835
R_T_S	Middle /senior teacher /student ratio	10	0.099	0.0238	0.06	0.15
R_MT_S	Teaching expert/student ratio	10	0.045	0.0158	0.02	0.07
R_ET_S	Male teacher ratio	10	0.028	0.0103	0.02	0.05
R_M_F	Male class teacher ratio	10	0.487	0.0842	0.42	0.66
R_M_F_HT		10	0.652	0.2057	0.34	0.96

### 3. RESEARCH OUTCOME

#### 3.1. The Influence of the Class Teacher's Qualification on the Primary School Students' Chinese Learning Achievement Increment

Table 3-1. Third types of variance analysis of the students' language performance in hierarchical regression

level	Effect	Significant	NumDF	DenDF	FValue	ProbF
First level	AGE_FA	***	3	23368	8.2325	0.0000
	AGE_MO	*	3	23368	2.5659	0.0527
	CARR_FA	*	4	23368	1.9812	0.0944
	CARR_MO	***	4	23368	8.0913	0.0000
	INCOME		3	23368	1.6893	0.1669
	EDU_FA	***	5	23368	21.8953	0.0000
	EDU_MO	***	5	23368	5.7110	0.0000
	GENDER	***	1	23368	19.8053	0.0000
Second level	M_GROUND	***	4	23368	9.9669	0.0000
	M_YEAR	***	3	23368	9.2617	0.0000
	M_AGE	***	3	23368	12.1246	0.0000
	M_GENDER	***	1	23368	70.5781	0.0000
	M_COURSE	***	2	23368	26.0007	0.0000
Third level	REGION		0			
	PERIOD		1	23368	0.1199	0.7292
	AREA_S	**	1	23368	5.0058	0.0253
	AREA_C		1	23368	1.1451	0.2846
	R_T_S		0			
	R_MT_S		1	23368	1.0623	0.3027
	R_ET_S		0			
	R_M_F		0			
	R_M_F_HT		0			

Through the table, we can see, in addition to the family income, gender age of father, mother's occupation, parents' education and the sex of students themselves is extremely significant to explain students' language achievement .(with a probability of less than 0.0001). Mother's age, father's occupation has the explanatory effect under 10% significant level (with the probability of less than 0.1).

For the second layer variables, class teacher's educational background, seniority, age, gender, and teaching courses have very significant results on students' Chinese achievement (with a probability of less than 0.0001).

To the third level variables, because the sample variation is too small (only ten schools) so the effect is not so obvious, the average per capita campus area has a better explanation on Chinese language performance (with a probability of 0.0253).

**3.2. The Influence of the Class Teacher's Qualification on the Primary School Students' Math Learning Achievement Increment**

**Table 3-2.** *Third types of variance analysis of the students' math performance in hierarchical regression*

level	Effect	Significant	NumDF	DenDF	FValue	ProbF
First level	AGE_FA	***	3	23367	5.7317	0.0006
	AGE_MO	***	3	23367	4.0714	0.0067
	CARR_FA		4	23367	1.0571	0.3760
	CARR_MO	***	4	23367	6.4784	0.0000
	INCOME	***	3	23367	6.8150	0.0001
	EDU_FA	***	5	23367	20.6307	0.0000
	EDU_MO	***	5	23367	8.1667	0.0000
	GENDER		1	23367	1.0198	0.3126
Second level	M_GROUND	***	4	23367	20.9780	0.0000
	M_YEAR	***	3	23367	8.2041	0.0000
	M_AGE	***	3	23367	7.2671	0.0001
	M_GENDER	***	1	23367	10.4082	0.0013
	M_COURSE	***	2	23367	64.4811	0.0000
Third level	REGION		0			
	PERIOD		1	23367	1.3996	0.2368
	AREA_S		1	23367	0.3461	0.5563
	AREA_C		1	23367	0.4322	0.5109
	R_T_S		0			
	R_MT_S		1	23367	0.1895	0.6633
	R_ET_S		0			
	R_M_F		0			
	R_M_F_HT		0			

Through the table, we can see, in addition to students' gender, age of father, mother's occupation, mother's age, father's occupation, parents degree the is extremely significant to explain student's math achievement (with a probability of less than 0.01

For the second layer variables, class teacher's educational background, seniority, age, gender, and their teaching courses have very significant results on students' math achievement, in addition to the class teacher gender variables with probability of 0.0013, other variables with probability is less than 0.0001.

To the third layer variables, because the sample is too small, variance are not significant.

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#### 4. HIERARCHICAL REGRESSION RESULTS OF ALL

##### 4-1. Hierarchical regression results of all

Variable setting			Primary school	
Level	Variable name	label	Chinese	math
L1	AGE_FA	father age	Increase then decrease	Increase then decrease
	AGE_MO	mother age	Increase then decrease	decrease
	CARR_FA	father occupation	Senior management staff, minimum	Senior management staff, lowest
	CARR_MO	mother occupation	Senior management staff, lowest	Senior management staff, lowest
	INCOME	family income	Not significant	Increase first then decrease
	EDU_FA	father degree	increase	decrease
	EDU_MO	mother degree	increase	decrease
	GENDER	student gender	Female high	Female high
L2	M_GROUND	teacher degree	increase	Undergraduate or high school
	M_YEAR	teacher Seniority	increase	Increase then decrease
	M_AGE	Teacher age	increase	decrease then Increase
	M_GENDER	Teacher gender	Female high	Female high
	M_COURSE	Teacher course	English high	English high
L3	REGION	School area	Not significant	Not significant
	PERIOD	School history	Not significant	Not significant
	SYSTEM	School system type	Not significant	Not significant
	AREA_S	Per capita school area	increase	Not significant
	AREA_C	Per capita building area	Not significant	Not significant
	R_T_S	Teacher-student ratio	Not significant	Not significant
	R_MT_S	Middle /senior teacher /student ratio	Not significant	Not significant
	R_ET_S	Teaching expert/student ratio	Not significant	Not significant
	R_M_F	Male teacher ratio	Not significant	Not significant
R_M_F_HT	Male class teacher ratio	Not significant	Not significant	

Through the analysis of the above results, we get the following conclusions:

4.1. In increases of student achievement, in general, the higher head teachers and subject teachers education is, the bigger and more student achievement increase, That means teacher education is conducive to enhancing the students' grades and achievement increase. This is consistent with the results of interviews with some students, the higher the degree of teacher education, that can give students a better impact.

4.2 In increase of students' learning achievement, that not mean the older teacher's age is, the longer of teacher’s service is, the quicker students' learning achievement develop. only the teacher’s length of teaching service close to the average length of of all teachers. Then the teacher can have remarkable and positive effect on the increment of the students learning achievement. That means the teacher who is in middle age has richer experience and energy in improving students' academic performance than the new teacher or the elder teacher.

4.3. The effect of socioeconomic status on the changes of students' academic performance is not significant, which shows that the effect of family socioeconomic status on increase of students' academic performance is not obvious.

4.4. Except inconspicuously effect to the primary Chinese language learning achievement increment, primary school founding history has significant effect not only on primary student academic performance, but also has significant effect on middle school student academic performance, That means the longer the school founding history is, the higher the teaching quality of the school is the quicker student’s academic performance raising.

4.5. Except for the junior middle school Chinese language learning achievement, in primary school, the student subjects learning incremental results have no significant gender differences.

4.5. Except conspicuously effect to the junior middle Chinese language learning achievement increment in the primary school. That means students' academic achievement does not increase with the increase of the proportion of senior professional titles, which indicates that the teacher's senior professional title does not necessarily lead to the improvement of students' academic performance.

The above is the interpretation of the results of this paper, in order to know the influence of teacher's qualification on middle school students' academic increment; we also carried out the analysis of influence of teacher's qualification on middle school students' increment.

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