

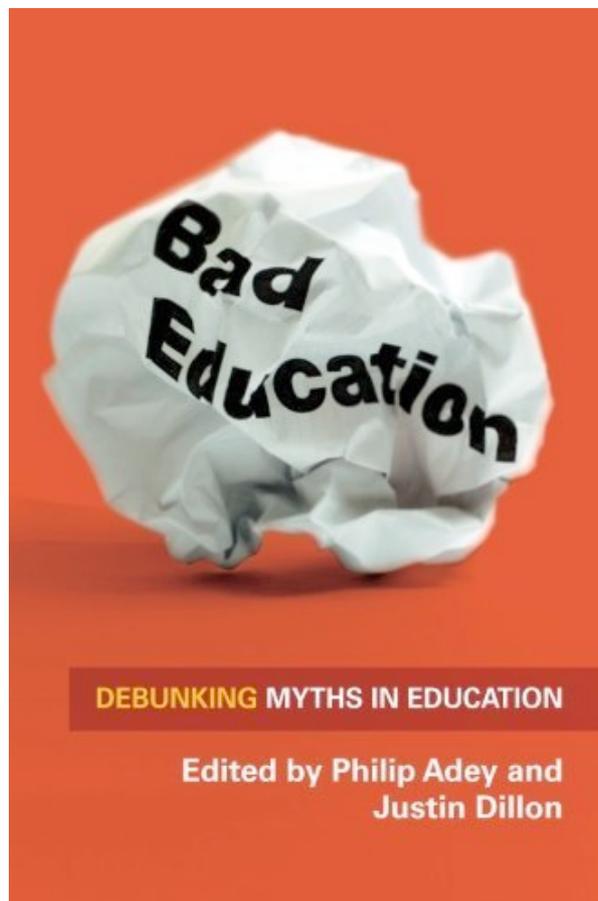
## **Class size: Is small better?**

**by Peter Blatchford (2012)**

Chapter taken from:

***Bad education: Debunking educational myths (2012)***

Edited by P. Adey and J. Dillon, published by Open University Press, UK



## CHAPTER

# 4

## **Class size: is small better?**

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The class size issue has been the subject of a huge amount of debate and coverage. The debate rears its head at regular intervals, and has been intense and at times aggressive. There are two opposed views. The first view seems the most in line with common sense. What could be more obvious: fewer pupils in a class is surely better for the pupils and for the teacher? One of the main reasons parents give for spending money on private education is that class sizes are smaller. The expectation is that small classes allow a better quality of teaching, more individual attention to pupils' individual characteristics, and a higher level of performance. Teachers are also often strongly of the view that small classes make their job easier. A 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. Christine Blower, the head of the National Union of Teachers (NUT) said in a BBC Radio 4 *Today* item on the class size topic in January 2012 that class size does matter because every extra pupil adds to the burden of a teacher.

This kind of view about the benefits of small classes has influenced policy-makers and politicians. Some educationalists, such as Chuck Achilles in the USA,<sup>1</sup> have argued that small classes are so important that they should be the cornerstone of education policy. In Hong Kong, as a result of mounting political pressure, the Government implemented

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a programme of class size reduction (CSR) in primary schools starting from 2009/10. There have been class size reduction programmes in other countries in East Asia (e.g. in mainland China, Singapore, South Korea and Japan), as well as in the USA, the Netherlands and Canada. In the UK, the Labour Government was sufficiently persuaded about the effect of class sizes that it introduced a cap of 30 in a class for children aged up to 7. The Scottish Government went even further and introduced a cap of 25 pupils in the class.

But there are powerful voices lined up against smaller classes. There is a good deal at stake for politicians and policy-makers because teachers usually represent the main element of education funding and even small reductions in class size can be extremely expensive. In the 1980s, in response to lobbying by teacher associations and local authorities to reduce class sizes, Conservative education ministers were keen to say that there was no proven link between class size and pupil achievement (though one suspects they still sent their own children to independent schools with smaller class sizes). Some politicians and policy-makers worry that teachers' arguments in favour of small classes are more about making life easier for them and strengthening teacher numbers than raising pupil performance. Some economists such as Eric Hanushek<sup>2</sup> have been widely quoted for his claim that reducing class sizes is not a cost-effective use of public funds and that money would be better spent in other forms of investment, in particular improving teaching quality.

The debate over class size is intensely political. As someone who has researched the topic extensively, I am often approached by policy-makers, politicians, teacher representatives, journalists and parents for my comments. Parents are often concerned about their children being in what they feel is too large a class, and want to get academic support that they can then use in lobbying the school and its governors. (I have also had a few queries from parents worried about their children being in a class that is too small and possibly too cliquy and dominated by the teacher.) Politicians, policy-makers, teacher unions and the media commonly look to research findings on class size effect for answers. What do they show?

In this chapter, I provide a review of evidence on the effects of class size. I seek to answer the question: are small classes better for pupils and teachers? We shall see that there have been two main types of

research: first, research on the effects of class size on pupils' academic performance and, second, research that investigates effects on classroom processes such as teaching and pupil attention. I draw out what I think are the main conclusions from this research. I also base my views on the extensive research experience of my colleagues and me at the Institute of Education in London. I argue that some of the popular views about the effects of class size are not born out by the research evidence, but that several general conclusions can be identified. I also argue that attention now needs to move to a new type of policy-related research, which I explain nearer the end of the chapter. Given word limits this chapter is inevitably selective and concentrates on pedagogical and educational implications of class size effects. It concentrates on school-based research at primary and secondary, and has little to say about further and higher education.

## What is class size?

In order to study class size effects it is first important that we obtain reliable measures of class size itself. Although this process may appear straightforward, in practice there are a number of complications. The terms 'class size', 'pupil/teacher ratios (PTRs)' and 'class size reduction (CSR)' have been used interchangeably. Class size might seem to be the most obvious and easily available measure, but the number of children actually in the class at any time may be different to the number according to the class register. PTRs are usually calculated by dividing the full-time equivalent pupils on a school's roll by the full-time equivalent number of qualified teachers, and are different to class size because they take no account, for example, of non-contact time. Given the huge increase in teaching assistants (TAs) in schools in the UK it might appear more realistic to calculate an adult/child ratio (where adults would include teaching and non-teaching staff) but this would assume that non-teaching staff were equivalent to teaching staff – an assumption that many educators and research (see below) would challenge. Although class size figures are probably more helpful as a guide to what pupils experience in schools, figures on PTRs are commonly given, and for some purposes class sizes are not available. International comparisons are often only available in terms of PTRs.

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These characteristics of class size and PTR measures are not trivial because the class size experienced by a pupil on a moment-by-moment basis is the unit most likely to be influential in affecting the learning and teaching in the classroom.

## **The effect of class size on educational outcomes**

The first, and most common, type of research has addressed whether smaller classes lead to better educational performance in pupils. There have been a number of key research projects and research reviews<sup>3</sup> and this section reports some of their key findings and conclusions. I also draw on a large-scale research project, carried out by the Institute of Education, which I describe below. There have been four main approaches that have been used: correlational, meta-analysis, experimental and longitudinal approaches. I briefly describe the main results from each approach.

### **Correlational/cross-sectional designs**

This is the most obvious approach. It examines associations between class size, on the one hand, and some measure of pupil academic performance on the other. This kind of approach was used by early studies in the UK, and it also characterizes studies from an economist's perspective. Interestingly, and counter-intuitively, these studies often found that pupils in larger classes outperformed pupils in small classes. However, this type of research is potentially misleading because we often do not know whether the relationship between the 'independent variable' (in this case class size) and the 'outcome' (pupil achievement) can be explained by another, confounding factor. To list three: the results could be explained by relatively poor attaining pupils tending to be in smaller classes; teachers being forced to change their style of teaching in larger classes; or experienced (and possibly better) teachers being assigned to larger classes.

Another way of approaching associations between class size and pupil performance is to compare the educational performances of countries with different class sizes. In recent international comparisons countries

with the largest class sizes – Japan and South Korea – have the highest levels of performance while countries with the smallest class sizes – for example, Italy – have the lowest levels of educational performance.<sup>4</sup> (Paradoxically, Asian countries with the highest performance have recently been pushing for small class sizes – partly fuelled by evidence from Western countries where results are far less impressive!) Though intriguing, global international comparisons of this sort are fraught with many methodological caveats (e.g. not controlling for other potentially influential factors in pupil achievement levels), and the, often counter-intuitive, results might be attributable to a host of cultural, educational and economic differences.

### Meta-analyses and other reviews

One of the main efforts to arrive at coherent evidence on the effects of class size on pupil outcomes has been through reviews of the research literature. There have several different types of reviews: general narrative,<sup>5</sup> meta-analyses,<sup>6</sup> and ‘best evidence’<sup>7</sup>. Glass et al.’s meta-analysis was influential at the time it was published in the 1970s. It involved taking the results from 77 studies and calculating overall effects using a common metric for each study. Results showed that effects on attainment increased as class size decreased, with the largest effects for classes smaller than 20. However, results are difficult to interpret because conclusions will inevitably depend on the quality of the studies included, and some of these are suspect as Bob Slavin’s review<sup>8</sup> points out.

Another frequently used method of evaluating the effects of class size and CSR is to compare them with other initiatives in terms of their effects on pupils’ attainments. A number of authors conclude that class reductions are less effective than other and less costly alternative reforms.<sup>9</sup> A recent review conducted for the Department for Education (DfE)<sup>10</sup> makes this one of its main conclusions about the effects of class size, and this is one of the main arguments of those who argue that small classes are not important. However, one needs to be careful with this kind of comparison. It is not a fair test in the sense that educational initiatives, with which CSR is often compared – such as one-to-one tutoring, peer tutoring and computer-assisted learning – are distinctive

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*methods* of teaching, while CSR merely sets limits on the numbers of pupils in a class involved. To be a fair test we would need to also take into account what teaching and instruction would be appropriate in classes of different sizes. I return to this point at the end of the chapter.

**Experimental studies**

The difficulty with simple correlational research, as we have seen, is that it cannot overcome the problem that an extraneous factor might explain the results. In other words, it could be something about the kinds of pupils (or teachers) in small or large classes, which might explain any differences found. Another way of expressing this point is to say that the allocation of pupils and teachers to classes of different sizes may be non-random, and, therefore, biased.

To overcome this important problem, it is often argued that experimental designs should be used in which pupils and teachers are randomly assigned to classes of different sizes. If this allocation is done properly, then any relationships between class size and later differences in pupils' academic performance in classes of a different size must be attributable to class size and not to any other factor. It should be no surprise that studies of this sort are so rare in educational research because they are fraught with ethical problems (imagine having to explain to parents that their child will this year be in a larger class than others) and financial problems (a few years ago, Peter Mortimore and I designed a possible UK experimental study but because smaller classes inevitably involve hiring more teachers and possibly creating more classrooms, it was prohibitively expensive). This is one reason for the high profile achieved by the STAR research in Tennessee. The principal investigators, who included Chuck Achilles and Jeremy Finn, and state politicians and teacher representatives, set up a study with a bold experimental design involving the random allocation of pupils and teachers to three types of classes in the same school: 'small' classes (13–17), 'regular' classes (22–25) and 'regular' with full-time teacher aide. The project involved over 7,000 pupils in 79 schools and students who were followed from kindergarten (aged 5) to third grade (aged 8). Pupils in small classes performed significantly better than pupils in regular classes and gains were still evident after Grade 4, when pupils returned to normal class sizes.

The STAR project was an important and timely study and results have provided the basis for a number of educational initiatives and policies in the USA and other countries. There have been criticisms; for example, student attrition from the study, the lack of pupil baseline data, and the possible effect of the allocation to experimental conditions on the validity of conclusions, but later reanalyses tend to support the main findings.

There have also been several other research projects in the USA (the main ones are SAGE, Primetime, California – see reviews in footnote 3). The strongest of these – SAGE – produced positive effects on pupil academic outcomes, but results are difficult to interpret because the study involved changes to pupil/teacher ratios rather than class size reductions, and this was only one of several educational interventions, so it is not clear what caused any effects on pupil outcomes. Overall, results from these studies are not conclusive.<sup>11</sup>

### Longitudinal correlational studies

Despite the common view that they provide the gold standard of evidence in the social sciences, experimental designs can have some often overlooked limitations (e.g. not covering the full range of class sizes, and unintended effects of assignment to small or larger classes on the attitudes and behaviour of participants). An alternative, and possibly more valid, approach is to examine relationships between class size and pupil academic outcomes, as they occur in the real world, and to make adjustments for potentially confounding factors such as pupils' prior attainment, level of poverty, teacher characteristics and so on. This was the approach adopted by a large-scale study in the UK (the Class Size and Pupil Adult Ratio (CSPAR) project), which I directed. This study used a longitudinal, naturalistic design and studied the effect of class size on pupils' academic attainment, and also classroom processes such as teaching and pupil attention.<sup>12</sup> We tracked over 10 000 pupils in over 300 schools from school entry (at 4/5 years) to the end of the primary school stage (11 years). There was a clear effect of class size on children's academic attainment over the first year of school (4/5 years), in both literacy and mathematics, even after adjusting for other possible confounding factors. The effect sizes were comparable to that reported by the STAR

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project. The relationship between class size and first (reception) year progress in literacy varied for pupils of differing baseline attainment (bottom 25 per cent, middle 50 per cent and top 25 per cent). As class size got smaller, there was a statistically significant increase in attainment for all three groups, though the effect was larger for pupils with lower baseline attainment. Effects were still evident on literacy progress at the end of the second year of school (Year 1), though by the end of the third year the effects were not clear. There were no clear longer-term effects of class size differences on mathematics achievement. Though this finding indicates that the early benefits ‘wash out’ after two years in school, there were no restrictions in terms of which size of class they moved to from year to year. In other results it was also found that moving to a class of a different size, especially a larger class, had a negative ‘disruption’ effect on students’ academic progress.

Although sophisticated, the CSPAR was still essentially correlational in design and so one cannot be exactly sure about causal direction. However, key potentially confounding variables were controlled for and one can be fairly confident that results reveal an *independent* effect of class size on pupil attainment – that is, that smaller classes lead to higher academic attainment – over and above other variables.

### **Some conclusions about class size effects on attainment**

As a way of summarizing research on the effects of class size on student academic outcomes, several general conclusions can be identified.

#### **Who benefits most?**

One of the clearest findings, as seen in both the experimental STAR project and the longitudinal CSPAR study (probably the best designed studies in this field), is that the effects of class size on academic outcomes are clearest with the youngest students. This finding offers support for policies involving CSR in the first years of school. There is little or no evidence that class size reduction by itself benefits students later in their school careers.

### Benefits for how long?

There is debate about the long-term benefits of CSR, which mirrors similar debates about the long-term effects of pre-school education. In the STAR project, effects lasted after the four-year intervention, once students had re-entered normal class sizes (i.e. after Grade 3). But some re-analyses of the STAR data suggest that the main effects were actually in the first year of the study and effects thereafter were minimal.<sup>13</sup> In the CSPAR study, as we have seen, effects were evident in the first and second years only, and this suggests effects 'wash out' after two years in school, though, as described above, children in this study (in contrast with the STAR project) were not restricted in terms of which size of class they moved to from year to year.

### Threshold effects?

One issue that often comes up when considering the effects of class size is whether there is an optimal number in a class in terms of pupil attainment. A common interpretation of the research evidence is that class size only has an impact when there are fewer than 20 pupils in a class. This view was repeated in January 2012 in the Radio 4 *Today* programme discussion referred to earlier. I do not think this view is justified by the research evidence. The selection of 20 as the threshold seems to have its origins in the Glass review, which we have seen is widely questioned, and in the STAR project where small classes, of around 17 pupils on average, were compared with a larger comparison group, of around 23 on average. Small wonder that 20 in the class comes out as a significant tipping point because this happens to be the midpoint between 17 and 23! Class sizes of 17 are uncommon in many countries, even in the USA, and an alternative approach, as has been seen, is to examine the effects of class size as they occur naturally across the full range of class sizes, rather than presuppose class sizes likely to be important. This was the approach adopted in the CSPAR study and we found the relationship between class size and pupil progress to be fairly linear, that is, across the full distribution of classes, pupil performance tended to increase as class size decreased. The conclusion seems clear: for the youngest children in school, the smaller the class the

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better, and there is not an optimal class size below which effects are more marked. I have not seen any good psychological reasons advanced for a tipping point below or above which class size effects change in intensity or character. It is also likely that effects will vary between different countries, educational systems and teaching approaches. In general I think it is probably oversimplistic to talk about optimal class sizes in an exact way.

### **Class size and extra adults**

These days, in many countries, there are many paraprofessionals in addition to teachers working in classrooms. In the UK, TAs now make up a quarter of the entire school workforce, and they spend much of their time in predominantly instructional activities with students.<sup>14</sup> We need therefore to consider the possible effects of adults other than the teacher in a classroom. Although positive findings have come from studies of the effectiveness of specific curriculum interventions given by TAs,<sup>15</sup> the largest study yet conducted on the effect of TA support on pupil academic outcomes found negative results; that is, those pupils with most support from TAs made less progress than similar pupils with less or no support, even controlling for the reasons why pupils were allocated more support in the first place (usually reflected in low initial attainment or classification of special educational need).<sup>16</sup> This conclusion is supported by findings from other research. It therefore seems that additional (non-teacher) staff in classes are not an adequate alternative to CSR. (See also Chapter 5.)

### **Measures of student 'outcomes'**

Most studies of the effect of class size have looked at pupil outcomes in the main curriculum areas of literacy and mathematics. This pattern is understandable given the importance of these areas in any consideration of academic progress, but it can provide a narrow picture of class size effects. Some have noted that small classes seem to promote more positive pupil attitudes, enthusiasm, confidence and ability to learn independently, rather than narrowly defined subject domain performance, but these kinds of pupil 'outcomes' have rarely been studied in research.

It seems to me that this lack of attention to non-academic outcomes might help explain the disparity between teachers' confidence in small class effects (which is based on a wide perception of pupil functioning) and more modest results from research (which has mostly focused on academic test results).

## Effects of class size in relation to classroom processes

Information on classroom processes affected by class size differences is important because without it there are difficulties in explaining effects on pupils' academic performance, and it is also difficult to offer practical guidance on how to maximize the opportunities provided by classes of different sizes. Knowledge about mediating processes might also help explain why previous research has not always found a link between class size differences and outcomes. It may be, for example, that when faced with a large class, teachers alter their style of teaching; for example, using more whole-class teaching and concentrating on a narrower range of basic topics. As a result, children's progress in these areas might not be different to children taught in smaller classes. Another possibility is that some teachers do not alter their teaching to take advantage of smaller classes and it is this reluctance that might explain why class size differences have little effect. 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.<sup>17</sup>

Once again, I draw on the main reviews of research evidence, as described above. The evidence suggests that there are two main classroom processes affected by class size differences: effects on teachers and effects on pupils.

The most consistently identified classroom process affected by reduced class size is individualization of teaching and individual attention. Glass and Smith concluded that smaller classes resulted in greater teacher knowledge of pupils and frequency of one-to-one contacts between teachers and pupils. Other studies also report more individual teaching and attention in smaller classes,<sup>18</sup> more feedback,<sup>19</sup> better relationships with and knowledge of pupils<sup>20</sup> and more differentiation.<sup>21</sup>

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Systematic observation techniques allow a direct and reliable method of measuring teacher attention to pupils.<sup>22</sup> In a Canadian study,<sup>23</sup> one of the few observation measures on which there were differences was the proportion of pupils addressed as individuals. This proportion increased in a linear way as class sizes decreased from 37, 30, 23 to 16. In the CSPAR, large-scale systematic observation studies conducted when pupils were aged 4/5<sup>24</sup> and 10/11<sup>25</sup> showed that at both ages, though there was a heavy reliance on whole class teaching and individual work, pupils in small classes were more likely to experience one-to-one teaching and were more often the focus of a teacher's attention. Elsewhere my colleagues and I have concluded that in smaller classes there was more likelihood of what we call 'Teacher support for learning', a main feature of which was individualized teaching in small classes.<sup>26</sup> In a further UK observation study, this finding was replicated, and, moreover, it was found to continue into secondary schools.<sup>27</sup> The connection between class size and individualization therefore seems a robust finding. There is also an indication from research, though less strong, that small classes have benefits in terms of easier classroom control and management, lower teacher stress and higher morale.

There is a good deal of evidence that pupil inattentiveness in class has negative effects on pupils' achievement<sup>28</sup> and studies of class size effects show that pupils in smaller classes attend more and spend more time on task, participate more, and are more absorbed in what they are doing. Finn and Achilles<sup>29</sup> (1999:103) argue that:

“ When class sizes are reduced, the pressure is increased for each student to participate in learning, and every student becomes more salient to the teacher. As a result, there is more instructional contact, and student learning behaviours are improved. ”

Jeremy Finn and his colleagues take this argument further and claim that student classroom engagement is the key process that explains why smaller classes lead to better attainment and conclude that class size affects student engagement more than teaching.<sup>30</sup> More recent research in the UK<sup>31</sup> allowed a more complete examination of class size and pupil attentiveness across both primary and secondary years. Interestingly, there was a statistical interaction between class size and pupil attainment

group (i.e. whether the pupil is from high, medium or low attainment groups) on pupil behaviour, in the sense that low-attaining pupils were far more likely to be off task in larger classes, and, conversely, more likely to benefit from smaller classes, in comparison to middle and high-attaining pupils. The research literature, therefore, suggests that class size affects individual attention and pupil engagement.

### Effective teaching in small classes

The two main types of research on class size effects have, as we have seen, addressed relationships with academic outcomes and classroom processes. If class size reduction is going to be used as an educational initiative then it is important to ensure that the education provided for students is as effective as possible. First, we need to look at what might constitute effective teaching in small classes.

One view is that no special forms of teaching are required. Chuck Achilles is adamant that teachers do not need special training to teach in small classes because the benefits for teaching are an automatic consequence of reducing class size. In a phrase, small classes allow teachers to teach better.<sup>32</sup>

However, consistent evidence that teachers do not always change their teaching in small classes leads me to the conclusion 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. In general, there are two different schools of thought about effective teaching in small classes. The first view bases its strategy on views on effective teaching more generally. Maurice Galton is clear that "[t]he "principles of effective teaching are the same in classes of all sizes"<sup>33</sup> (pp.6-7). In a similar vein, another experienced classroom researcher, Caroline Evertson, has argued that CSR programmes should heed research that supports calls for the teaching of problem-solving, independent learning strategies, learner-centred classrooms and higher-order thinking skills.<sup>34</sup>

The second view, however, is that specific guidance about changes to teaching practices in small classes is warranted. This position is supported by evidence, as we have seen, of consistent relationships between class size and classroom processes, and evidence of the way that teachers can be resistant to change when faced with small classes. Readers will

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find ideas on effective teaching in small classes in a number of places.<sup>35</sup> My colleagues and I have argued that it would be particularly valuable to concentrate on strategies for increased personalized, appropriate instruction, in line with the research literature, but to ensure also that we do not see all the benefits of smaller classes in terms of increased opportunities for individualized teaching rather than other pedagogical approaches.<sup>36</sup> Worryingly, for example, we have found *less* collaborative groupwork in smaller classes, probably because teachers feel they want to concentrate on maximizing their teaching with individual pupils. This practice is unfortunate because research evidence supports the use of collaborative groupwork as part of an everyday pedagogical approach<sup>37</sup> and it is likely to be most effectively introduced with fewer pupils in a class (though this suggestion requires more research).

### What kind of research is needed?

Despite the importance of creating an evidence base of effective teaching in small classes it has been possible to find next to no research that helps. This is a serious omission given the enormous policy and resource implications of class size. But what kind of research would be appropriate? Conclusions about the efficacy of CSR, as we have seen, are often made on the basis of comparisons with other interventions; for example, one-to-one tutoring, but this is not a fair test in the sense that CSR is not an intervention like tutoring but simply involves changing the number of people in a room, with no control over what happens in the room. We therefore need to evaluate the effect of CSR along with (though separable from) pedagogical changes that are expected to work well. To undertake this task, careful, controlled experiments would be valuable. Such studies should be based on random allocation if possible, though high-quality quasi-experimental designs would also be valuable.

### Conclusion

Perhaps the most interesting feature of the class size debate is the often wide gap between professional experience – which is usually that smaller classes will tend to result in more effective teaching and pupil learning – and research evidence which, as we have seen, has been less clear about the effects of class size differences. My feeling is that this disparity is

likely to have much to do with the fact that teachers have in mind a wide range of pupil attributes, covering academic achievement but also pupil attitudes to learning and behaviour, while research on the effects of class size has been mostly directed at test scores of pupil attainment in mathematics and literacy.

Nevertheless, in this chapter I have concluded on the basis of a careful review of the research evidence that class size does matter, but that it has to be seen in relation to pupils' age. The beneficial effects of smaller classes are most obvious with the youngest pupils in schools (up to about age 7 years). This conclusion is strongly suggested by perhaps the two best-designed projects, one experimental (STAR) and one naturalistic longitudinal (CSPAR). One conclusion, therefore, is that this is the age group for whom policy initiatives involving CSR should be directed. At the time of writing (January 2012) a council leader in London is seeking to encourage the raising of the legal maximum limit of 30 pupils at reception and Key Stage 1 in England. In the face of rising birth rates, and evidence from high performing Asian countries, there have also been favourable voices in the media for the setting up of very large class sizes. In my view these positions are opposed by the research evidence, and would be a retrograde step. We have also seen that extra adults in the class are not as effective as CSR and that there is little support for the idea of an optimal class size (e.g. 20 in a class).

Interestingly, research on relationships between class size and classroom processes has probably been clearer overall than that on academic outcomes. It indicates that effects are most likely on teacher individual attention towards students and student engagement in class. There is some support for the view that these effects tend to follow naturally from having fewer pupils in a class, that they extend across primary and secondary years (unlike effects on academic outcomes), and seem most marked in the case of lower-attaining pupils. Nevertheless, there is also evidence that teachers do not always change their style of teaching in small classes, and do not make the most of opportunities that small classes provide, which might explain the relatively modest effects on pupil performance found in some research.

The main point I want to end with is that the benefits of class size reduction, should they be introduced, are not likely to be maximized without attention to effective teaching in small classes. The commonly voiced argument that class size does not matter but teacher quality does

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is too simplistic. Posing the policy implications as being a choice between either investment in CSR or investment in teacher quality is, in my view, no more sensible than saying we should either invest in teacher training or school buildings: both are clearly important.

But just reducing class sizes and hoping for the best is not likely to be effective, and it is little surprise if some class size reduction efforts have led to little discernible impact on pupils. The main effort, now, should be in developing informed pedagogical changes in small classes. It is suggested that now is the time to invest in high-quality, adequately funded research that would systematically develop and evaluate the effectiveness of these pedagogical approaches along with CSR so that separate and combined effects can be judged. Work on this aspect has begun in earnest in East Asian countries but is lacking in Western countries. Given the enormous financial and staffing stakes involved in decisions about class size, it is vital that we move towards an evidence base that can help.

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