

Historical Evolution and Enlightenment of Class Size Research in America

Zhao Sasa^{1,2,*}

¹Zibo Vocational Institute, Zibo, 255314, China

²Jeonbuk National University, Jeonju, 54896, South Korea
sasa1030@163.com

Abstract: Class size research in the United States is driven by two forces: one is to study the factors that affect the quality of education, the other is to explore the cost-benefit of class size reform. In the 1980s, Discussions of the research on small classes center around the STAR project. With the development of the study on the influence of small class size, scholars generally find that class size does not directly affect the teaching quality. Following the disadvantages of randomized educational experiments, the failure of California's small class reform has directly aroused critical reflection on small class sizes. Through this historical evolution, we can see that educational decision-making and educational research complement each other. Only by establishing dynamic and processive view of educational quality and fully considering social interests can education develop.

Keywords: America; Class Size; Historical Evolution

1. Introduction

Class-size studies in the United States, which emerged in the late 1970s, vividly demonstrate how to guarantee the benefits of educational investment and the quality of educational processes in educational reform. Reflecting on the relevant research and its evolution will have important implications for understanding the mechanism of class size on education quality and how education research interacts with educational decision-making.

2. Historical Development of Class Size Research in the United States

The wave of class size research in the United States began in 2At the beginning of the 20th century, American scholars paid more and more attention to controlling class size as an important means of coordinating resource efficiency. At the same time, influenced by decentralized educational management system, states have carried out a series of educational reform and experimental programs on class size to meet the needs of all parties in education development. In this process, American class size research is driven by two forces: one is to study the factors that affect the quality of education, the other is to study the cost-benefit of class size reform. The former is driven by educational scholars, parents and teacher groups, the latter by educational managers and educational decision-making consulting experts.

Much of the early research was done in the field. Mainly. Under the pressure of a surge in the enrollment population, one of the major questions to be solved in class size research is: Will larger classes have a negative impact on students' performance? These studies found that the larger classes did not have a negative impact on students' academic performance. On the contrary, individual studies found that the larger classes promoted students' academic performance. But this "false" approach to research quickly aroused discontent among educators. Some argue that studies focus only on student performance reflected in standardized tests, neglecting many difficult but important educational goals. Some researchers point out that it is difficult to reflect teachers' work input in classroom teaching. These counterarguments facilitate a re-examination of class size. The researchers began using group-controlled experiments such as Whitler and Weller in 24 primary school classes, with 20-person classes and 40-person classes The human classes were experimental group and control group respectively ^[1]. In the experiment, the researchers found that small classes were better than large classes.

Research in the 1960s focused on around the debate about efficiency and fairness in class size reform, the research of class size in the early 1970s focused on how to invest in education rationally. In this

process, some scholars no longer simply understand class size as a class size, but also consider class size from the perspective of teacher-student ratio. But this improvement in class size, dominated by teacher-student ratios, heralds more opportunities for improvement in the quality of education in public schools, prompting some liberals ^[2]. Some pedagogics point out that the lack of explanatory power in the past research is mainly due to the small sample size of the class. At the same time, the modern experimentalist paradigm, represented by McCaul, began to emerge. These two points become important theoretical prerequisites for large randomized experiments. The STAR program in Tennessee, for example, drew lessons from past research and design and divided the classes into control groups from the start. Regular classes (1 certified teacher and 20-26 students), control group regular classes (1 certified teacher, 20-26 students and 1 full-time professionally certified teacher assistant), and experimental group small classes (1 certified teacher and 13-17 students). This distribution method not only takes into account the number of students in the class, but also takes into account the influence of different teacher-student ratios in the design of the control group ^[3].

Following the STAR program, the U.S. states they followed Tennessee's example and began small-class reform, which culminated in the federal small-class program. The state government is trying to improve access to quality education through personalized teaching and higher average student funding, while at the same time reducing teachers' workload while controlling salaries. Under this background, small class becomes the choice of educational decision-making. California has introduced a large number of unaccredited teachers to reduce teacher-to-teacher ratios, and has even added temporary classrooms. As a result, instead of improving the quality of education, small-class reform has created teachers and teachers.

A decline in hardware levels. That's why American studies the community began to question the rationality of small class reform. By investigating the effectiveness of small class sizes, scholars generally conclude that the advantages of small class sizes are reflected in the lower school age, and whether small class sizes is implemented or not has no significant effect on education quality. In addition, the impact of small class sizes is greatly influenced by the social background of students, and economically disadvantaged groups, represented by ethnic minorities, benefit more from small class sizes reform than whites and middle class ^[4].

3. Class Size Effect Influences Education Reform in the United States Historical evolution

A Survey of Class Size in the United States, Related Understandings It has been influenced by institutional and scientific factors. On the contrary, the research on the influence of class size on education quality can reflect the whole nature of education ecology and reasonably understand the influence of class size on education quality. The interaction of these two demands impels the change of the mechanism of class size influencing the quality of education.

3.1 Cost-benefit mechanisms under the leadership of efficiency in the United

States Class size studies were initially developed in response to a surge in enrollment. Educational decision-making departments urgently need to find scientific basis to deal with this real problem, and scientific experimental design is not mature in this period, so class size of class is treated as an economic problem. Therefore, the influence of class size on the quality of education becomes a question of how to optimize the allocation of educational resources.

Faced with a surge in enrollment, early class sizes the research is mainly focused on large class size. Under the implementation of educational decision-makers, specialized educational research is only from the negative aspects to reflect on whether the expansion of class size can have a negative impact on students' academic performance. In 1932, the Northern Middle School Association released restrictions on the class size of middle and western high schools and allowed them to expand the class size ^[5]. At the same time, driven by achievement-led accountability, states generally emphasize equal opportunities for quality educational resources ^[6]. In order to realize this idea, some scholars have proposed that the class size should be defined from the number of students to the teacher-student ratio. This is because adjusting the teacher-student ratio can reduce unnecessary hardware input without reducing the class size, but also indirectly by adjusting the workload of teachers increased investment in per capita education ^[7]. At the same time as this kind of research, it is a long-term study on class size reform. Compared with the factors of school education, students' social and natural conditions often affect the effect of class size more. This view is generally accepted by the educational practice circle, which makes "cost-benefit" the mainstream explanation to measure class size effect.

3.2 Evidence-based Excavation Facilitated by the Pilot Project

Since the 1960s, with the decrease of enrollment population in the United States, the problems of sufficient education finance and resource pressure are gradually alleviated. The exploration of class size effect in this period also shows the distinctive characteristics of evidence-based research.

Education survey in the strict sense up to 20 It was only in the 1960s that America began to rise^[8]. The modern experimentalist paradigm has an important influence in the process of the empirical investigation going to the standardization. The core of this research paradigm is to ensure the scientific implementation of the randomized survey to avoid the policy-oriented sample selection bias^[9]. Early evidence-based research will focus on a reasonable class size. Through the study, Grice et al. found that 15 people were important nodes in the influence of class size on teaching quality^[10]. But this kind of research is only a kind of external description, has not penetrated into the teaching process. Some researchers investigate the influence of small class sizes on students and find that the effect of small class sizes is more obvious in lower grades^[11]. In the evidence-based exploration with teachers as intermediary factors, it is generally concluded that small classes lead to more teacher-student interaction and the increase of one-on-one interaction has a substantial effect on teaching quality. Small class teachers are able to spend more on classroom management time shifted to teaching. All of these provide a favourable environment for the implementation of personalized teaching^[8].

3.3 Rational Return in the Opportunity of Educational Reform

The 1980s were American classes. The golden age of scale reform. Since then, with the failure of California's small class reform as the end, the American educational community began to reflect on the impact of small class reform on the quality of education. By analyzing the continuity of class size effect and reflecting on the research paradigm of experimentalism, the educational community gradually takes class size as the key means of educational reform.

Modern experimentalist paradigms, though, propel America. However, this research paradigm often neglects the internal heterogeneity between different classes, neglects the key differences between experimental conditions and teaching conditions. With the development of the study on the influence of small class size, scholars generally find that class size is not a direct influence on teaching quality, but only a catalyst for intensifying various factors in classroom. As for the influence of class size on teaching, the mechanism of influence of different class sizes on teaching is consistent, because the difference between students enrich the teaching space of individualized teaching. However, the small class reduces the pressure of classroom management, while the large class does not cause the increase of classroom problem behavior due to the decentralization of responsibilities^[12]. Following the disadvantages of randomized educational experiments, the failure of California's small class reform has directly aroused critical reflection on small class sizes. Some scholars conclude that there is a functional relationship between students' social background, teachers' workload and teaching methods in the process of class size effect. To this end, Elizabeth Graue and other scholars suggested that the class size reform should be used as an opportunity for educational reform, through small class teaching to enhance the understanding of the essence of teaching. On the one hand, it is necessary to track the successful practice of small class teaching and reconstruct the teaching strategy with its reasonable experience. On the other hand, we should pay more attention to the professional development of teachers and administrators^[13].

4. Enlightenment on the Research of Class Size in America

4.1 Focus on the complementarity between educational decision-making and educational research

In the history of American class-scale research, besides the promotion of modern experimentalist research paradigm, the government and front-line teachers' desire for a direct causal relationship between small class effect and teaching practice is also an important factor. This effect strengthens the scientific status of randomized experiment design and hides the disadvantage that evidence-based research neglects the social integrity and the functional relationship between various factors. As a result, some researchers investigated the teachers in STAR and found that the effect of class size on teachers was more reflected in the change of average workload per student than in the change of educational idea or teaching strategy^[14]. Therefore, in the process of improving the quality of education, we should not only consider the efficiency of the transition from research to decision-making, but also maintain the relative independence of educational research. Educational research should not only be conducted to understand

whether policies are effective under specific social conditions, but also to adjust the degree and form of randomization of experimental design in time according to their implementation ^[15].

4.2 Establishing Dynamic and Process-oriented Concept of Educational Quality

In the history of class size studies in the United States, early large class size studies used the value of limited educational resources as a measure of reform in order to address population pressures. Therefore, the evidence-based exploration in the small class research penetrates into the interactive factors in the teaching process. However, in the related studies, the educational scene in which the class-scale effect occurs is only a quasi-experimental scene after controlling the variables^[16]. It was only after the effect of small class reform was questioned and criticized that the American educational circles began to examine the class size from the perspective of opportunity. Therefore, quality should be regarded as a dynamic and historical category reflecting the educational process. American research finally takes class size as the opportunity for educational reform, and reasonably shows the openness of educational quality. So it turns out, the process of improving the quality of education is to stimulate the vitality of schools, discover the potentiality of education development and find its own development purpose.

4.3 Educational reform needs to take full account of the interests of all sectors of society

From early large-class studies to small-class experimental projects since the 1980s, class-size studies in the United States have focused on how to optimize the allocation of educational resources. In the period of large classification, because of the shortage of educational resources brought by the enrollment population, the benefits of reform investment have become a common concern in theory and practice. In the period of small class reform, how to withdraw the financial investment from teachers' treatment and pay more attention to the welfare of the lower class, small class reform becomes the choice. From the understanding of class size, the progress of class size reform in the United States must have its rationality, but this development is also the result of the common game of interests. To improve the efficiency of educational reform, it is not enough to focus only on the internal aspects of educational reform, but also to take fully into account the interests of all social sectors involved in education.

5. Conclusion

According to the historical evolution of class size studies in the United States, the clearer the relationship between class size and educational quality, the better the decision-making. Instead, better understand the impact of class size on the quality of education. The interaction of these two demands makes the mechanism of class size influencing the quality of education change. Through this historical evolution, we can see that educational decision-making and educational research complement each other. Only by establishing a dynamic and procedural view of education quality and fully considering the interests of all parties in society can we truly promote the rational development of education.

References

- [1] L. Whitney, G.S. Willey. *Advantages of Small Class [J]. School executives Magazine*, 1932:504-506.
- [2] Hanushek, E.A. *The Economics of Schooling: Production and Efficiency in Public Schools [J]. Journal of Economic Literature*, 1986(24):1167-1168.
- [3] Boyd-Zaharias, Jayne. *Project STAR: The Story of the Tennessee Class-Size Study [J]. American Educator*, 1999(23):2.
- [4] Trine Filges. Christoffer Scavenius Sonne-Schmidt. *Small Class Sizes for Improving Student Achievement in Primary and Secondary Schools: A Systematic Review [J]. Campbell Systematic Reviews*, 2018(14):13.
- [5] Jonah Rockoff. *Field Experiments in Class Size from the Early twentieth Century [J]. Journal of Economic Perspectives*, 2009:5-6.
- [6] Banks, Dawnette. *Impact of Class Size on the Distribution of Teacher Quality in Florida's Elementary Schools [D]. Florida State University*, 2017:3.
- [7] Oddny Judith Solhem. Vibeke Opheim. *Beyond class size reduction: Towards more flexible ways of implementing a reduced pupil-teacher ratio [J]. International Journal of Educational Research*, 2019(96): 147.
- [8] Biddle, Bruce J, et al. *Small Class Size and Its Effects [J]. Educational Leadership*, 2002, 14:21.
- [9] Moshe Justman. *Randomized controlled trials informing public policy: Lessons from project STAR and*

class size reduction[J]. *European ournal of Political Economy*,2017,1:6.

[10] Glass,G.V.,Smith,M.L.*Meta-analysis of Research on the Relationship of Class Size and Achievement* [J]. *Educational Evaluation nd Policy Analysis*,1979,12.

[11] Finn, Jeremy D. *Small Class in American Schools:Research,ractice,and Politics*[J]. *Phi Delta Kappan*,2002(3):559.

[12] Jeremy D. Finn,Gina M. Pannozzo,et al. *The“Why’s”of Class Size: Student Behavior in Small Classes* [J]. *Review of Educational Research*,2003(73):346.

[13] Elizabeth Graue. Erica Rauscher. *Researcher Perspectives on Class size Reduction* [J]. *Education Policy Analysis Archives*, 2009(17)17.

[14] Jessica Francis. William Steven Barnett. *Relating preschool class size to classroom quality and student achievement* [J]. *Early Childhood esearch Quarterly*,2019(49):54.

[15] Moshe Justman. *Randomized controlled trials informing public policy: Lessons from project STAR and class size reduction* [J]. *Europeanournal of Political Economy*, 2017(1):6.

[16] Micheal Gilraine, Hugh Macartney. Robert McMillan.*Education Reform in General Equilibrium:Evidence from California’s Class Size Reduction* [J]. *National Bureau of Economic Research*, 2018(02):3.