

The Pennsylvania State University

The Graduate School

College of Education

**HOW DO GOVERNMENTS NARROW THE ACHIEVEMENT GAPS FOR
DISADVANTAGED STUDENTS IN MAINLAND CHINA, HONG KONG AND
TAIWAN?**

A Thesis in

Educational Theory and Policy

by

Chao Su

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Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Master of Arts
May 2018

The thesis of Chao Su was reviewed and approved* by the following:

David Post
Professor of Education
Thesis Advisor

Roger Shouse
Professor of Education
Second Reader

Kevin Kinser
Professor of Education (HIED)
Head of the Department of Education Policy Studies

*Signatures are on file in the Graduate School

ABSTRACT

The pervasive achievement gap associated with differences in socio-economic-status (SES) has been a near universal obstacle in achieving educational and social equality. In Asia, where education is generally regarded as the only pathway to upward mobility, governmental actions that soften the impact of family background and narrowed the achievement gap for poor students are worthy of investigation. In this thesis, I compare the effects from family backgrounds on students' academic achievement among three education systems in Asia with high-test scores: Mainland China, Hong Kong and Taiwan. The data analysis base on the Program for International Student Assessment (PISA) 2015. I also review the government efforts and policies in each system aimed at lower SES students. The goal is to inspire more research on comparing effective policies that help governments support to students from underprivileged backgrounds and to help them thrive in their increasingly knowledge-intensive societies.

Keywords: Socioeconomic Status (SES), Academic Achievement, Education Inequality, Mainland China, Hong Kong, Taiwan, Policy and Practice

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ACKNOWLEDGEMENTS

The three year's study and working experience at Penn State is definitely the most special and irreplaceable experience in my life. Now, there are many people that I want to thank.

I would first like to thank my academic advisor, Professor Post, for his consistent encouragements and inspirations. I would remember forever how he consistently encourages me to be more confident, determinant and proactive. This thesis would not be possible without his patience and word-to-word edition. In addition, his generosity and caring for all of us international students would be deeply appreciated and well remembered forever.

I appreciate some amazing students in the College of Education for their great support along the way: Dr. Maraki Shimelis Kebede, Dr. Chi Nguyen, Dr. Qiong Zhu, Dr. Yu Sun, Dr. Yi Meng and Dr. Chang Liu. I would definitely miss our learning and happy moments.

I feel very lucky to have a couple of marvelous friends at Penn State that I would love to keep the friendships forever. Mr. Yingjun Guan, great brother beloved by many of us; Hui Liu, special and sweet girl full of love; Dr. Jennifer Wu, my idol that I've been looking up to; Ms. Shasha Wang, consistently gives me more than expected like my older sister; Mr. Zhendong Huang, always quiet but always reliable; Mr. Ebrahim Mahairi, always sweet as my little brother.

In addition, I am lucky to be fully funded, as a master student, with the help of graduate assistantships kindly provided by The Office of Global Programs and The Library Assessment Office. I appreciate my sweet colleagues in these two offices as well as all the unexpected amazing opportunists they kindly gave me. Special thanks to Dr. Michael Adewumi, Ms. Sarah Guillén, Mr. Steve Borrelli and Ms. Lana Munip.

Lastly, I deeply appreciate my parents' love, trust and sacrifice for the past 26 years. Then, my final appreciation goes to Mr. Guo, for his integrity, sincerity, hardworking, trust and love inspired me to be a better person every single day. With him, I could not be luckier.

Chapter 1

Introduction

Purpose of the study

As part of the perennial fight to decrease educational inequality, governments have tried to allow access to educational opportunities for all students without regard to their socio-economic status (SES). Among those consistent efforts, researchers have paid special attention to students from lower SES families. Despite the proven positive association between family SES and students' school performance, there is an increasing number of studies on how lower SES students overcame their underprivileged background and performed well in school. For example, the Organization for Economic Co-operation and Development (OECD) used the PISA 2009 data to study high-achievers with lower SES backgrounds in 34 OECD countries in order to understand the possible factors that are associated with their possibility to “beat the odds” in school. Inspired by OECD’s research, this Master’s Thesis presents similar research with a focus on three Asian school systems: Mainland China, Taiwan, and Hong Kong. By analyzing the possibilities for lower SES students to overcome their underprivileged backgrounds, this research focuses on how governments’ in each of the three systems have helped lower SES students achieve at a level closer to upper-SES students.

The rest of this study is as follows. First, I review previous literature on the influence of family backgrounds on students’ academic achievement in Mainland China, Taiwan, and Hong Kong both separately and comparatively. Then I introduce the PISA data, sample, and analytic strategies. Next, I present descriptive analysis of the data in each school system, followed by the

results of linear regression estimations. The final discussion contains policy implications, as well as limitations of the study and future directions of the research.

Research Questions

This study intends to increase our understanding of governmental efforts in fighting educational inequality. The purpose is to encourage further studies on ways to increase equal access to opportunities as well as to inspire more students from underprivileged backgrounds to succeed at school. By increasing our understanding of government efforts, we can help the field of education provide disadvantaged children with more opportunities and probabilities to change their life trajectories. Two detailed research questions for this research are:

1. Is there any difference in the influence of family backgrounds on students' academic achievement among students from Mainland China, Taiwan and Hong Kong?
2. If so, what school policies or governmental efforts could explain the difference? And what could be borrowed or learned between the governments in helping low SES students to access to education equally?

Chapter 2

Literature Review

Discussion on the relationship between students' family backgrounds and students' academic performance begins from "Coleman Report" (Coleman et al. 1996). The positive role of SES backgrounds in predicting students' academic achievement has been proved intensively in western context (Dupriez & Dumay, 2006; Duarte et al. 2010; OECD, 2004; OECD, 2007a; Schutz et al. 2007; Sirin, 2005). Many studies show that students from higher SES backgrounds perform better at school than those from lower SES families. What is more, based on a comprehensive study using data from 12 nationally representative studies in the United States, Reardon (2013) found a widening income gap in achievement and he concluded that upward social mobility has become much more challenging than it was 50 years ago. However, there are different assessments of this relationship. For example, White (1982) examined almost 200 studies using meta-analysis techniques and reported that "SES is only weakly correlated ($r = .22$) with academic achievement" (White, 1982 p. 461). There are also findings similar to White's in Chinese literature. For example, Guo (1994) analyzed 15 papers employing meta-analysis, concluding that family SES was a weak influential factor on students' academic achievement. A recent research holding a similar opinion is by Zhao and his colleagues. By analyzing the data obtained from primary schools in five Chinese provinces, Zhao et al. (2011) argued that family SES was a complex factor for students' academic achievement. Specifically, the effects of contextual variables disappear as predictors for students' math performance when students' characteristics were controlled. This indicates an interaction influence by individual variables and contextual variables.

Previous Studies in Mainland China

Scholars have conducted extensive research both comparatively and separately in the context of Mainland China, Taiwan and Hong Kong. Because of the complexity of economic development level of Mainland China as well as the special *hukou*, the house registration system, researchers conducted similar studies in different areas with different research tools. Firstly, there are empirical studies in both less developed and economically advantaged areas in Mainland China. For example, Liu and Lu (2008) found a positive relationship between students' family SES and their academic achievement based on the data collected from five provinces of western part of China. Later, Sun et al. (2009) collected data from primary school students in Gansu Province and found that parental educational background and family income had significantly positive impact on students' academic achievement. Additionally, they found that the achievement gap across different family backgrounds would decrease as the increase of school investment, which also implied a need of school education investment for the poverty-driven areas. In terms of examining this relationship in big Chinese cities, Sun (1999) analyzed 153 students who were surveyed along with their family. There were also follow-up interviews for individuals in Shanghai. Results showed a strong relationship between students' SES backgrounds and their academic failure, with more academic failure among low SES families. Then, Pang et al. (2013) analyzed this relationship in five capital cities in mainland China, drawing data from PISA 2003 and PISA 2006. Results showed that students' family SES is significantly associated with their school performance and mother's educational backgrounds. SES exerted significantly more positive influence on students' school achievement. Similarly, Ren and his colleagues also chose five capital cities in different areas of China and investigated a sample of 5,066 students of grade nine, 581 teachers and 60 principals. Results indicated that family SES and school type were both significant influences on students' mathematics

achievement and ability (Ren et al. 2012). Regarding the increasing discussion of a special student group in China, i.e. children of migrant workers, Guo (2011) drew data from the Beijing Migrant Children Compulsory Education Survey and did a comparative study between children of migrant workers and those who are not in Beijing. Guo reached the conclusion that only family income has positive influence on students' school performance.

In addition, researchers also have examined the influence of family SES on students' school performance at different educational levels starting from pre-school to students' employment after college. Xiao et al. (2009) studied 143 first grade students in Beijing in terms of their mathematics readiness before primary schools across different SES families. They reached the conclusion that family SES is an important factor in predicting students' math achievement because higher SES students did much better on magnitude, geometry, model and statistics than their low SES counterparts. This is consistent with Park and Hannum (2001)'s study where they analyzed the Rural Basic Education Surveys of China's Gansu Province. Park and Hannum concluded that father's education background had a significant positive impact on elementary students' math performance. Furthermore, Ren and Xin (2013) did a three-year longitudinal study on 1,271 fourth graders. Their repeated measurement multilevel modeling indicated that family SES could significantly predict students' performance, but that it followed a U pattern. Additionally, the performance variance was becoming larger for middle and high SES students, while it was stable for low SES students. This implied the need of more compensatory education for low SES students. Turning from primary education to middle school education, Tao and Yang (2007) used a questionnaire of 40 high schools' students, and found that family backgrounds significantly determined whether students could access to key middle school. Statistics showed that there were 1.6 times the number of SES students than lower SES students in key middle schools in the cities. However, interestingly, they did not find any statistical relationship between family SES and students' academic achievement. Mainland Chinese

scholars have also researched how family SES influence students' employment opportunities after school. By analyzing a national graduate survey, Wen (2005) analyzed the relationship between SES, indicated by father's occupation and educational backgrounds, and students' educational and employment outcomes. The outcome variables included students' College Entrance Examination (*gaokao*) scores, their types of institutions, employment after graduation, as well as their income. Similar to what Wen (2005) did, Wang (2008) discussed Chinese students' employment situations and argued that family backgrounds, as an important part of social capital, affected students' educational level and further influenced the fairness of Chinese education.

In terms of China's educational system, scholars have also investigated whether Chinese New Curriculum Reform brought any positive influence in eliminating educational inequality resulting from family backgrounds. For example, Li and his colleagues conducted longitudinal research to compare the achievement gap across different socioeconomic family backgrounds between the reform group and the non-reform group. Results showed a decreasing achievement gap across different family backgrounds for both groups on measure of calculations and routine mathematics problem solving. For the open-ended problems, they found decreased achievement gap for the reform group but not for the other group (Li et al., 2011). This is inconsistent with studies done by Li (2003) and Wu (2010), where they argued that family SES has had a stable and increasing influence on students' school enrollment for the last decades.

Another question that scholars have been addressing is whether educational marketization and privation in China accelerated inequality between rich and poor families. Cheng et al. (2012) recruited 2,089 students from eight elementary schools and five middle schools in Beijing and concluded that students with better-educated mothers tended to attend more shadow education as well as have more pleasant attitudes. Additionally, according to Cheng (p. 67), "logistic regression indicated that the overall predictive power of school level, maternal educational level

and grade on mathematic supplementary educational time is 8.5 percent.” This conclusion could be further supported by the research conducted by Mok et al. (2009), which found that parents from low-income households benefit from Chinese marketization process less than do the urban and wealthier parents because lower income parents could not afford educational advantages for their children.

Additional evidence to support how family backgrounds positively influenced students’ academic achievement also come from the area of educational psychology. For example, Shi and Shen (2007) analyzed the Revised Scientific Creativity Tests for Adolescents for 415 participants recruited from middle schools in Beijing, finding that family SES has a significant influence on students’ intelligence, intrinsic motivation and creativity, with both direct and indirect effects on creativity through intelligence. Similarly, Chuang et al. (2017) argued that, compared with middle SES, children from lower SES backgrounds had lower level of reading and mathematics achievement. Lastly, Pan and Du (2009) randomly chose 553 primary and secondary students in rural areas and explored their scores on the Embedded Figures Test (EFT). The EFT indicates students’ cognitive styles and academic achievement, as well as their family backgrounds. Results showed that EFT was significantly associated with family SES regardless of students’ grade level, their father or mother’s occupation, and their educational backgrounds. Controlling for these factors SES was positively associated with EFT score, although it had a different impact across different grades.

Previous Studies in Taiwan

Researchers conducted research on family background’s impact on students’ academic achievement in Taiwan focusing on different school levels. By analyzing 261 Taiwanese students at the age of 11 years, Hung and Marjoribanks (2005) found that family SES positively influences

students' academic achievement. What's more, family SES significantly relates to parental aspirations and parents' involvement, which further improves on students' academic achievement. Additionally, Hung (2007) collected information from 261 6th-grade Taiwanese students in 2001 and argued that parents with higher educational backgrounds tended to provide better psychological support for their children, which then promote students' higher academic achievement.

Beyond high school, other researchers have studied the effect of family backgrounds on students' school performance. For example, Sung et al. (2014) conducted a longitudinal study to examine the associations between students' academic achievements and their family backgrounds. By analyzing a national standardized achievement test for junior high school graduates between 2004 and 2010, they found an increased achievement gaps among different SES groups and school districts. Furthermore, scholars also investigated college level and get consistent findings. Wu (2009) found that students from higher SES families attend the elite universities, while a larger percentage of lower SES students attend non-prestigious universities. This conclusion came from a data set, which combined 1,510 undergraduates from five national universities in Taiwan. Han and his colleagues (2003) conducted a similar research, where they analyzed the 1991-1998 Survey of Family Income and Expenditure in Taiwan and found a significant positive influence from family structure along with family income on students' college attendance rate.

Other research conducted in Taiwan also includes Lin (2007), where they found a stronger significant influence from family SES than from school resources on students' academic achievement. Additionally, drawing on cultural capital theory, Cheng and Kaplowitz (2016) analyzed Taiwan Education Panel Survey (n = 12,527) and found a strong relationship between parents' economic status and cultural capital, which was significantly associated with students' cultural capital as well as their academic achievement.

Previous Studies in Hong Kong

Most researchers examined the influence of family SES on students' school performance in Hong Kong by utilizing results from PISA from different test years. Take Chiu and McBride-Chang (2006) for example, they analyzed 4,405 Hong Kong students' data from PISA 2003, making the conclusion that lower family SES has fewer educational resources at home and had less communication with children. Lower SES negatively influences students' academic achievement. This is consistent with Ye (2010)'s finding, as his research also showed that parents from higher SES backgrounds tended to engage in more effective parent-child communications, and their communication was significantly associated with students' academic achievement. Using the same database but with a different focus from that of Chiu and (2006), Esther Ho (2006) analyzed 140 Hong Kong secondary schools participating in PISA 2003 data in order to research how different types of family involvement are associated with students' school performance. Ho's results showed that SES was found to be the strongest factor, among family structure, immigrant status and family resources, associated with family involvement, which is significantly related to students' school performance. Subsequently, Sun et al (2012) utilized PISA 2006 data in a multilevel model and found students had higher science achievement with high SES family backgrounds and with parents who value science. Furthermore, Zhou and Wang (2015) also studied the PISA 2009 data to test the likelihood and intensity of students' attendance in extra classes in Shanghai, Taiwan, Hong Kong and Macao. They found that students from higher SES families are more likely to participate in the out-of-school classes. Additionally, Tam and Chan's study (2009) indicated that parents' educational backgrounds positively affect their involvement in their children's homework. What is more, they found much less involvement level among parents with primary-school education or below. Notably, they also found that students

with parents of lower educational attainment would benefit more from parental involvement (Tam & Chan, 2009).

Other research on this topic comes from the area of Educational Psychology. Phillipson (2010) collected data from 215 upper primary school Hong Kong students along with information from their parents. She found parental effects on students' cognitive ability, which exert influence on their math and language performance. In addition, parental expectations and beliefs, which moderate the effects of SES, also help determine students' cognitive ability (Phillipson, 2010).

Comparisons among Mainland China, Taiwan and Hong Kong

Previous research comparing these three school systems reached a consistent finding, which is that family SES exerted the strongest impact in Taiwan and the smallest in Hong Kong. In other words, educational system in Hong Kong has been recognized as being functioned both excellence and equity.

According to TIMSS data, the achievement gaps among Hong Kong students becomes smaller compared with those of Mainland China, South Korea, Japan, Singapore, and Thailand in Woessmann's study (2005). Furthermore, using data obtained from the TIMSS 2003, Baird (2012) investigated the achievement gaps in 19 developed societies. Results indicated that school resources differences explain the gap between low and high SES students in Hong Kong, while students' personal characteristics (e.g. SES, family structure) explain the gap more in Taiwan. These findings are consistent with Ho (2010)'s conclusion that Hong Kong students benefit more equally from education regardless of their family backgrounds.

Two other recent international comparisons of family SES on students' school performance used PISA 2012 data, and both found significant relationships in the societies investigated. Kalaycioglu (2015) compared this relationship in England, Greece, Hong Kong, the

Netherlands, Turkey and the USA, finding the significant relationship was the lowest in Hong Kong. Similarly, Cheng and Hsu (2016) showed that the slope of family SES on students' math score was relatively smaller in Hong Kong (4.46) and the largest in Taipei (28.78) among six Asian societies. Additionally, by employing TIMSS data in the year of 2003, 2007, and 2011, Huang (2017) argued that Taiwan has the widest achievement gap in math performance, and found in addition that the gap is widening. In other words, the inequality level of educational opportunities in Taiwan was greatest internationally from grade 4 to grade 8. This inequality resulted mainly from within classrooms, like gender and residents. Therefore, Huang (2017) argued that the increasingly wider academic gap made Taiwan the most unequal society and a unique case worth investigating in the future studies.

Chapter 3

Methodology

Data and Sample

Sponsored by OECD, PISA aims to test knowledge and skills of 15-year-old students around the world. In PISA 2015, the mainly assessed subject is students' science performance. The focus of this study is Mainland China (N = 9,841), Taiwan (N = 7,708), and Hong Kong (N = 5,359). It is notable that Beijing, Shanghai, Jiangsu and Guangdong were the only four provinces included from Mainland China in PISA 2015, while Taipei was the only city from Taiwan. (OECD, 2016b). In order to make the PISA data more comparable, given that there were no students from rural areas in Hong Kong or Taiwan, the rural schools from Mainland China were not included to avoid confounding the influence of urbanity with family background. In this way, the final number of observations for this study are 3,670, 4,437 and 4,982 for Mainland China, Taiwan and Hong Kong respectively.

Analytic Strategies

In order to answer the two research questions above, I used linear regressions first to check the relationship between students' family SES and students' science score in Mainland China, Taiwan and Hong Kong. Next, I focused on the policy context in these three school systems, including the governmental efforts and policies on helping lower SES students to access to equal educational opportunities.

Measures

The dependent outcome variable in this study is students' science achievement. With focus on different subjects (reading, mathematics, and science) every three years, the major subject tested in PISA 2015 is students' science performance. Therefore, the variable of students' academic achievement in this research is their science score. The PISA 2015 Main Survey used ten multi-dimensional scaling models and ten questions, PV1SCI to PV10SCI, for science literacy. The science score used in this paper is the mean of these ten scores.

Students' family SES is the main independent variable for this study. The index of family SES, coded by ESCS by OECD, are from three variables in the PISA 2015 data: parents' education and occupation, home possessions, and number of books at home. Apart from this main independent variable of SES, I also included several control variables, mainly categorized into two levels: student-level and school-level.

For student-level, I controlled students' gender. In previous PISA studies worldwide, girls have lagged behind boys in science. With the increasing demand of scientific personnel, as noted by OECD, researchers have special interests in how to motivate (female) students to pursue scientific careers (Buccheri et al., 2011). Buccheri and his colleagues further concluded that the gender stereotypes played an important role in creating gender inequity in science education, cross nationally (Buccheri et al., 2011).

For school-level, I controlled school type and school resources. School type is categorized in private or public school, and as a dummy variable, 1 means students are from private school and 0 means public school. For school resource, three index represented it in this study: number of available computers per student at modal grade, student-teacher ratio, and proportion of all teachers fully certified. The rationale of including these factors are as follows. Firstly, whether the exposure of the technologies, in the high-technique society, is playing a

positive role in students' academic achievement is of great interest for researchers. As found by Delen and Bulut (2011), "students' familiarity with ICT and their exposure to technology helped to explain math and science achievement gaps between individuals and schools" (Delen & Bulut, 2011, p. 311). Then, as defined by Stronge (2007), certificated status is one of the six prerequisites of good teachers. Earlier than that, Goldhaber and Brewer (2000) empirically tested the relationship between high school teachers' certification status and their students' academic achievement. They concluded that teachers with certification could positively affect their students' school performance, compared with those who do not have certificate or hold private school certification.

Following is the linear regression equation:

$$Y = b_0 + b_1X_{SES} + b_2X_{Gender} + b_3X_{Private} + b_4X_{Computer} + b_5X_{Student-teacher\ ratio} + b_6X_{Certified\ teacher}$$

Chapter 4

Results

Descriptive Findings

Table 1 to Table 3 show the descriptive statistics in mainland China, Taiwan and Hong Kong respectively. As indicated from the tables below, 92%¹ of Hong Kong students are in private schools; for mainland and Taiwan, there are around 17% and 33% of them studying in the private schools. The gender distribution is quiet even, with half-half, in all these three school systems. In terms of the number of computers per student, the percentage (86%) is pretty higher than those of in mainland (51%) and Taiwan (48%). However, these three school systems share a similar percentage of professional teachers and a similar teacher-student ratio.

Table 1 Descriptive Statistics of Student Data in Mainland China, PISA 2015 (N=3,642)

| Variable | Mean | Standard Deviation | Minimum | Maximum |
|-----------------------|---------|--------------------|---------|---------|
| Private | .1694 | .3752 | 0 | 1 |
| Socio-economic status | -.3287 | 1.1095 | -4.2944 | 3.0364 |
| Male | .5047 | .5000 | 0 | 1 |
| Computer | .5114 | .4096 | 0 | 2.66 |
| Teacher-student ratio | 13.5493 | 9.6156 | 2.8 | 100 |
| Certificated Teacher | .9688 | .0634 | .6731 | 1 |

¹ Nearly all schools in Hong Kong are independently administered. Therefore, the majority of the middle schools in Hong Kong are private schools, by this definition.

Table 2 Descriptive Statistics of Student Data in Taiwan, PISA 2015 (N=4,437)

| Variable | Mean | Standard Deviation | Minimum | Maximum |
|-----------------------|---------|--------------------|---------|---------|
| Private | .3309 | .4706 | 0 | 1 |
| Socio-economic status | -.0343 | .7998 | -3.6361 | 3.4753 |
| Male | .5039 | .5000 | 0 | 1 |
| Computer | .4790 | .6362 | .0307 | 6.4216 |
| Teacher-student ratio | 16.9257 | 6.6723 | 4.6636 | 78.8169 |
| Certificated Teacher | .9149 | .1701 | 0 | 1 |

Table 3 Descriptive Statistics of Student Data in Hong Kong, PISA 2015 (N=4,982)

| Variable | Mean | Standard Deviation | Minimum | Maximum |
|-----------------------|---------|--------------------|---------|---------|
| Private | .9205 | .2705 | 0 | 1 |
| Socio-economic status | -.5476 | .9454 | -7.0445 | 3.2778 |
| Male | .5020 | .5000 | 0 | 1 |
| Computer | .8621 | .4807 | .1558 | 3.9535 |
| Teacher-student ratio | 13.6133 | 2.1617 | 2.2295 | 17.2381 |
| Certificated Teacher | .9413 | .1919 | 0 | 1 |

Regression Analysis

Table 4 Regression on Students Academic Achievement, PISA 2015

| VARIABLES | Mainland China | Taiwan | Hong Kong |
|--------------------------------|----------------------|----------------------|----------------------|
| Student Characteristics | | | |
| Socio-economic Status | 27.99*** (1.397) | 39.22*** (1.824) | 15.78*** (1.203) |
| Male | 12.42*** (2.966) | 4.350 (2.798) | 6.805*** (2.350) |
| CONTROL VARIABLES | | | |
| School Characteristics | | | |
| Private | -10.14** (4.760) | -51.25*** (3.591) | -6.066 (4.581) |
| School Resources | | | |
| Computer | 0.0222 (0.0235) | -2.342 (2.819) | -22.24*** (2.498) |
| Teacher-Student Ratio | -1.741*** (0.160) | 0.598** (0.259) | 8.760*** (0.582) |
| Certified Teachers | 298.8*** (33.49) | 37.08*** (8.571) | -17.30*** (6.117) |
| Constant | 309.5*** (33.24) | 529.6*** (9.301) | 451.7*** (12.89) |
| Observations | 3,670 | 4,437 | 4,982 |
| R-Squared | 0.23605 | 0.18666 | 0.15095 |

Note: Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4 displays the results of linear regression analysis of students' academic achievement in Mainland China (N = 3,642), Taiwan (N = 4,437) and Hong Kong (N = 4,982). Consistent with prior research findings on the positive relationship between students' family backgrounds and academic achievement, the evidence from PISA 2015 indicates that, in these three education systems, the higher of the students' SES backgrounds, the better of their academic performance. However, as evident from the coefficients above, the effects of family SES on students' academic achievement varied across the three systems. In Mainland China, the coefficient was 27.99, in Taiwan it was 39.22, and Hong Kong it was 15.78. More specifically,

the effect of family SES in Taiwan is 1.5 times more than that of in Mainland China, and 2.5 times more than that of in Hong Kong.

In addition, as evident from the analysis, male students have significantly higher science scores than females in mainland China and Hong Kong, but not in Taiwan. This might indicate that female students are performing as well as male students in science in Taiwan. Future research could investigate reasons associated with this indication.

The control variables included school-level factors. Students in private schools in mainland China and Taiwan significantly underachieve as compared with their peers in public schools. This is not surprising because most of the private schools in Taiwan and Mainland have less strict admission requirements as compared to public schools. These private schools, actually, usually aim for students from better-off families and most of the students would study abroad after graduating from private high schools. However, almost all students in public schools would take the once-a-year College Entrance Examination (*gaokao*). Therefore, students in public schools might outperform their peers in private schools. Comparatively speaking, there is no significant difference in science performance for students in private and public schools in Hong Kong. This equality might be because public schools and private schools are providing relatively similar quality of education, and there is a more equal education resource for students in Hong Kong than in Taiwan or in Mainland China.

The number of available computers per student for 15-year-olds has no significant influence on students' science performance in mainland and Taiwan, but has an unexpected and significantly negative influence on students in Hong Kong. One possible explanation is that this reflects computer usage policy in Hong Kong junior high and high schools. Perhaps students with access to more computers are distracted from their focus on academics. Researchers could investigate reasons associated with this indication.

The teacher-student ratio is another indicator of school resources. The regression results show that, not surprisingly, in Taiwan and Hong Kong, students in schools with higher teacher-student ratio scored higher. However, unexpectedly, a higher teacher-student ratio in mainland was associated with lower student achievement. One possible reason is the high percentage of temporary teachers in mainland Chinese schools. Therefore, higher teacher-student ratio also might mean higher turnover rate of teachers, which could negatively influence students' school performance. Future research should also look at the teacher training programs in mainland China, as higher teacher-student ratio cannot bring higher quality of education if there is no qualified teaching training programs.

Another indicator used for school resources is “certified teacher”, which refers to the proportion of all teachers who were fully certified. The coefficient is surprisingly high for the case of mainland, which implies that higher proportion of certified teachers could significantly help students perform better. Taiwan shares the similar result. However, perhaps unexpectedly, a higher proportion of certified teachers in Hong Kong is associated with lower science performance. This difference might be due to the different recognition systems of teacher certificate as well as different school systems. Therefore, further research could focus on how different the teacher certificate works under these three school systems to help understand this difference.

Chapter 5

Policy Reviews

Policy Review in Mainland China

Universal Primary Education (1949-1980)

Universalizing primary education became one of the priorities for the People's Republic of China (PRC) since its establishment in 1949. At that time, only 20 percent of school-aged children got access to schools and over 80 percent of the Chinese were illiterate or semi-illiterate (Hannum & Park, 2002). Although Chinese government made universal compulsory primary education within 12 years as its initial target in 1956, the three-year natural disaster (1959-1961) and the following ten-year Cultural Revolution (1966-1976) made this goal unachievable. However, Chinese government still made enormous strides that, by 1980, nearly all children received a primary education and the adult literacy reached to 70 percent (Hannum & Park, 2002).

Promotion of Nine-Year Compulsory Education (1980-)

The Chinese government continued its efforts in promoting nine-year compulsory education since 1980 and achieved a huge success. The *Decision on Universalizing Primary Education in Whole Country*, 1980, put forward the universal compulsory education for the first time, which was then further discussed in the *Decision on the Reform of Educational System*, 1985 (Wang & Lewin, 2016). On July 1st of 1986, the Chinese government officially

implemented the *Compulsory Education Law*, 1986, requiring children from the age of seven to sixteen to receive nine-year compulsory education, including elementary school (six years) and middle school (three years).

With the economic reform, “Reform and Opening,” in 1978, the number of Chinese people living in the poverty dropped to 30 million in 2000, which used to be 250 million (Fan et al., 2004). This huge economic development contributed to the promotion and universalization of compulsory primary education. In 1997, almost all primary students (98.9%) have been enrolled into schools and 94.1% of students enrolled into junior secondary schools in 2004 (Ministry of Education, 1998).

Table 5 below summarizes the Chinese government documents, from 1993 to 2010, about the policy development on promoting the nine-year compulsory education.

Table 5 Title of the Chinese Government Documents on Compulsory Education

| Time | Title of the Documents |
|-------------|---|
| Feb. 1993 | Guideline for Educational Reform and Development of China |
| Sep. 1994 | Opinions on Implementation of the Two Basics (i.e. universalizing compulsory education and eradicating illiteracy among the young and middle-aged population) |
| Jun. 1999 | The Decision on Deepening the Education Reform and Enhancing the Quality of Education |
| 2001 | Decision on Reform and Development of Basic Education |
| May 2005 | Some Suggestions on Enhancing the Balanced Development of Compulsory Education |
| Jun. 2006 | The Revised Compulsory Education Law |
| Jun. 2010 | Mid and Long Term Education and Development Program (2010–2020) |

Note. Data for Chinese government documents were cited from Wang & Lewin (2016, p. 10) and from Niu (2011).

Compulsory Education in Rural China

One of the biggest challenges of universalizing compulsory primary education in China is due to its remarkable regional difference in terms of the economic development. According to the 2000 census, the rural population of mainland China was 64% of the whole country (810 million) and among the schools, 80% of the primary schools were located in rural areas (Zhang & Minxia, 2006).

Geographically and socio-economically, mainland China has three different regions in general: The Eastern region, the Middle region, and the Western region. The Eastern region is the most economically advantaged and the Western the least. Based on their different situations, the government set different goals while promoting the nine-year compulsory education. For example, the focus for the East is on providing high quality compulsory education; the focus for the Middle is on developing rural education opportunities; while for the West, the goal is to focus on the “two basics”² and to accelerate school construction (Task Force, 2008; Wang & Lewin, 2016).

The 1985 Decision, *Decision on the Reform of Educational System* decentralized financing and management responsibility to local government. *The Compulsory Education Law* in 1986 further specified that State Council control the compulsory education management and the local government is responsible for it. As elaborated by Fan and Li (2010), the county and township fiscal revenue mainly support the expenditure for local compulsory education, and the township governments are responsible for the function of the financial resources. Under this management mechanism, the poor townships and villages were under great burdens, and the burdens would be transferred to parents (Xuedong, 2008; Fan & Li, 2010; Wang & Lewin, 2016).

² “Two basics” refers to the compulsory education and adult literacy programs (Task Force, 2008; Wang & Lewin, 2016).

Reforms Relating to Rural Compulsory Education

Reforms related to rural compulsory education, particularly on fund management, is an important perspective to help understand Chinese governmental efforts in universalizing the compulsory education. In 1994, in order to better make use of central governmental funds, the government formalized a tax-sharing system (Liu et al., 2009). Meanwhile, *The Opinions on Implementing 'The Program of Reform and Development of Education in China'* was issued and provided Special Education Fund to make sure students in poor areas could receive as much as the county average. However, this change still let those economically stressed township governments transfer financial burden to local farmers (Zhang, 2004; Wang & Lewin, 2016).

The new change made by the State Council in 2001 regulated that the rural compulsory education county-centered (Wang & Lewin, 2016). One of the most worth-mentioning requirements of the tax reform is that the peasants do not need to pay for the fees. There is no doubt that the exemption from fees and the management system reform released the financial burdens from farmers and poor households (Cai, 2013; Wang & Lewin, 2016). Therefore, this important reform marked the government became the major responsible financial source for the compulsory education (Yuan, 2004; Wang & Lewin, 2016).

In 2006, the Chinese government further issued a couple of remarkable policies that benefited the rural compulsory education. For example, the *Two Exemptions and One Subsidy* (TEOS)³ policy started in western part of China and the *Provisional Management Methods on Special Allocation Payment of the Central State in the Fiscal Security Mechanism for Rural Compulsory Education*. Under these new policies, students do not need to pay textbooks fee and the tuition. For the textbooks fee, the central government fund the Western schools and the local

³ “Two exemptions” refers to the miscellaneous expenses and textbook fee; “one subsidy” refers to the living allowance

governments fund the Eastern. Additionally, poor students could also get living allowances.

However, their eligibility as well as the amount of allowances depend on their local governments.

Policies and Projects Targeting for Rural Compulsory Education

The table below, from Croft, A. (2010), Task Force (2008, p. 145), and Wang & Lewin (2016, p. 12), summarizes some special funding projects that specifically targeted to rural compulsory education since 1995. These projects contributed largely to the success of universalizing free compulsory education for mainland Chinese students.

Table 6 Summary of Projects Targeting for Rural Compulsory Education

| Title | Time | Amount | Contents | Beneficiaries |
|--|-------------|------------------------|--|---|
| National Compulsory Education Project for Poor Regions | 1995–2000 | 12.5 billion yuan | Hardware; dangerous school building renovation; teaching facilities and books; teacher and school principal training | 586 national poor counties and 284 provincial poor counties, 250 million population |
| | 2001–2005 | 7.25 billion yuan | Free textbooks for poor children, IT education in poor areas | 522 poor counties that failed provincial accreditation |
| National Study Aid for Poor Areas | 1997–2000 | 130 million yuan | Support for minority students for compulsory education | Minority students |
| | 2001–2005 | 100 million yuan | Support for poor students for compulsory education | Western region poor students |
| Free Textbooks Fund | 2001–2003 | 7 hundred million yuan | Support for poor students for compulsory education | Students from poor households |
| Fund for Salaries of Rural School Teachers | Since 2001 | 5 billion yuan/year | Subsidy for the pay for rural school teachers in poor middle and western region | Rural school teachers in poor middle and western region |

| Title | Time | Amount | Contents | Beneficiaries |
|--|-------------|----------------------|--|--|
| Project for Reconstruction of Dangerous School Buildings | 2001–2003 | 3 billion yuan/year | Eliminating existing dangerous buildings for primary and secondary schools | |
| | 2003–2005 | 6 billion yuan/year | | |
| Distance Learning Project in Rural Primary and Secondary | 2004–2007 | 9 billion yuan/year | Rural primary and secondary schools in the western region | 86,400 teaching points, 252,000 rural complete schools |
| Rural Boarding School Project | 2004–2007 | 10 billion yuan/year | Rural primary and secondary schools in the western region | 6,400 new boarding schools, to support 3.2 million poor students |

Note. Data for Chinese government documents were cited from Croft, A. (2010), Task Force (2008, p. 145), and Wang & Lewin (2016, p. 12).

Policy Review in Hong Kong

Free Compulsory Education in 1971

The efforts for educational equality by Hong Kong government could date back to the 1960s. In 1965, government document stated that "the final aim of any educational policy must be to provide every child with the best education which he or she is capable of absorbing, at a cost which the parents and the community can afford" (Hong Kong Government, 1981, p. 11). In 1971, free primary education was universally available in Hong Kong. In 1978, the issued *Compulsory Secondary School Laws* aimed to provide free Form 1-3 places for all students. Around 20 years later in 1997, Hong Kong achieved the nine-year compulsory education for all (Howlett, 1998, pp. 141-2, 446; Lo, 1999; Ministry of Education, 1998, p. 5).

Obviously, the universalization of primary education is important to increase social mobility for disadvantaged population. As found by Pong and Post (1991) in their study of the consequence of post-war colonial educational involvement in Hong Kong, the net effect of family backgrounds on students' academic achievement was reduced over time. Specifically, it got easier for children of blue-collar father to finish primary and secondary school, and mother's educational backgrounds had less impact on the odds of continuing to secondary school (Pong & Post, 1991).

Along with the universalized primary education, the Labor and the Social Welfare Departments in Hong Kong also made consistent efforts to protect the right of free compulsory education for impoverished children. The introduction of the *Public Assistance Scheme* in 1971 and the arrangements to remit school fees could successfully persuade the worst-off parents to send their children to school instead of factories (Goodstadt, 2014).

Educational Reform After 2000

With the People's Republic of China re-gained the sovereignty of Hong Kong in 1977, Hong Kong initiated another remarkable wave of educational reform (Mok & Chan, 2001; Poon & Wong, 2008). In 1999, Hong Kong issued the *Learning for Life and Learning through Life: Reform Proposals for the Education System in Hong Kong*, marking the new reform. As Hon. Antony K. C. Leung, Chairman of the Hong Kong Education Commission articulated in his Foreword for the *Learning for Life and Learning through Life*: "It (Education) has a more far-reaching mission of giving everyone, regardless of social origin or family background, equitable opportunities for personal advancement. No one is deprived of such opportunities for self-development and success, if only he has the ability and determination to fully exploit the learning opportunities. Hence, education creates opportunities and facilitated social mobility." (Lee &

Manzon, 2014; Leung, 2000). However, the implementation of the reforms brought an increasing criticism on how it brought new forms of inequality to Hong Kong society (Lee & Manzon, 2014; Poon & Wong, 2008; Zhou, Wong & Li, 2015).

Abolition and Re-emergence of Examinations

Hong Kong used to follow the British educational system (6 + 3 + 2 + 2 + 3), which includes primary education (6 years), junior secondary education (3 years), senior secondary education (2 years), sixth-form education (2 years), and college education (3 years). Along with this system, students in Hong Kong need to pass three important examinations before accessing to higher education. Firstly, the Academic Aptitude Test (AAT) after the 6th year of the primary education. Then, in the fifth and last year of the secondary education, they need to go through the Hong Kong Certificate of Education Examination (HKCEE) and the Hong Kong Advanced Level Examination (HKALE) respectively.

In responding to the principles of the reform, which include student-focused and quality of education, there should be less stressful examinations for students in order to save time and energy for other meaningful activities. Therefore, the government abolished the AAT in December of 2000. Later in 2005, the Hong Kong government discussed the reform on secondary education in the document entitled *The New Academic Structure for Senior Secondary Education and Higher Education*. Following this document, they replaced the HKCEE and HKALE with one public exam, HKDSE, the Hong Kong Diploma of Senior Education.

Lee and Manzon (2014) argued that the abolition of the examinations is of great importance to provide students free schooling until Secondary 6 or a 12-year free education because of the lack of selection after the primary education. Therefore, this change, to some extent, protected students with underprivileged family backgrounds from being screening out.

However, researchers have more complicated opinions on it, when taking other policy changes along the way into consideration.

Adjustment of Admissions Policy

In the past, students graduating from the primary school have to take the AAT to get access to the junior secondary education. Their results along with their inner school examinations decided the secondary schools where they would be allocated. Generally, people categorize Hong Kong secondary schools into five bands, according to the Secondary School Places Allocation (SSPA) system. The band one schools were for the best students ranked by the standards above. However, as argued by the Education Commission (2000), they would keep adjusting the banding system in order to reduce or minimize its labelling effect. Therefore, the bands reduced to three from five in 2001.

Scholars agreed that reducing the bands decreased the inter-school differences despite increased the achievement gaps inside of schools (Lee & Manzon, 2014; Poon & Wong, 2008). Obviously, it is fairer to low achievement students for them not being allocated into band four or five schools. However, Poon and Wong (2008) argued that the reduction of the bands, along with the abolition of the AAT, brought inequality to poor students in Hong Kong. This is because, previously, those outstanding poor students could stand out easily through the AAT and then access to the higher band secondary schools. However, with the abolition of the AAT and the reduction of the bands, students with underprivileged backgrounds would not stand out as quickly as previously, which makes it more difficult for them to achieve social mobility through the pathway of education.

Aside from reducing the bands, Hong Kong's government also adjusted the admissions system for primary school. School principals used to have large decision power on the primary

school admission. In this way, under the previous admission system, family background may have played a larger role. Academic potential were also one of the key considerations. However, starting from 2001, the new Primary School Places Allocation (PSPA) system increased the proportion of allocation centrally from 35% to 50%. As illustrated by Poon and Wong (2008), the new PSPA reduced the control of primary school principals, as they used to be able to select up to 65% of the students to their schools. Now, school principals could only select 20% of the students, with the reminding 30% decided by school staff (Poon & Wong, 2008).

Similar to the reform above, on one hand, the change of admission policy to primary school favored low achievement and low SES students. However, on the other hand, it created new inequality for students from socio-economically disadvantaged families. As argued by Poon and Wong (2008), the admission to some elite schools actually first depends on whether one's family could move into the rich community, as several best primary schools located in the expensive districts. Because of this, students who has higher academic achievement but with underprivileged backgrounds have less opportunity to be enrolled because the quota from school principals has dropped. Therefore, Poon and Wong (2008) believe that the reform lowered the access to education for low SES students and thus brought a new inequality and inequity for the society. All in all, scholars consistently criticized how the reduction of bands and abolition of the AAT brought changes at the cost of the elites who had cultural capital in the Hong Kong community (Cheong Cheng, 2009; Poon & Wong, 2008).

Direct Subsidy Scheme (DSS)

Three types of schools in Hong Kong are government schools funded and run by government, aided schools run by their sponsors but financially aided by the government, and

private schools. In this way, traditional public schools (TPS) usually refers to the government and the aided schools.

In 1991, DSS was employed in order to replace the previous scheme, which refers the case that government reserve enrollment quotes for public access (Bray, 1994; Tse, 2008). Envisioned as a pioneer in providing high-quality education under the force of the market and freer parental choice (Tse, 2008), DSS schools use English as medium of instruction and can admit students across districts. As increasing traditional elite schools join in DSS, DSS schools became the symbol of more privileged schools in Hong Kong (Tse, 2008). Then, Unavoidably, DSS schools became the best choice for middle/high SES parents. As found by Zhou and his colleagues (2015), low SES students in DSS schools are not benefiting equally as higher SES students in aided schools. Therefore, the DSS is creating inequality for students with advantaged social backgrounds and is amplifying the effects of family backgrounds on students' academic achievement (Luk, 1990; Zhou, Wong & Li, 2015). In this way, "elitism has also resurrected among publicly funded educational institutions as a contradictory outcome of an equity policy initiative" (Lee & Manzon, 2014, p. 831).

Overall, scholars has criticized the reforms as sacrificing Hong Kong's cultural and social capital and leading a new version of inequality, since the elite schools and public examinations are of great importance in absorbing the most brilliant students (Lee & Manzon, 2014; Poon & Wong, 2008). In addition, since the principles of the reform included life-wide learning, student-focus, quality and society-wide mobilization, the society highly encouraged parents and community engaged in students' learning activities. For this, scholars argued that this actually also amplified the impact of family SES on students' school performance (Cheong Cheng, 2009; Poon & Wong, 2008), which lead to another form of inequality.

Policy Review in Taiwan

The Minister of Education (MOE) in Taiwan started its efforts in educational reform beginning in 1977. Policies and practices include the *Development and Improvement of National Education Five Years Book*, the *Development and Improvement of National Education Six Years Book*, and the *Rebuilt Educational Facilities for Middle and Primary Schools*. However, those policies had only a limited impact on closing academic achievement gaps due to the huge urban-rural difference in Taiwan (Chiu, 2010). As an unequal society, MOE furthered their efforts mainly in pursuing social justice by improving the relocation of educational resources and providing more support for disadvantaged population.

Educational Priority Area (EPA) Plan

In 1993, Minister of MOE, Weifan Guo, borrowed the idea of Educational Priority Area Plan (EPA) from England. At that time, England have had implemented the EPA plan for 26 years. In 1995, Taiwan implemented EPA with special governmental support for schools in need. The targeted schools are those facing natural disasters, and the targeted student population included Taiwan Aboriginal people, children from low SES families or new inhabitants. Students who were being taken care of by either their grandparents or a single parent were also included.

There were ten standards supported by the EPA from 1996 to 2009. At the very beginning, indicated by the MOE (1998), administrators were eligible to apply as long as the school meets one of the following standards. Specially, those school which has high percentage of aboriginal or low-income students, inconvenient transportation system for students' commuting, high percentage of students who are parented by either their grandparents or single parent, high drop-out rate, low entrance rate, low enrollment rate, high staff turnover rate, unfavorable

geographical conditions, bad educational infrastructure, and needs active consulting service for teenagers' adaption (MOE, 1998).

Schools that met one of the standards above were qualified to apply grants from the EPA committee and could get financial support after the investigation from EPA administrators. During the implementation of the policy, the local government also built the evaluation systems to guarantee the quality of the plan. Notably, MOE adjusted the specific standards annually since 1995 based on the urban/rural conditions and the change of the definition of "disadvantaged students". For example, in 2003 and 2004, EPA plan also considered those schools holding high percentages of students with foreign parents or parents from mainland China.

In addition, there were various supplementary projects along with the EPA policy. As found by Qiu (2010), they had projects and activities like promoting parental education and community educational activities, providing academic assistance program for children of aboriginal people or students from schools with bad transportation system, building and improving school infrastructure, improving children's lunch program, improving school bus system for areas that in bad transportation condition, and rebuilding community cultural activity center.

After-School Academic Support Programs

Starting from 1998, the MOE in Taiwan issued the *Afterschool Program for Elementary School Students*, which focused on low SES students, aboriginal children or students with special needs. Along with this program, the government started the *Remedial Teaching Plan*. In the year of 2006, the MOE conducted the program called *Hand-in-Hand After-School Care Program* focusing on "low-low" students, which means "from low SES families with low academic achievement" (Ho & Lin, 2012; Ministry of Education, 2006). Later in 2006, the government

merged this program with *The Remedial Teaching Plan*. Similar to the EPA plan, this program also targeted Taiwan's aboriginal students, children from low SES families or new inhabitants, and students who were being taken care of by either their grandparents or a single parent. Furthermore, the MOE issued the *Night Angel Enlightening Program* and *Digital Learning Partners Programs* in 2008 and 2010 respectively (Cheng & Jacob, 2016). Later in 2013, all these supporting programs were merged into *The Remedial Teaching Program* in order to make sure that disadvantaged students receive benefit of education in school, after school and out of school (Cheng, 2013).

Scholarly Discussions on Taiwan Educational Policies

Research has studied the implementation of the EPA plan and after-school remedial programs as well as their influence. Sung and his colleagues (2014) employed time series analyses on academic achievement gaps based on a national standardized test collected between 2004 and 2010. They argued that these policies helped narrow the achievement gaps due to ethnicity; however, the gap across SES groups and school districts has actually widened (Sung et al., 2014). Huang (2015) compared the achievement gaps within rural and urban students separately, and found predominant gaps across different SES backgrounds both within rural and urban areas.

In examining the policies and programs, criticism mainly focused on issue of funding management, lack of evaluation system, lack of specific focus on low SES students, as well as inappropriate implementation of the policies.

Funding Issue and Local Autonomy

Scholars shared a consistent criticism about funding issue. Chen (2007) illustrated in detail how the MOE funding influenced the implementation of EPA plan inside of the school. For example, schools usually applied funding in the previous November but got funding approval in March, which thus delayed the implementation of the policy in the following year. In addition, the MOE approve the EPA funding annually. Therefore, school leaders cannot predict whether they would get another-year of funding or not, and this uncertainty influences the sustainability of the implementation.

Therefore, researchers as well as school leaders argued that a flexible and stable budget would be of great importance (Yang, 2009; Sung et al., 2014). In addition, scholars indicated the importance of transferring autonomy to local authorities (Chiu, 2010; Hou et al., 2008; Tsai, 2000; Yang, 2009). As Hou and his colleagues (2008) noted, the MOE should consider the school calendar for funding appropriation. Because the funding delay would not be a problem if the local authorities could manage the funding appropriation. Sung et al. (2014) further criticized the highly inflexible funding administration from the central government. They argued that the funding appropriation is more complicated than necessary, as the subsidy was for specific purpose at a specific fiscal year. Additionally, they believed that the local governments and schools are more familiar with the local situation, so they could maximize the benefit of the funding (Sung et al., 2014).

Lack of Evaluation

Another consistent critique is on the lack of evaluation system to improve the efficacy of the policy implementation (Hong, 2001; Sung et al., 2014; Yang; 2009). Sung and his colleagues

(2014) argued that the corresponding evaluation system should be built up simultaneously with the implementation of the policies. Yang (2009) and Sung et al. (2014) also proposed to build up educational statistical institutions and provide empirical data in order to help evaluate the policies. However, in Chen and Yu's (2016) study, teachers complained about the amount of meaningless paperwork under the evaluation system as well as how it wasted their time and energy.

Lack of Specific Focus on Low SES Students

Sung et al. (2014) criticized how discontinuity of the policies influenced the support for low SES students by referencing the example of the *Subsidization Rules for Closing the Achievement Gap between Urban and Rural Areas* in 2004. This policy targeted low SES students by offering them after-school tutoring services and English classes. Sung and his colleagues (2014) found that this program stopped as the *Program of After-School Academic Support* was issued in 2005, which was actually for cultural minorities instead of for low SES students only.

Scholars indicated the importance of the programs designed with specific attention for lower SES students in order to decrease the achievement gaps across SES groups (Chiu, 2010; Hong, 2001; Sung et al., 2014). Specifically, the lower SES student group was one of the targeted population but it was not the only focus. Therefore, the plan and the programs did not provide sufficient support for this particular population. What's more, in the case of the *After-School Academic Assistant Program*, it is only for students from remote areas and outlying islands. For the after-school remedial programs, they were also for cultural minorities or students from remote areas instead of low SES students only (Sung et al., 2014).

Inappropriate Implementation

Another important critique is on the teaching method during the implementation of the policies. Firstly, as found by Chen and Yu (2016), the time for remedial classes was usually scheduled during after-school hours. Therefore, low-achieving students were not required to attend. Secondly, Chiu (2010) criticized that the same teaching method was used during the remedial classes, which could not make any positive changes to improve their academic performance. Furthermore, Chen and Yu (2016) found that most of the teachers believed the reason for low achieving was their lower motivation or insufficient cognitive ability instead of their different learning needs. Therefore, they used the remedial teaching opportunity to repeat the teaching content or let students do homework. Notably, Cheng and Jacob (2016) also reported this problem in their research, where they conducted surveys and focus groups for disadvantaged students in afterschool programs. Their research also indicated that remedial tutors re-teach content using the same pedagogy as the students experienced in class, and their only goal for the remedial classes was actually to help students complete their homework (Cheng & Jacob, 2016).

Top-down or Bottom-up?

Previous research showed inconsistent understandings between the MOE and the local governments/schools. Yang (2009) indicated this might be due either to the local government schools' misunderstandings of the purpose of the EPA plan or to the improper implementation of the plan. Furthermore, even inside of the schools, there is inconsistent reaction to the policies between school administrators and classroom teachers. Since reactions from teachers is of great importance due to their key role in transforming policies to practice (Chen & Jing, 2002), researchers also studied their reaction to the policies.

Hong (2001) conducted a survey of 838 teachers for their opinion of remedial teaching programs for disadvantaged students. He categorized three groups of disadvantaged students: aboriginal students, culturally disadvantaged students (e.g. students with parents from mainland China) and students from underprivileged family backgrounds (e.g. low SES students; student who was parented either by a single parent or grandparents). He found two levels of practices going on inside of the schools. One is the strategy promoted by school leaders outside of the class (e.g. free lunch, community tutoring, tutoring for the underachievement, special skills tutoring) and the other used by teachers inside of the classroom (e.g. encouraging students, encouraging other students to be nice to them, deliberately arranging their seating, promoting group study, and providing individual tutoring) (Hong, 2001). However, Hong (2001) realized that less than 20% of the teachers reported that their schools were implementing the remedial strategies promoted by their school leaders. For remedial practices inside the classroom, only up to 56% of the teachers employed remediation. His interviewees also explained that these practices might be because they, as teachers instead of the administrators, are unfamiliar with the remedial projects outside of the classroom. For the impact of the remedial practices, more than 75% of the teachers spoke highly of the free lunch, but 53% - 64% of them did not agree with the positive impact of the community tutoring for students from underprivileged families (Hong, 2001).

Chapter 6

Discussion and Conclusion

China, Hong Kong and Taiwan stood out consistently in international tests such as PISA and TIMSS for their high scores. However, they face different obstacles in their pursuit of educational equality and social justice. These differences are due to their different historic and economic backgrounds as well as different education policies. Leaders in each education system focus on different perspectives to promote educational equality. More specifically, as discussed previously, the three systems employed different strategies to close the achievement gaps created by unequal family socioeconomic backgrounds. More specifically, mainland China endeavored to promote the nine-year compulsory education to achieve access equality for all; Taiwan implemented a series of supplementary projects for socioeconomically disadvantaged under context of the remarkable rural-urban disparity; and Hong Kong changed the school assignment policy in order to provide a more equal quality education for all of their students.

As argued by Farrell (1997), there are four different perspectives to consider the equality in Education, namely access, survival, output and outcome. “Equality of access refers to the probabilities of being admitted into school. Equality of survival refers to the probabilities of staying in school to some defined level. Equality of output refers to the probabilities of learning the same thing at the same level. Equality of outcome refers to the probabilities of living similar lives as a result of schooling” (Farrell, 1997, p. 475).

In this study, the main efforts for equality made by mainland Chinese government have focused on equality of access and survival. Unlike Hong Kong and Taiwan, the main problems for mainland China are insufficient resources, as well as huge regional and urban-rural disparities.

As a large system starting from a point when 80 percent of the Chinese were illiterate or semi-illiterate (Hannum & Park, 2002), even the paid compulsory primary education was a challenge for the government. With the remarkable Open and Reform movement in 1978, mainland China became able to support the compulsory education with increasing financial resources. In its pursuit of educational equality, to guarantee all students access to equal compulsory education has always been the focuses. Based on previous policy reviews, we could see the efforts, or practice of “positive discrimination”, by Chinese government in providing special support in western China and rural areas. As argued by Rawls (1972), a just change would benefit the least advantaged during the resource distribution to achieve equality (Lo, 1999). “Resources for education are not to be allotted solely or necessarily mainly according to their return as estimated in productive trained abilities, but also according to their worth in enriching the personal and social life of citizens, including here the less favored” (Rawls, 1972, p. 107). In this way, Rawls’ ideas of equal opportunities further justified mainland Chinese efforts in fighting for equality (Lo, 1999).

For the case of Hong Kong, access to education is not a problem because Hong Kong achieved the free compulsory education in 1977. The more obvious equality issue is related to the unequal level of quality education (Lo, 1999), which is consistent with the “equality of output” defined by Farrell (1997). Hong Kong’s policy reforms, especially after 2000, included the abolition of examinations, the adjustment of admission policy and the Direct Subsidy Scheme (DSS). These reforms were to eliminate disparities of quality education influenced by students’ family backgrounds. Meanwhile, “Concern over the uneven distribution of educational opportunities is related to the non-material aspects of resources, which are especially evident in the structural segregation by achievement and family background, two intimately related factors in the calculation of school performance” (Lo, 1999, p. 21). As discussed previously, scholars and researchers had criticized how these reforms aroused a new form of inequality that erode Hong

Kong's elitism. Despite of these negative comments on the educational reforms after 2000, researchers have agreed to regard Hong Kong as a role model in mediating the family backgrounds and students' academic achievement, both in Asian and around the world. This could explain why, in this study, the effects of family SES on students' science achievement is 1.5 and 2.5 times smaller than that found in Mainland China and Taiwan, respectively. A well-documented research mentioned previously in the literature review also consistently proved the lower impact power resulting from family backgrounds in Hong Kong than that of other communities.

Similar to the situation of mainland China, the major educational equality issue that Taiwan has faced is also due to the remarkable urban-rural difference. In the endeavor to narrow students' achievement gaps between cities and the countryside, both Taiwan's *Educational Priority Area Plan* and *After-School Academic Support Programs* played an important role in pursuing educational equality in Taiwan. Most criticism focuses on Taiwan's unequal funding allocation, lack of local autonomy as well as lack of evaluations for the systems. Furthermore, researchers criticized the pedagogical issues of the remedial classes, which might not be effective as expected for disadvantaged population.

To conclude, this thesis reviewed policies in Mainland China, Hong Kong and Taiwan in order to help understand what these three educational systems did to compensate the socioeconomically disadvantaged population. Although there are different obstacles and challenges, they all made efforts to better achieve educational equality, at different levels. Although the context of mainland China and Taiwan are so different from that of Hong Kong, some efforts made to pursue educational equality by Hong Kong could still be potentially applicable for mainland China and Taiwan. For example, the reform of school assignment policy could be a good reference for Mainland and Taiwan educational leaders, since school assignment appears to be a key way to transmit parental SES to the next generation. Therefore, Ministry of

Education in mainland China and Taiwan should find alternative ways to replace the traditional school assignment procedure. However, they should adjust assignment policies taking their specific contexts as well as their large regional and rural-urban disparities into consideration.

BIBLIOGRAPHY

- Baird, K. (2012). Class in the classroom: The relationship between school resources and math performance among low socioeconomic status students in 19 rich countries. *Education Economics*, 20(5), 484-509.
- Bray, T. M. (1994). The quality of education in private schools: Historical patterns and the impact of recent policies. In: *Siu PK and Tam PTK (eds.), Quality in Education: Insight from Different Perspectives*.
- Buccheri, G., Gürber, N. A., & Brühwiler, C. (2011). The impact of gender on interest in science topics and the choice of scientific and technical vocations. *International journal of science education*, 33(1), 159-178.
- Cai, L. L. (2013). The challenge and strategies of “county-centered” management system to rural compulsory education management. *Educational Science Research*, 7, 46–55.
- Chen, H. L., & Jing, C. (2002). Xuexiao benwei kechengfazhan xiangguan wenti jiqi xiangying cuoshi zhi yanjiu [A study of the problems and coping strategies for school-based curriculum development]. *Shida xuebao: jiaoyu lei*, 47(1), 1–16.
- Chen, H. L. S., & Yu, P. (2016). Closing achievement gaps and beyond: teachers’ reactions to the remedial education policy in Taiwan. *Asia Pacific Education Review*, 17(4), 609-624.
- Chen, L. Zh. (2007). Lun ziyuan fenpei yu jiaoyu jihuijundeng zhi guanxi: yi guominjiaoyu weili [Does Money Matter?: On the Relationship between Resource Distribution and Equality of Educational Opportunity in Taiwan]. *Jiaoyu yanjiu yu fazhan yukan*, 3(3), 33-54.
- Cheong Cheng, Y. (2009). Hong Kong educational reforms in the last decade: Reform syndrome and new developments. *International Journal of Educational Management*, 23(1), 65-86.

- Cheng, K. S. Y., & Jacob, W. J. (2016). A study of educational policies relating to afterschool programs and educational equality in Taiwan. In *Chinese Education Models in a Global Age* (pp. 65-75). Springer Singapore.
- Cheng, L., Su, S. Y., Pang, Y. N., & Chen, J. (2012). The Influential Factors of Private Mathematics Tutoring of Elementary and Secondary Students in Beijing. *Journal of Educational Studies*, 8(1), 67-73.
- Cheng, Q., & Hsu, H. Y. (2016). Low SES and high mathematics achievement: A two-level analysis of the paradox in six Asian education systems. *Journal of Education and Human Development*, 5(1), 77-85.
- Cheng, S. T., & Kaplowitz, S. A. (2016). Family economic status, cultural capital, and academic achievement: The case of Taiwan. *International Journal of Educational Development*, 49, 271-278.
- Cheng, S. Y. (2011). A study on the educational equity indicators for disadvantaged students. *Educational Policy Forums*, 14(4), 63-88.
- Cheng, S. Y. (2013). A study on disadvantaged students and remedial teaching. *Educators and Professional Development*, 30(1), 13-26.
- Chiu, H. N. (2010). The educational priority areas project: A case study in the United Kingdom and Taiwan. *E-Society Journal*, 87, A5. Retrieved December 22, 2017 from <http://www.nhu.edu.tw/~society/e-j/87/A5.htm>.
- Chiu, M. M., & McBride-Chang, C. (2006). Gender, context, and reading: A comparison of students in 43 countries. *Scientific studies of reading*, 10(4), 331-362.
- Chung, K. K., Liu, H., McBride, C., Wong, A. M. Y., & Lo, J. C. (2017). How socioeconomic status, executive functioning and verbal interactions contribute to early academic achievement in Chinese children. *Educational Psychology*, 37(4), 402-420.
- Coleman, J. S. (1966). Equality of educational opportunity.

- Croft, A. (2010). Consortium for Research on Educational Access, Transitions, and Equity. *Including Disabled Children in Learning: Challenges in Developing Countries. CREATE Pathways to Access. Research Monograph, 36.*
- Delen, E., & Bulut, O. (2011). The relationship between students' exposure to technology and their achievement in science and math. *TOJET: The Turkish Online Journal of Educational Technology, 10(3).*
- Duarte, J., Bos, M. S., & Moreno, M. (2010). *Inequity in School Achievement in Latin America: Multilevel Analysis of SERCE results according to the socioeconomic status of students.* Inter-American Development Bank.
- Dupriez, V., & Dumay, X. (2006). Inequalities in school systems: effect of school structure or of society structure? *Comparative education, 42(02), 243-260.*
- Education Commission. (2000). Reform Proposals for the Education System in Hong Kong. Hong Kong: Government Printer.
- Fan, L. P., & Li, X. Y. (2010). Analysis on the “new mechanism” of rural compulsory fund guarantee system. *Journal of Zhongnan University of Economic and Law, 5, 68–73.*
- Fan, S., Zhang, L., & Zhang, X. (2004). Reforms, investment, and poverty in rural China. *Economic Development and Cultural Change, 52(2), 395-421.*
- Farrell, J. P. (1997). Social equality and educational planning in developing nations. *International encyclopedia of the sociology of education, 473-479.*
- Fashola, O. S. (2002). *Building effective afterschool programs.* Corwin Press.
- Goldhaber, D. D., & Brewer, D. J. (2000). Does teacher certification matter? High school teacher certification status and student achievement. *Educational evaluation and policy analysis, 22(2), 129-145.*
- Goodstadt, L. F. (2014). *Poverty in the midst of affluence: How Hong Kong mismanaged its prosperity.* Hong Kong University Press.

- Guo, F. (1994). Jiating shejing diwei yu xueyuechengjiu zhi guanxi: houshe fenxi [The Relationship between Family Social Status and Academic Achievement: Post – analysis]. *Education Research Information*, 3(2), 38-47.
- Guo, J. (2011). Family and Parent Correlates of Educational Achievement: Migrant Children in China. *Asian Social Work and Policy Review*, 5(2), 123–137.
- Han, W. J., Huang, C. C., & Garfinkel, I. (2003). The importance of family structure and family income on family's educational expenditure and children's college attendance: Empirical evidence from Taiwan. *Journal of Family Issues*, 24(6), 753-786.
- Hannum, E., & Park, A. (2002). Educating China's Rural Children for the 21st Century. Harvard China Forum.
- Ho, E. S. C. (2006). Social Disparity of Family Involvement in Hong Kong: Effect of Family Resources and Family Network. *School Community Journal*, 16(2), 7-26.
- Ho, E. S. C. (2010). Assessing the quality and equality of Hong Kong basic education results from PISA 2000+ to PISA 2006. *Frontiers of Education in China*, 5(2), 238-257.
- Ho, H. F., & Lin, L. C. (2012). The all-in-one human resource policy of Taiwan's Hand-in-Hand Program. *Educational Research for Policy and Practice*, 1-9.
- Hong Kong Government (1981). The Hong Kong education system.
http://www.edb.gov.hk/attachment/en/about-edb/publications-stat/major-reports/edsys_e.pdf. Accessed 01 January 2018.
- Hong, L. Y. (2001). Yiwujiaoyu jieduan zhi ruoshi xuesheng de bujiu jiaoyu zhi diaocha yanjiu [The Study of Remedial Education for the Disadvantaged Students of Compulsory Education]. *Shida xuebao: jiaoyulei*.
- Hou, C. W., et al. (2008). *Effectiveness of after-school academic support program implementation: A report from the local administrative officers*. Paper presented at the annual conference of Taiwan Association for Sociology of Education, Chiayi, Taiwan.

- Howlett, Bob. (Ed). (1998). *Hong Kong - A new era*. Hong Kong: Information Services Department, Hong Kong Special Administration Region.
- Hung, C. L. (2007). Family, schools and Taiwanese children's outcomes. *Educational Research*, 49(2), 115-125.
- Huang, M. H. (2015). Xuesheng shuxue biao xian de chengxiang chayi [Rural-nonrural differences in student mathematics performance]. *Bulletin of Educational Research*, 61(4), 33–61.
- Huang, M. H. (2017). Excellence without Equity in Student Mathematics Performance: The Case of Taiwan from an International Perspective. *Comparative Education Review*, 61(2), 391-412.
- Hung, C. L., & Marjoribanks*, K. (2005). Parents, teachers and children's school outcomes: A Taiwanese study. *Educational Studies*, 31(1), 3-13.
- Kalaycioglu, D. B. (2015). The Influence of Socioeconomic Status, Self-Efficacy, and Anxiety on Mathematics Achievement in England, Greece, Hong Kong, the Netherlands, Turkey, and the USA. *Educational Sciences: Theory and Practice*, 15(5), 1391-1401.
- Lee, W. O., & Manzon, M. (2014). The issue of equity and quality of education in Hong Kong. *The Asia-Pacific Education Researcher*, 23(4), 823-833.
- Leung, A. K. C. (2000). Foreword. Learning for life, learning through life. pp. i-ii). *Hong Kong: Education Commission*.
- Li, C. (2003). Social and political changes and inequality in educational opportunities: on the impact of family background and institutional factors on educational attainment (1940–2001). *Social Sciences in China*, 24(4), 62-80.
- Li, Q., Ni, Y., & Li, X. (2011). Educational equity in a new curriculum reform environment: the effect of socio-economic status on student achievement. *Global Education*, 4, 25-32.

- Lin, C. Y. (2007). *The Impact of Individual-family and School Factors on Students' Academic Achievement: To Analyze the Educational Equality and the Relevant Issues of Junior High School Levels in Terms of SEM*, Unpublished Doctoral Dissertation. Unpublished Doctoral Dissertation. *National Kaohsiung Normal University, Kaohsiung, Taiwan.*
- Liu, M. X., Murphy, R., Tao, R., & An, X. H. (2009). Education management and performance after rural education finance reform: Evidence from Western China. *International Journal of Educational Development*, 29, 463–473.
- Liu, X., & Lu, K. (2008). Student performance and family socioeconomic status: Results from a survey of compulsory education in Western China. *Chinese Education & Society*, 41(5), 70-83.
- Liu, Y. K. R. (1998). *The implementation of a cognitive teaching approach to games in Hong Kong* (Doctoral dissertation, © Yuk-kwong Raymond Liu).
- Lo, L. N. (1999). Quality and equality in the educational development of Hong Kong and the Chinese Mainland. *Educational Research Journal*, 14(1), 13-48.
- Luk, B. H. (1990). Privatization and meritocracy: The real issue of the direct subsidy scheme. *Differences and identities: Educational argument in late twentieth century Hong Kong*, 47-55.
- Luo, F., & Zhang, Y. (2017). Probing the SES-achievement connection in the fast-changing society of China: a comparison of urban, rural, and migrant students. *Asia Pacific Education Review*, 18(1), 101-113.
- Ministry of Education, People's Republic of China (Ed.). (1998). *Educational development in China*. Beijing: Ministry of Education, People's Republic of China.
- Ministry of Education. (2006). *The guidelines of the Hand-in-Hand After-School Care Program*. Taipei: The Taiwan Government.

- Mok, J. K. H., & Chan, D. K. K. (2001). *Globalization and education: The quest for quality education in Hong Kong* (Vol. 1). Hong Kong University Press.
- Mok, K. H., Wong, Y. C., & Zhang, X. (2009). When marketization and privatization clash with socialist ideals: Educational inequality in Urban China. *International Journal of Educational Development*, 29(5), 505-512.
- Niu, Z. K. (2011). Changes of policies and management of basic education in INRULED, experience of universalizing nine year compulsory education in rural areas in China.
- OECD. (2004). *Learning for Tomorrow's World - First Results from PISA 2003*, OECD, Paris.
- OECD. (2007a). *PISA 2006 Science Competencies for Tomorrow's World Volume 1: Analysis*, OECD, Paris.
- Pan, L., & Du, D. (2009). Nongcun zhongxiaoxuesheng changrenzhi fengge, xueyechengji yu jiating shehuijingji diwei de guanxi [The relationship between field cognitive styles, academic achievement and family social economic status of primary and secondary students in rural areas]. *China Journal of Health Psychology*, 16(4), 439-441.
- Pang, W., Xu, X., Lin, L., & Ren, Y. (2013). The impact of family socioeconomic status on students' academic achievement. *Global Education*, 2, 12-21.
- Park, A., & Hannum, E. (2001). Do teachers affect learning in developing countries? Evidence from matched student-teacher data from China. In *Conference Rethinking Social Science Research on the Developing World in the 21st Century*.
- Phillipson, S. (2010). Parental Role in Relation to Students' Cognitive Ability Towards Academic Achievement in Hong Kong. *Asia-Pacific Education Researcher (De La Salle University Manila)*, 19(2).
- Pong, S. L., & Post, D. (1991). Trends in gender and family background effects on school attainment: The case of Hong Kong. *British Journal of Sociology*, 249-271.

- Poon, A. Y., & Wong, Y. C. (2008). Education reform in Hong Kong: The “Through-Road” model and its societal consequences. *International Review of Education*, 54(1), 33-55.
- Poon, A. Y., & Wong, Y. C. (2008). Policy changes and impact of the education reform in Hong Kong. *Shida xuebao: jiaoyu lei*, 53(3), 47-65.
- Qiu, S. X. (2009). Jiaoyu youxianqu zhengce bianqian zhi yanjiu [A Study on the Policy Changes of Education Priority Areas]. *Guoli taibei jiaoyu daxue jiaoyuzhengce yu guanli yanjiusuo xuewei lunwen*, 1-215.
- Qiu, X. N. (2010). Qiantan jiaoyu youxianqu – yi yingguo yu taiwan weili [Discussion on Educational Priority Areas – Taking England and Taiwan as Examples]. *Wanglu shehuixue tongxun qikan*, 87, 1-16.
- Rawls, John. (1972). *A Theory of Justice*. Oxford: Oxford University Press.
- Reardon, S. F. (2013). The widening income achievement gap. *Educational Leadership*, 70, 10–16.
- Ren, Ch., & Xin, T. (2013). Jiating shehui jingji diwei dui xiaoxuesheng chengji yuce xiaoying de zhuizong yanjiu [Longitudinal Study on Predicting Effect of Social Economic Status on Students’ Performance]. *Educational Research*, (3), 79-87.
- Ren, Y., Yang, X., Wang, M., Zhao, J., Pang, W., & Lin, L. (2012) Woguo wu chengshi chuzhongsheng xueyechengjiu jiqi yingxiangyinsu de yanjiu [Research on academic achievement and its influential factors among secondary students in five capital cities in China]. *Educational Research*, 11, 36-44.
- Schutz, G., Martin, R.W., & Wobmann, L. (2007). *School accountability, Autonomy, Choice, and the Equity of Student Achievement: International Evidence from PISA 2003*. Paris: OECD.

- Shi, B., & Shen, J. (2007). Jiating shehui jingji diwei, zhili he neibu dongji yu chuangzaoxing de guanxi [The relationships among family SES, intelligence, intrinsic motivation and creativity]. *Psychological Development and Education*, 23(1), 30-34.
- Sirin, S. (2005). Socio-economic status and academic achievement: A meta-analytic review of research. *Review of Educational Research*, 75(3), 417-53.
- Stronge, J. H. (2007). *Qualities of effective teachers*. ASCD.
- Sun, L., Bradley, K. D., & Akers, K. (2012). A multilevel modelling approach to investigating factors impacting science achievement for secondary school students: PISA Hong Kong sample. *International Journal of Science Education*, 34(14), 2107-2125.
- Sun, Zh. (1999). Xueye shibai wenti de jiating shehui jingji diwei yanjiu [Research on academic failure and family socioeconomic status]. *Tsinghua University Education Research*, 20(1), 47-51.
- Sun, Z. J., Liu, Z. Y., & Sun, B. C. (2009). Children's achievements and their families and schools: A study based on the rural areas in Gansu Province. *Journal of Beijing Normal University (Social Sciences)*, 5, 103-115.
- Sung, Y. T., Tseng, F. L., Kuo, N. P., Chang, T. Y., & Chiou, J. M. (2014). Evaluating the effects of programs for reducing achievement gaps: A case study in Taiwan. *Asia Pacific Education Review*, 15(1), 99-113.
- Tam, V. C., & Chan, R. M. (2009). Parental Involvement in Primary Children's Homework in Hong Kong. *School Community Journal*, 19(2), 81-100.
- Tao, H., & Yang, D. P. (2007). Woguo gaozhong xuesheng xueyechengjiu yu jiatingbeijing guanxi de shizheng yanjiu [An empirical analysis of the relationship between educational achievement and family background of high school students]. *Tsinghua Journal of Education*, 28(1), 29-33.

- Task Force. (2008). *The rising of a country through education (1978–2008)*. Beijing: Educational Science Publishing House.
- Tsai, J. S. (2000). The idea and direction of implementation of educational priority area. *Newsletter for Teaching the Humanities and Social Sciences*, 10(5), 160–170.
- Tse, T. K. C. (2008). Choices for whom? The rhetoric and reality of the direct subsidy scheme in Hong Kong (1988-2006). *Education and Urban Society*, 40(5), 628-652.
- Wang, B. (2008). Jiatingbeijing dui zinv shoujiaoyu chengdu de yingxiang [Effects of Family Background on Their Children's Education Level]. *Journal of Anqing Teachers College (Social Science Edition)*, 27(3), 44-47.
- Wang, D. B. (2004). Family background factors and mathematics success: A comparison of Chinese and US students. *International Journal of Educational Research*, 41(1), 40-54.
- Wang, L., & Lewin, K. (2016). Two Decades of Basic Education in Rural China.
- Wen, D. (2005). Jiatingbeijing dui woguo gaodengjiaoyu jihui ji biyesheng jiuye de yingxiang [The impacts of SES on higher education opportunity and graduate employment in China]. *Peking University Education Review*, 3(3), 58–63.
- White, K. R. (1982). The relation between socioeconomic status and academic achievement. *Psychological bulletin*, 91(3), 461.
- Wößmann, L. (2005). Educational production in East Asia: The impact of family background and schooling policies on student performance. *German Economic Review*, 6(3), 331-353.
- Wu, C. C. (2009). Higher education expansion and low-income students in Taiwan. *International Journal of Educational Development*, 29(4), 399-405.
- Wu, X. (2010). Economic transition, school expansion and educational inequality in China, 1990–2000. *Research in Social Stratification and Mobility*, 28(1), 91-108.
- Xuedong, D. (2008). The development of compulsory education finance in rural China. *Chinese Education & Society*, 41(1), 51-57.

- Yang, F. T. (2009). Jiaoyu youxianqu de jiantao yu gaige [The problems of Educational Area and Try to Find Suitable Strategies to Improve the Reality]. *Mingchuan jiaoyu dianzi qikan, chuankanhao*, 114-125.
- Ye, Y. C. (2010). The effects of parental involvement on pupils' academic achievement. Northwest Normal University. (in Chinese)
- Yuan, G. L. (2004). Achievement and problems in the implementation of the "new mechanism". *People's Education*, 22, 80-86.
- Zhao, N., Valcke, M., Desoete, A., Verhaeghe, J., & Xu, K. (2011). A multilevel analysis on predicting mathematics performance in Chinese primary schools: Implications for practice. *Asia-Pacific Education Researcher*, 20(3), 503-520.
- Zhang, J. S. (2004). Investment in rural compulsory education: Duty of the state. *Journal of Public Management Science*, 5, 46-48.
- Zhang, T., & Minxia, Z. (2006). Universalizing nine-year compulsory education for poverty reduction in rural China. *International review of education*, 52(3-4), 261-286.
- Zhao, X. (2009). A study on the elementary school hand-in-hand after school care program in Pingdon County (unpublished master thesis). Pingdon, Taiwan: Pingdon Educational University.
- Zhou, Y., & Wang, D. (2015). The family socioeconomic effect on extra lessons in Greater China: A comparison between Shanghai, Taiwan, Hong Kong, and Macao. *The Asia-Pacific Education Researcher*, 24(2), 363-377.
- Zhou, Y., Wong, Y. L., & Li, W. (2015). Educational choice and marketization in Hong Kong: the case of direct subsidy scheme schools. *Asia Pacific Education Review*, 16(4), 627-636.