

The Effect of Large and Small Class Size in Compulsory Education in China

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Abstract

This paper discusses the advantages and disadvantages of a large class and a small class of the compulsory education stage by summarizing the literature in China and abroad. The paper concludes past international and domestic studies, such as the STAR project in the United States, and studies of class size since 2000 to the present in other countries and China, the impact of teachers and schools, and what conditions apply to large small classes. By analyzing the effects of large and small class sizes on students, teachers, and schools, generally speaking, small class teaching helps cultivate students' personalities. Students can communicate with teachers effectively, with an improvement in teaching efficiency. However, the popularization of small class teaching needs a lot of financial and personnel support. Alternatively, in large class teaching, building a good learning atmosphere can make students cooperate. The disadvantage of large class teaching is the low participation of students; too many students will lead to increasing pressure on teachers. The paper sums up that whether large or small class teaching, according to different circumstances, using flexibility will positively affect students. On the contrary, if the classroom size is not suitable, it could negatively influence.

Keywords: *Small Class Size, Large Class Size, Compulsory Education.*

1. Introduction

Since the People's Republic of China's founding ceremony, progressively more attention has been given to education. From the beginning of the compulsory education system, there have always been excessive discussions of class size (He, 2017). It showed that there were three main stages for class size management in China. The first stage was visualizing, from the end of the 1980s to the mid-1990s. It was the small class research and practice stage mainly studied from other countries. Some researchers believed that reducing class size is the main choice for the reform of small class teaching in China. In this period, China imported the research on small class size teaching from other countries. In short, this period was still in the embryonic stage (Yang, 2012).

The second stage was the experimental research and the promotion stage, from the mid-1990s to the early 2000s. In this period, the Chinese government began to experiment and practice (Gu, 2003). For example, the Shanghai government started experimenting with 279 primary schools in the city, a small class pilot to support government policy, and relevant training for teachers (Zhai, 2003). Along with the small class size teaching experience, they were progressively conducting more research. The study of small class size teaching in China focused on the summary of relevant experience, the large-scale practical exploration, and the theoretical overview; the introduction of other countries-related research results and the combination with the local teachers.

At the beginning of the 21st century, China began a new round of basic education curriculum reform in the third stage. It means the coming of a significant change of educational thoughts and ideas. Based on this background, people began to study small class size practices taught from many angles (Wu & Zhou, 2017). Some scholars believed that teachers should have more vital classroom organization and management ability to implement small class size teaching. Students should have the ability to self-study, think, and operate (Yu, 2019). Through the existing teaching facilities and resources, it is observed that small class teaching is not everywhere in China, and not all schools have the conditions to implement it.

By the middle of the 21st century, with the appearance of super-large class size and the increasing demand for the quality of education, researchers began to study the causes and solutions of how to reduce class size and large class size (Yin, 2017; Zhu, 2017). With the progress of Chinese society, people no longer pursue small class teaching, but instead explore what kind of prerequisite backgrounds, such as students of different ages, different regions, and various subjects, to choose the appropriate class capacity for teaching, to maximize the benefits to student achievement (Song, 2020).

1.1 Class size

Class size or class capacity refers to the number of students studying in the same classroom (Zhu, 2017). It is a class teaching organized form of a basic element. When the class size is too large or too small for teaching activities, it will impact teaching activities (Ma, 2009). According to the literature, class size study in China is lagging. The study of class size has emerged gradually since the 1990s (Feng & Zhang, 2017). According to the Statistical Yearbook of China's Education, the size of classes in primary and secondary schools is set into five sizes: 25 students, 36-45 students, 46-55 students, 56-66 students, and more than 66 students per class. Based on the situation of China and the present class capacity, this study defines 20-30 students as a small class, 30-50 students as middle class, and 50 or more students as large class.

China's compulsory education has always been managed by large class sizes, which are far larger than in other countries (Organization for Economic Co-operation and Development [OECD], 2012). Using comparable data from all OECD countries, it is found that the average class size in junior high schools is 23 students. The class size varies from country to country, as little as 20 or fewer in one class (such as Denmark, Estonia, Finland,

Iceland, Luxembourg, Slovenia, Switzerland (public schools), and the UK). As many as 32 in some countries (such as Japan and South Korea), China has more than 50 (OECD, 2012).

Regarding the OECD study (2012), the class size has become one of the debatable issues as it could affect the quality of curriculum and instructional management and the school budget. As a result, it had a direct impact on student's academic achievement. All teachers are challenged with the fundamental problem of establishing and maintaining order in the classroom (Ehrenberg et al, 2001). Teachers are more concerned about the influence of class size on students' achievement and teaching effectiveness, while administrators are concerned about the economic benefits of increasing class size. In Owoeye & Yara's (2011) opinion, class size is mainly based on the administrator's plan; teachers hardly control it. Class size is also one of the most concerning educational policies. Schanzenbach's study in 2014 demonstrated that the class size would have a positive influence on student achievement in the future.

Concerns about class size among schools and teachers: Parents who are more concerned about their children's education also pay attention to it. They may choose small-class schools for their children (De Paola et al, 2013). The researchers said in an interview, possibly because respondents believe that small class teaching promotes student learning, or simply because small classes provide a more comfortable environment for students and teachers (Angrist & Lavy, 1999). In some cases, however, parents do not have the option of placing their children in large or small classes, and it is usually the school that assigns the children (De Paola et al, 2013).

In addition, specific policies or practices may have different effects on different types of students. In small classes, teachers can spend more time with students who have difficulty with classroom content or deal with discipline problems caused by children with behavioral issues (Huo, 2019). Therefore, small classes' benefits may be better for students with lower cognitive abilities than for more capable students and classrooms that include some children with behavioral disorders; the benefits of small class instruction are greater than those of classes without such children. However, large class teaching has its advantages. Students can interact and learn to promote the entire class's development (Ehrenberg et al, 2001).

In conclusion, the difference in class size impacts teaching practices and students' academic performance (Zheng & Yang, 2018). There are several reasons why different class sizes may improve performance, including better teacher-parent relationships and more personal teacher-student relationships (Wang, 2018). According to this statement, class size and teaching practices can influence each other and thus students' academic performance.

1.2 Compulsory education

In China, compulsory education is universal, mandatory, and free education for all children and adolescents of the appropriate age in accordance with the law. It is the basis for improving the nation's quality and the starting point for achieving social equity.

Compulsory education of the People's Republic of China was adopted by the fourth session of the 6th National People's Congress in 1986. Compulsory education has been a top priority for China's education reform and development. Based on Yin (2019), the three essential natures of compulsory education are free, unity, and compulsory. Free education means "No tuition fees, miscellaneous fees" (p.7). The country implements the compulsory education system. The compulsory education is a unified national implementation for all school-aged children and adolescents, they must receive an education, and the state must protect public welfare undertakings. There will be no tuition or other fees for the students under the age of compulsory education. Unity includes establishing a unified compulsory education textbook setting standards, teaching standards, funding standards, construction standards, student public funding standards. Compulsory education means the duty of schools, parents, and society to ensure that children under the proper age going to school to study. Whoever violates this obligation is subject to the rule of law. Parents are expected by the law to send school-aged children to school, and schools are required to provide school space for children.

1.3 Current situation in China

On April 16, 1982, the Ministry of Education of China issued the quota for the planning area of secondary normal schools and urban general primary and secondary schools. It stipulates that the number of students in one classroom in junior high schools shall be 50 in the short term and 45 in the long term. The number of students per class in primary schools is 45 in the short term and 40 in the long term. However, because of the imbalance of educational resources and other reasons, some schools, class capacity seriously exceeded the standard (Gu, 2011).

Firstly, the progress of urban school construction and urbanization is not suited. In recent years, the pace of urbanization has been accelerating. The city's scale has been expanding. The population from surrounding counties has been pouring into the city; the number of migrant workers and their accompanying children has increased yearly (Wang, 2017). In accordance with the "Two-oriented" principles of government management and public-school acceptance, the number of migrant children accepted by public schools has been increasing. According to statistics, the number of registered students outside the urban area has accounted for nearly 50%. Secondly, the uneven development of education mainly reflects the imbalance of education resources between the city and county. There are significant differences among schools; in the conditions of running schools, the level of teachers, and the quality of education (Ding, 2017). Quality schools are overcrowded, and the resources of ordinary schools are idle. Thirdly, the layout of the school is not reasonable; the number of standardized schools is insufficient. In primary and secondary schools in urban areas, many streets, communities, and private schools were banned because they did not meet compulsory education requirements. In some areas, schools that meet the mandatory education criteria do not enroll students because of their location or other factors (Zhang, 2019).

All these problems lead to the uneven distribution of educational resources. To solve this problem, the Provincial-level Government of the People's Republic of China shall

formulate special plans to eliminate large class sizes considering local conditions. By specifying their tasks, timetables, and road maps, eliminating super-large class sizes with 66 or more personnel by 2018 and 56 or more personnel by 2020 (Fan, 2018). At the same time, a lot of research on class capacity is also constantly updated. Studies showed that class size could have both advantages and disadvantages due to many factors, such as students' background, family background, etc. However, class size change determinants depend on students' achievements and teachers' job satisfaction (Owoeye & Yara, 2011). Putting the appropriate class capacity in a suitable classroom has become one of the determinants of whether school education can effectively influence students' future.

2. Previous Studies on Class Size in other Countries

In the study of class size, American research is the most prominent. Among the often-used programs are The Student/Teacher Achievement Ratio (STAR) program in 1996, Wisconsin's SAGE, and California's CSR program.

2.1 The student/teacher achievement ratio (STAR)

The STAR experiment in Tennessee was regarded as a milestone in this field. Many researchers in the United States considered this project a crucial educational experiment in American education history. In the STAR program, 11,500 students and 1,300 teachers at 79 Tennessee elementary schools were randomly assigned to small or regular classes over four years, starting in 1985. The students took part in the experiment from kindergarten through the third grade of primary school. The project results clearly showed that students scored 5 percent higher on standardized math and reading tests in the class with 13-17 students rather than a regular class with 22-25 students (Gao, 2017). Also, small classes benefit students from families with lower socioeconomic status.

Meanwhile, the STAR study found that teachers use various learning-enhancing methods; classes with small size enable them to use these strategies more effectively. In math classes, for example, the teacher closely monitors students' progress in the classroom. When children did not learn a concept, teachers can focus on individual students, re-teach, and maintain superior personal interactions (Tao, 2013).

2.2 Other studies

Many studies explore class size's effect on students' achievement and performance (Zhang, 2009; Wen, 2018; Yu, 2019; An, 2019). In contrast, others have found no correlation between large and small class teaching and students' achievement and future development (Zheng & Yang, 2018; Zheng, 2020).

Some studies have found that reducing class size can improve students' performance and impact their future development (Wen, 2018; Yu, 2019). Class size is an essential factor in determining student achievement and a factor that government can determine directly (An, 2019). On the other hand, increasing class size may hurt students' performance in the class. The study found that students in large class sizes were more likely to have undesirable classroom behaviors, such as inattention, talking, reading extra-curricular books, bullying, and doing other subjects' homework, including sleeping and

being late. These behaviors will lead to the decrease of students' efficiency in class and affect students' achievement and performance (Zhang, 2009).

Similarly, there is evidence that class size increases not only undermine children's test scores in the short run but also their long-term human capital formation (Fredriksson et al, 2013). De Paola et al (2013) showed that large class sizes had a significant and considerable negative impact on students' math scores for math and language-related subjects. Notably, the adverse effects were significant for low-ability students and negligible for high-ability students.

Several studies have found that small class teaching does not improve students' academic performance. According to Owoeye & Yara's (2011), who studied class size in Nigerian secondary schools, there was no significant difference in academic achievement between urban small and large classes and rural large and rural small classes. Other studies have found no difference in students' performance until class size drops to 10 or fewer. These findings suggest that a gradual reduction in class size may not significantly impact students' later academic performance (Wyss et al, 2007). Similar studies in China have found that class size does not substantially affect students for some subjects. Dai (2013) found that class size and student type were not significantly related to the English classroom.

3. Advantages and Disadvantages for Small Class Size

Most of the research mentioned that small class size is better for students and teachers (Cuseo, 2007; Wang, 2008; Zhang, 2009; Lv, 2015; Huo, 2019). However, small class size may not be as good as using a large class size in teaching for all situations. Following are the advantages and disadvantages of small class sizes in compulsory education.

3.1 Advantages

Firstly, from the student's perspective, small class size teaching is beneficial for developing students' individuality and cultivating their creativity. Huo (2019) pointed out that small class teaching reduces the proportion of students and teachers. It integrated the advantages of group education and individual education so that students' personality awareness and personality ability can be better cultivated and developed. Secondly, the students can build creative thinking and critical thinking; the course is based on the learner-centered ideology. Under the premise of small class teaching, teachers can let all students participate in the whole teaching activity process, give full play to students' main role, and cultivate students' creative ability (Lv, 2015). Teachers are called helpers, not coaches, mentors, and lecturers. The teacher gives very few lectures but leaves more time for students to think and analyze themselves (Cuseo, 2007). Small class students' curriculum satisfaction is high (Zhang, 2009). The desire and frequency of speaking out in a class, the relationship with teachers, and self-awareness are also better than large class students (Wang, 2008). Thirdly, promoting equity in education, teaching opportunities are equal. In small class teaching, each class will not have more than 30 students, so teachers have the ability and energy to pay attention to each student's need. Because each student can get the

teacher's care and guidance, it can improve teaching effectiveness and ensure students' goals in the education process (Huo, 2019).

From the teacher's perspective, firstly, they can promote teacher-student communication and teachers' academic competence; teachers are no longer simply teaching knowledge (Lv, 2015). Teacher's responsibility is now less and less to pass on knowledge. He or she will become a consultant, an opinion interlocutor, who helps find contradictory arguments rather than turning them into truth. Under the background of the change of class size in China, teachers need to be more involved in lesson preparation and teaching activities because of the need to pay attention to each student's development. Secondly, teachers are more flexible. They can change the material according to the student's level of needs and improve their abilities (Zhang, 2009).

From the perspective of the school, standards of teaching resources have been raised. In resource allocation, small class size means improving classroom teaching space and time conditions and implies enhancing educational resources, such as school size, school building area, and sports ground area (Zhou, 2001).

In general, small class teaching helps develop students' personality, creativity, and critical thinking ability; every student can communicate with the teacher and get guidance, which can improve teaching effectiveness.

3.2 Disadvantages

Judging from the current educational reform trends, education's value orientation has gradually shifted from attaching importance to transmitting knowledge from the book to pursuing human beings' overall development (Wang, 2017). It is necessary to change the teaching organization from mass-production teaching to individualized teaching, and the small class teaching is in line with its development direction (Lv, 2015). However, there are some disadvantages to small class size teaching.

In China, the main problem that leads to the large class size is the large population and a large student population. If small classes are randomly popularized, there are bound to be many children who do not enjoy compulsory education (Zhou, 2001). However, China faces exam-oriented education, compulsory education is not entirely universal, and small class teaching has increased the compulsory education burden. Taking care of every student during instruction will lead to small class teaching progress slowly. Under the favorable conditions of small class size, the teacher's ability to control the students is greatly strengthened. The students have enough time to complete the understanding and mastery of knowledge in the classroom. The teacher will slow down the pace in small class teaching and let the students learn slowly; teaching time and teaching content are strict requirements (Wang, 2017).

Another reason for the difficulty of small class teaching in China is that state investment in compulsory education, especially rural basic education, is inadequate. The number of small class teaching has increased the burden of mandatory schooling. Reducing

class size requires enormous amounts of financial support (Ding, 2017). Researchers cannot estimate exactly how much money might be needed to shrink the size of primary and secondary school classes. In short, the reduction of class size means recruiting many new teachers, teacher training, teaching, and significantly increased funding, which will inevitably lead to the income decrease of existing teachers.

Generally speaking, small class teaching will increase the burden of compulsory education due to China's large population and many students. At the same time, it will be challenging to carry out small class teaching because of insufficient financial input in some places, such as rural areas.

4. Advantages and Disadvantages for Large Class Size

Large class sizes can have both benefits and shortcomings for the students, teachers, and the school. Following are the advantages and disadvantages of large class sizes.

4.1 Advantages

From the student's perspective, in large size class teaching, there is diversity among students. Learning levels differ, which may cause a collision of ideas; students can learn from each other, significantly increasing cooperation. Secondly, it fosters a sense of competition and provides more options and flexibility in the face of problems. Lastly, students can develop communicative competence (Wang, 2008). For example, teachers pay attention to classroom interaction during English courses by providing students with listening, speaking, and practice. Thus, creating a comfortable climate for students to talk in English helping students develop speaking skills, enhancing students' confidence in English (Dai, 2013).

From the teacher's perspective, in the background of large class size, they need a large amount of course preparation, set up homework, teaching, and research tasks daily, increasing self-challenge and increasing teaching ability. In large class sizes, adopting democratic management in the teaching management class can improve good relationships (Wang, 2008).

From the school perspective, teaching resources are fully utilized. Maintaining a unified educational function and reducing students' unit costs will produce economies of scale in education. But there are limits to expansion; Yin (2019) mentioned that the development of education in China is to make sure that all children under school age can attend school.

In short, in large class teaching, students can learn from each other, create a good learning atmosphere, and increase the sense of cooperation and competition.

4.2 Disadvantages

From the student's point of view, participation was low because they had less time to focus and could not participate effectively in class discussions with their teachers. Cuseo's (2007) research mentioned that large class size is based on teacher-centered

learning, single input knowledge, lessens the depth of the student's thinking. Due to the excessive number of students in the classroom; small space; students' independent choice of learning methods, the conditions for teachers to innovate teaching methods are minimal. Students do not have sufficient opportunities to speak and perform in the classroom; this leads to ineffective teaching and untimely feedback. The class size is considered too large when it is not conducive to students' individualized education (Ye, 2000).

Also, research raised that large class sizes and interpersonal interactions matter. Researchers at the Northeast Normal University study on the relationship between teachers and students found a strong relationship between students' seating arrangements and communication with the teachers. The short distance between students and the teachers and their psychological distance is also relatively short (Pan & Li, 2006). The teachers can deliver their attention and expectations to the students through eye contact, expressions, and body language. By doing so, students can have emotional resonance psychologically, actively support and cooperate with teachers in action; it is easier for students to obtain the performance and praise of teachers. Academic performance is relatively good. However, students in the back row often have a negative attitude towards learning because of the distance between students and the teachers, which leads to the psychological distance between them. Related studies show that the negative impact of class size is significantly increased (Lu, 2001). Simultaneously, it limits the communication between teachers and students to a certain extent and may hinder teachers' guidance to students, affecting students' achievement.

For the teacher's side, Lu (2001) proposed that if the class size is too large, it will have psychological pressure on the teacher, affecting physical and mental health. For example, in primary schools and junior high schools in China, every class has a "Class sponsor," like a college counselor responsible for students' thoughts, study, health, and life at school. In other words, he or she is the class organizer, leader, and educator. In a large class, the class sponsor has more pressure than in small class size. In conclusion, the disadvantages for teachers in the large class size are:

- 1) Personal career development of the source of pressure: personal responsibility, title promotion issues, unreasonable daily assessment, curriculum reform pressure.
- 2) Work tasks of the source of pressure: examination pressure, pressure on the workload, time pressure (to deal with all kinds of examination and assessment, students' poor grades, students are challenging to manage).
- 3) Source of social pressure: the contradiction between high social expectation and teachers' status, the problem of salary and treatment, the disharmony with leaders, the competition of colleagues, incomprehension, and support of parents (Wen, 2007).

From the school perspective, class size is one of the objective factors that affect education equity. Too large class size leads to the inequality of educational opportunities, which leads to the disparity of students' learning opportunities (Li, 2003). In the large-sized

class, the obvious shortcoming is the student participation degree is low, while the teacher's pressure from work is high, they can not pay attention to each student, and the school also faces the management question.

5. Recommendations

By summarizing and studying the literature on class size in China and abroad, the author gives the following suggestions. First, renew the educational concept and perfect the educational system. Educational decision-makers should have a deep understanding of the urgency and necessity of controlling the size of classes and classes at the compulsory education stage, with the growth and development of student's physical and mental health as the fundamental goal and purpose of education. Through the study of literature, it is found that if the class size is too large, it will lead to the crowding of students' study space, affect the teaching quality and aggravate the working pressure of teachers, which will bring great difficulties to school management (Li, 2003).

Second, the consciousness of key schools should be appropriately diluted. In China's context, the inequity in education and the division of educational resources in recent years is mainly due to the influence of the concepts of "Key" and "Non-key" schools on parents. As parents pay more attention to their children's education, parents are eager to send their children to the "Key" schools. This situation has led to overcrowding in some schools and closure of others because there are no students in those "Non-key" schools (Wang, 2008). Therefore, the author proposes canceling the "Key" school policy, diluting the school hierarchy's sense, and trying to provide students at the compulsory education stage with a relatively fair and balanced teaching force.

Third, proper planning and distribution of schools in both rural areas and counties. Through increasing policy support and financial input to rural schools, the proportion of excellent teachers in rural areas will be strengthened so that children in rural areas can receive quality education locally, to promote educational equity. Finally, according to different subjects and students' level, we should arrange the teaching of a large class or small class reasonably, and try our best to accord with the idea that education should be based on students' needs, so that education can serve students.

6. Conclusion

The advantage of large class size is that in large class teaching, students' different backgrounds can bring about the collision of different ideas; students can learn from each other and promote each other. At the same time, large class teaching can cultivate students' competition consciousness and discover the knowledge of interpersonal communication in the collective life. The disadvantage is due to the large class size; teachers cannot pay attention to each student's need, which may lead to a single knowledge instillation and is not conducive to personalizing teaching students. Large class teaching also limits the communication between teachers and students to a certain extent, hinders teachers' guidance to students, and affects students' academic achievement. For teachers, if class size is too large, it will have psychological pressure on teachers, affecting their physical and mental health. To the school, the large class size teaching also has particular difficulty in

the management.

The advantage of small class teaching is that it is beneficial to pay attention to the students' personalities to cultivate their creativity. In the small class teaching, the student's participation in the class is higher, developing the student's critical thinking. In the small class teaching, the teacher can pay more attention to each student, adjust the teaching program according to the student's need, and truly teach the talented person. The main problem of small-class teaching in China is the shortage of resources due to overpopulation and numerous students. Shrinking class sizes means hiring more new teachers, teacher training, teaching, and a significant increase in funding.

Education is ultimately for the achievement of students. Students should be the need of the priority. Therefore, the school leader needs to manage: curriculum and instructions and class size, take complete account of geographical and policy factors, students' age and background factors, subject background, and characteristics to determine the size of a class, regardless of whether the class is large or small, put the right class size into the right place. The school administrator who takes charge of managing and deciding class size should make rational use of resources and combine with practical policies to ensure that education serves students equally.

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