

## **New ways of thinking about research on class size: an international perspective**

### **Introduction to the Special Section**

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#### **Abstract**

Debate about class sizes in schools is long standing and contentious. In this review we show much research is limited and outdated, with an exclusive concern with pupil academic outcomes. This Special Section seeks to extend the literature on class size in two ways. First, it addresses what goes on in classrooms which might account for any effects found, and it also examines professional development approaches to making the most of teaching opportunities afforded by class size. Second, it reflects the shift of research on class size from the USA and the UK to elsewhere in Europe and in East Asia. This Section aims to provide a timely and significant advance on the rather tired debate over class size.

#### **Keywords**

Class size, classroom processes, professional development

### **1. Background**

Of all the issues in education, debate about the effects of class sizes in schools is one of the most long standing and contentious. A main reason for the debate is that smaller classes involve an increase in the number of teachers which in turn has important implications for educational planning and resourcing. Put simply, more teachers means more money, and it is understandable if there are hard questions asked about the value of this investment.

In 1998 there was a special edition of the International Journal of Educational Research (29) on the class size issue, edited by Maurice Galton. In this special edition there was a helpful and in many ways prescient review of the research on class size effects by Maurice Galton (Galton, 1998). Since then the often heated debate about whether class sizes matter has if anything become more strident and there is now a firmly entrenched gap between those in favour of class size reductions - often teachers and teacher unions, but also parents and some researchers - and those who argue that class size is not important - policy makers, as well as some researchers.

Many practitioners are of the view that small classes allow a better quality of teaching, more individual attention to pupils' individual characteristics, and a higher level of performance. There is a belief that large class sizes will constrain the kinds of teaching approaches that can be used, to the detriment of pupils' learning and teacher satisfaction. A UK survey of teachers conducted in 2009 by the Association of Teachers and Lecturers (ATL) found that almost all felt that there should be a maximum number of pupils in a class, a quarter believed that current pupil to teacher ratios were unacceptable, and the majority felt that large class sizes adversely affected pupil concentration and participation and teachers' stress levels. Some educationalists, such as Chuck Achilles in the USA (1999, 2000), have argued that small classes are so important that they should be the cornerstone of education policy. Parents are also worried

about large classes. The UK Times reported in 2014 that they were worried about their children being crammed into 'cattle classes' (Times 27/8/14) and referred to Government figures which showed that one in eight primary school children are taught in classes with more than 30 pupils. It has not gone unnoticed that many politicians in the UK (a large number of whom are no doubt sceptics on the policy need for smaller classes) often send their own children to private schools because, amongst other benefits, they have small classes!

But the dominant narrative now seems to be in support of the view that class size is unimportant. The OECD has been widely quoted for its conclusion that the supposed beneficial effects of Class Size Reduction (CSR) are a 'myth', and this conclusion is also found in a number of widely cited reports including those from OECD (OECD, 2012), McKinsey & Company (2007), Grattan Institute (2012), and the Brookings Institution (Whitehurst and Chingos, 2011).

These differences of opinion are significant at a time when demographic changes and budget cuts in a number of countries, including the UK, USA and Australia, mean there are intense pressures on class sizes. There is therefore a vital role for good research to help inform the debate over class size, but this volume starts from the view that much current debate and research about class size is limited and does not help inform educational policy on class size.

There are two general ways in which this volume seeks to update and extend the literature on class size. The first is that it starts from the premise that the usual exclusive focus on the connection between class size and pupil attainment is severely limited. One reason for this limitation is the narrow focus on pupil test scores in language and maths, as the way of assessing the effects of class size, while ignoring other cognitive and non-cognitive outcomes. Interestingly, this point was made in Maurice Galton's 1998 paper, though there has been little sign that researchers have heeded his point. Another limitation is the lack of attention to the classroom processes through which class size effects are mediated. Indeed, much of the recent literature rests on econometric or meta-analytical analyses of secondary data sets which, though often sophisticated in terms of the statistical modelling used, pays no attention to, and has no understanding of, what goes on in schools which might account for any effects found (or indeed any lack of effect). There is also a pressing need for more research on ways teachers can make the most of the opportunities afforded by smaller classes, and also how to make the most of larger class sizes. Once again, this requires an understanding of the pedagogical issues connected to class size, sadly lacking in recent comments and research.

A second important change since the 1998 IJER edition is that debate and research are now international in a way not seen in 1998. In the USA, despite the earlier and often described pioneering class size reduction studies like STAR, SAGE and other state wide Class Size Reduction (CSR) schemes, interest in CSR is now severely reduced. In the UK there has been no large scale research on class size since the CSPAR study in the 1990s. Recently, research has shifted to elsewhere in Europe with government funded initiatives now in place in France and Norway, both of which are represented in this Volume. There have also been important developments regarding class size in East Asia, particularly with regard to professional development in relation to class size reduction (see Blatchford, Chan, Galton, Lai & Lee, 2016). There has been interest in the West over why Asian regions like Shanghai and Hong Kong perform well academically, despite larger class sizes, and yet paradoxically in a number of these countries and regions, e.g., in Shanghai, Hong Kong, Taiwan and Macau, there have been government and state led initiatives to reduce the number of pupils and use professional development to facilitate what is called 'small class teaching' or 'small class education'.

This section therefore aims to provide a timely and significant advance – 20 years on from the 1998 Special Edition of IJER - on the rather tired debate over class size.

Leverhulme International Network.

This volume grew out of a Leverhulme funded international network 'Class Size and Effective Teaching' (2014 to 2017) which aimed to advance understanding of the educational effects of class size, and ways in which teachers can make the most of smaller (and larger) classes. It involved researchers ('Network Partners') from the UK, mainland Europe, East Asia and the USA who have contributed to what is known about class size. The researchers and this volume benefitted from two 3 day workshops in London and Hong Kong and a final two days of roundtable discussions in London involving an invited group of academics, Local Authority officials, representatives of educational organisations and practitioners. The papers in this special section are written by network partners.

## **2. Rationale and contents of this Section**

One overarching way of viewing the history of research on class size was provided by Blatchford (2012) who described it as involving 'three generations' of research. We use this framework in order to provide the background and rationale for each paper in this volume.

### **2.1. Class size and pupil learning outcomes**

We have argued above that the first generation of research on class size has primarily been about the effect of class size on pupil academic attainment. There are a number of good reviews of this work (Biddle and Berliner, 2002; Blatchford, 2012; Blatchford, Goldstein & Mortimore, 1998; Ehrenberg, Brewer, Gamoran & Willms, 2001; Grissmer, 1999; Hattie, 2005; Hattie, 2009; Wilson, 2006) and it is not intended to duplicate the coverage here. In general, the reviews draw out a difference of opinion, as above, between those who find a relatively small effect for class size and those who find a statistically and educationally significant effect. However, what is sometimes missed in the reviews of the research on class size is how few dedicated studies of class size we have, that is, studies which have been specifically designed to address the effect of class size, rather than studies which use secondary data from other sources. The STAR project (Finn and Achilles, 1999) remains the most convincing, dedicated study of the effect of class size (because it adopted a four year randomised controlled design) and found that pupils in small classes had higher school attainments than pupils in larger classes. This result was supported by a naturalistic non experimental study in the UK (Blatchford, 2003; Blatchford et al, 2002; Blatchford et al, 2003) which tracked pupils from 5-11 years and found positive academic results related to smaller class sizes in the first two years of schooling.

One of the limitations of much research on class size, as mentioned above, is the narrow focus on pupil academic attainment outcomes, usually measured in terms of test scores. The paper by Jeremy Finn in this volume is therefore very welcome because it provides a review of research evidence on a broader range of pupil learning outcomes and processes. The evidence base for this broader perspective is limited and so Jeremy Finn's collation of such evidence as exists is helpful. He covers non-academic effects on students, including enjoying school, better behaviour, engagement in learning and pro-social behaviour, and also classifies the extent to which there is certainty over the conclusions. Finn was one of the original Principal Investigators of the STAR project and the co-organiser of two important symposia on the policy and practice implications of class size (Wang and Finn, 2000; Finn and Wang, 2002) and so brings a wealth of experience to the topic.

The recent highly influential reports, cited above, in favour of a sceptical view about the importance of class size, draw their evidence from three main sources: PISA cross country comparisons of academic attainment (OECD, 2012); Hanushek's econometric analyses (Hanushek, 1999, 2001) and John Hattie's meta analysis (2009). Blatchford (2016) has argued that these sources do not provide the clear evidence one might expect for the strong claims made. In brief, in the case of cross country comparisons, we cannot conclude that a relationship between class size and academic performance (e.g., high performing Asian countries have large class sizes) means that one is causally related to the other; in the case of Hanushek's work on class size, there have been a number of strong technical critiques, e.g., by Ehrenberg et al (2001), Biddle and Berliner (2002), and Whitmore Schanzenbach (2016), which point out, amongst other problems, that the work is limited because it often does not study class size at all but ratios of pupils to teachers, which is a different thing; and in the case of meta analyses there are well rehearsed difficulties, particularly with regard to the problems in interpreting the inclusion of many different studies of varying degrees of quality. Another limitation of many studies reviewed, as mentioned above and as we describe below, is that they often lack attention to what goes on in classrooms, so have difficulties explaining any associations found.

Another feature of first generation research on class size is that it has been based primarily in the West, and in particular in the USA and the UK. Despite the increase in research in East Asia, as described above, there is little by way of first generation research studies, the study by Galton and Pell (2010) in Hong Kong being the exception. Whitmore Schanzenbach (2016) recently reviewed studies from Israel and Sweden, which have studied the effects of class size reductions brought about by enforced regulations (e.g., when student enrolment exceeds a certain tipping point, even by just one student, and schools have to then hire an extra teacher, thus at a stroke reducing class sizes by quite a large amount). These studies tend to produce positive effects for smaller classes.

We are therefore pleased to be able to include in this volume papers describing two new European studies.

The paper by Pascal Bressoux investigates the contemporaneous and carry-over effects of a class size reduction experiment in France. This experiment initially involved classes in which size was dramatically reduced and these were compared with full-size classes used as a control. The experiment was implemented in Grade 1, and the pupils were followed up over a two-year period until the end of Grade 2. Sophisticated multilevel growth curve modelling estimates were used to examine the effect of the class size reduction in Grade 1. Practical implications for a class-size reduction policy and limitations of the study are discussed in the paper.

Some have argued (Finn et al, 2003) that there is something unique about small classes, e.g., in terms of the sense of community and the quality of relationships that can be established. However, an alternative solution might be to increase the numbers of teachers so that extra teachers can be employed in ways likely to boost pupil performance and learning, e.g., by supporting certain pupils, sharing teaching activities and establishing pull out programmes for small groups of pupils or individuals. This might allow a more flexible way of making sure pupils get access to appropriate teaching support. In the UK there have been recent concerns about the deployment of Teaching Assistants as a solution to large classes, because research has found that pupils who receive extra support from TAs make less progress (Blatchford, Russell and Webster, 2012). The main problem here is that support from TAs can result in a lower quality of instructional talk and less support from teachers, and using extra trained teachers might be expected to result in a more positive educational input.

We are therefore very pleased to see that the Research Council of Norway (RCN) has instigated a large scale programme of increased teacher density and accompanying evaluations. The studies employ high standards of research design with randomised controlled trials to test the effect of extra teachers, as well as the effect of additional professional development. Given the importance of the class size debate and the lack of dedicated research, this kind of Government supported research is highly welcome and a lesson to the rest of the world. Oddny Judith Solheim and Vibeke Opheim, both from Norway, point out that the effect of reduced pupil teacher ratio has mainly been investigated by reduced class size, and that we have less knowledge about alternative methods of reducing pupil teacher ratios. They describe new research in Norway which is examining the deployment of more teachers in selected subjects as a more flexible way, both pedagogically and economically, to exploit the opportunities for adapted education inherent in reducing the number of students under a teacher's responsibility. They describe new Norwegian research designed to exploit a policy change towards increased teacher density in Norway.

## 2.2. Class size and classroom processes

Research on classroom processes affected by class size is what Blatchford has called the second generation of research (Blatchford, 2011). There have been some helpful reviews of the literature on classroom processes affected by class size (Biddle and Berliner, 2002; Blatchford 2012; Ehrenberg et al, 2001; Finn et al, 2003). These show that knowledge about mediating classroom processes is still relatively limited and this lack of clear research evidence is not helped by methodological weaknesses in much research in this area. Perhaps the most consistently identified classroom processes, affected by reduced class size, are individualization of teaching and individual attention (Blatchford et al, 2002; Blatchford et al, 2011; Ehrenberg et al, 2001; Finn et al, 2003), and pupil engagement in class (Finn & Achilles, 1999).

Existing studies of class size effects, including the STAR project, usually have very little systematic classroom process data through which to interpret results from linking class size and student achievement. We need studies therefore which examine changes that take place in teachers' and pupils' behaviour with changes in class size. For example, one reason for the relatively weak effect reported by some might be that teachers do not alter their styles of teaching when faced with fewer children. Conversely teachers faced with large classes might alter their styles of teaching and expend more resources and energy to compensate for having less individual attention. Given the strongly held view of many practitioners that large classes make teaching difficult and that small classes offer many opportunities for effective teaching, one might reasonably wonder why the effects of a small class size are not more obvious. Another way of viewing this issue is to say that better understanding of the classroom processes connected to class size differences should help address John Hattie's (2016) important question: why is the effect of class size so modest?

We have already said that much of the debate about class size has become a tired rehearsal of evidence for and against class size in relation to pupil academic outcomes; we believe that a reconnection with classroom processes and pedagogical considerations will help bring the debate closer to the reality in schools, and the important educational issues at stake. It may also help in understanding the gap between the views of practitioners on the one hand and the evidence from researchers, policy makers and others on the other hand when it comes to evidence on the effects of class size. The two groups may have in mind different things when thinking about class size effects. While some researchers and policy makers have in mind academic attainment outcomes usually in the main curriculum areas of literacy and

mathematics, practitioners may have a wider set of processes in mind when thinking about the benefits of class size reduction.

The special section has two papers on class size and classroom processes. As well as attention to non-cognitive pupil outcomes, Jeremy Finn provides a helpful review of classroom processes including effects on teachers (morale, time allocation, dealing with misbehaviour, and relationships with students) and underlying classroom dynamics (social, behavioural, instructional) that give rise to these. Recommendations are given for creating these underlying dynamics in larger sized classes.

Peter Blatchford and Anthony Russell draw from newly analysed data from the UK CSPAR study to examine previously unexplored connections between class size, within class groups and classroom management at KS2 (7-11 years). They argue that the overriding focus of most research on associations with pupil academic outcomes has often overlooked the way class size affects teachers' classroom management of learning, including the management of groupings within the class, a very common feature of classroom organisation in the UK. As part of the large scale multi-method CSPAR project, that tracked pupils' educational progress from 5 to 11 years, data on teachers' experiences as accessed through a large scale questionnaire and case study interviews were analysed. Results indicate that class size does not directly impact on attainment, but works through the many ongoing decisions teachers have to make about how best to manage and teach pupils in groups – decisions that become more difficult as classes get larger. The paper discusses a strategic approach to teaching groups and establishing collaborative learning in groups, which will benefit teachers in both small and large classes.

### 2.3. Class size and effective teaching

The first two generations of research on class size effects have, as we have seen, addressed relationships with academic outcomes and classroom processes respectively. The third generation of research on class size is concerned with pedagogical changes needed to make the most of class size reductions, and even make the most of larger classes. There is evidence that teachers do not always change their teaching in small classes (Shapson et al, 1980), and this therefore suggests that there is a need for teachers to carefully consider ways in which they should change their practice to make the most of having fewer pupils.

What often gets overlooked in debates about class size is that reducing the size of a class is not in itself an educational initiative like other interventions with which it is often (and in a sense unfairly) compared. The important issue is what other pedagogical changes one also needs to introduce to make the most of opportunities afforded by smaller classes. But the worrying problem is that we have next to no research on the impact of these changes along with class size reductions. We therefore rather urgently need studies which consider pedagogical changes along with CSR and CSR. As Maurice Galton pointed out in his 1998 paper, we also need an awareness that pedagogical changes may vary between countries, depending on different cultural views and practices relating to teaching. Going further, this strand of work also needs to consider professional development programmes designed to make the most of smaller classes.

These themes are addressed in the final two papers in this section which examine innovative approaches to professional development connected to class size changes. Developments in East Asia have been supported by government policies (Lai, Blatchford and Dong, 2016) and this has in turn been manifested by professional development initiatives – something unheard of in the West. In Hong Kong there was a realisation that class size reduction on its own was unlikely to be sufficient, and that the important thing was to work out effective

teaching approaches to make the most of the opportunities allowed by the recent class size reduction initiative.

This section has valuable chapters by two teams who have studied pioneering professional development schemes in Hong Kong, which have in turn inspired other schemes in East Asia more broadly. They offer valuable lessons for other countries.

Maurice Galton, KC Lai and Paul Chan show that in contrast to current Western perspectives, which as we have seen are sceptical about class size reductions both on economic grounds and because of the belief that other factors are more important in bringing about academic improvements, countries in East Asia have put in place various policies with the intention of reducing the number of pupils in primary classes. This difference in approach arises, in part, because the rationale for class size reductions in East Asia has not been the same as that governing the earlier efforts in the West. The authors first describe these differences and explore the consequence at various levels: policy, schools, and classes. They then explore the problems to emerge from these small class initiatives and evaluate attempted solutions. They describe a specific case study and draw out some of the key elements in the successful implementation process, and in the final part of the article look to the future and suggest possible ways in which present classroom practice needs to be modified to meet the new educational goals being set by policy makers across East Asia.

In the final paper in the section Gary Harfitt, Dennis Fung and Weijun (Tim) Liang from Hong Kong University argue that professional development (PD) to foster pedagogical change in the teaching of small classes is an under-researched area globally. They show that in Hong Kong a number of PD models have been implemented since small class teaching was officially introduced across the primary sector in 2009. Understanding of teacher learning experiences in relation to SCT remains limited, and the paper sets out to critically examine three separate government-sponsored PD courses for in-service primary teachers. They focus on the ways that in-service teachers experience professional learning and how they perceive the learning from the PD models as influencing their subsequent teaching. They identify overarching aspects of PD which are successful in helping teachers implement pedagogical change and innovation in SCT.

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