# Table of Contents

About the Author .......................................................... ix  

Introduction ................................................................. 1  

*chapter 1*  
**Why Educational Achievement Matters**  
The Increasing Importance of Educational Achievement .................. 5  
The Difficulties of Raising Student Achievement .......................... 8  
Three Generations of School Effectiveness Research ....................... 15  
The Impact of Teacher Quality ............................................ 17  
Ways to Increase Teacher Quality ......................................... 22  
Conclusion ..................................................................... 25  

*chapter 2*  
**The Case for Formative Assessment** .................................. 27  
The Importance of Professional Development ............................ 27  
The Origins of Formative Assessment ..................................... 35  
Definitions of Formative Assessment ...................................... 40  
Strategies of Formative Assessment ....................................... 51  
Assessment: The Bridge Between Teaching and Learning .............. 52  
Conclusion ..................................................................... 56  

*chapter 3*  
**Clarifying, Sharing and Understanding Learning Intentions and Success Criteria** ......................................................... 57  
The Importance of Learning Intentions ..................................... 57
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Eliciting Evidence of Learning</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>Finding Out What Students Know</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>Discovering Where Students’ Ideas Come From</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>Practical Techniques</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>Conclusion</td>
<td>122</td>
</tr>
<tr>
<td>5</td>
<td>Providing Feedback That Moves Learning Forward</td>
<td>123</td>
</tr>
<tr>
<td></td>
<td>The Quality of Feedback</td>
<td>123</td>
</tr>
<tr>
<td></td>
<td>Feedback as a Recipe for Future Action</td>
<td>139</td>
</tr>
<tr>
<td></td>
<td>Practical Techniques</td>
<td>142</td>
</tr>
<tr>
<td></td>
<td>Conclusion</td>
<td>152</td>
</tr>
<tr>
<td>6</td>
<td>Activating Learners as Instructional Resources for One Another</td>
<td>155</td>
</tr>
<tr>
<td></td>
<td>Effective Cooperative Learning</td>
<td>156</td>
</tr>
<tr>
<td></td>
<td>Practical Techniques</td>
<td>160</td>
</tr>
<tr>
<td></td>
<td>Conclusion</td>
<td>166</td>
</tr>
<tr>
<td>7</td>
<td>Activating Learners as Owners of Their Own Learning</td>
<td>169</td>
</tr>
<tr>
<td></td>
<td>Student Self-Assessment</td>
<td>170</td>
</tr>
<tr>
<td></td>
<td>Self-Testing</td>
<td>171</td>
</tr>
<tr>
<td></td>
<td>Self-Regulated Learning</td>
<td>174</td>
</tr>
<tr>
<td></td>
<td>Practical Techniques</td>
<td>180</td>
</tr>
<tr>
<td></td>
<td>Conclusion</td>
<td>185</td>
</tr>
</tbody>
</table>
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epilogue</td>
<td>187</td>
</tr>
<tr>
<td>Appendix: List of Techniques</td>
<td>191</td>
</tr>
<tr>
<td>References and Resources</td>
<td>195</td>
</tr>
<tr>
<td>Index</td>
<td>219</td>
</tr>
</tbody>
</table>
Why Educational Achievement Matters

Educational achievement matters more now than at any time in the past. It matters for individuals, and it matters for society. For individuals, higher levels of education mean higher earnings, better health and a longer life. For society, higher levels of education mean lower healthcare costs, lower criminal justice costs and increased economic growth. In this chapter, we will explore why education and educational achievement are vital to the prosperity of every nation, and why the vast majority of attempts by policymakers to improve the achievement of school students have failed. We will then discuss three generations of school effectiveness research, the impact of teacher quality and research-proven ways to increase teacher quality.

The Increasing Importance of Educational Achievement

Education has always been important, but it has never been as important as it is now. In 1979, the median salary of those with bachelor’s degrees was $30,000 higher than the median salary of those with a high school certificate or equivalent (in constant 2012 dollars). By 2012, the annual earnings gap had widened to over $58,000 (Autor, 2014).

Higher levels of education are also associated with better health; people with more education are less susceptible to a whole range of diseases, including cancer, and are less likely to have a significant period of disability toward the end of their lives (Jagger et al., 2007). No doubt this is partly due to lifestyle choices, such as smoking,
but it is also due in part to the kinds of work that are available to those with limited education. In an international survey conducted by the Organisation for Economic Co-operation and Development (OECD, 2010), approximately 61 per cent of adult respondents who did not complete high school reported that they are in good health, compared with 83 per cent of those with tertiary degrees.

Perhaps more surprisingly, people with more education live longer. Between 1915 and 1939, at least thirty US states changed their child labour laws and periods of compulsory schooling. As a result, a number of students were required to attend school for one more year than children in other states. By looking at the life spans of those who had been required to attend an extra year of school, Adriana Lleras-Muney (2005) estimates that each additional year of schooling adds 1.7 years to one’s life. These are high stakes indeed.

Educational achievement also matters for society. In another US study, Henry Levin and his colleagues at Columbia University estimate that preventing one secondary school dropout produces a net benefit to society of US $209 000 (Levin, Belfield, Muennig & Rouse, 2007). The main components of this total are:

- $139 000 in extra taxes the individual would pay because they would be earning more money
- $40 500 in reduced health care costs, partly because the individual would be healthier, as noted previously, but also partly because they would be more likely to get health benefits from an employer and, therefore, be less dependent on public assistance
- $26 600 in reduced criminal justice costs (largely because the individual would be less likely to be incarcerated)

With higher levels of education, national economies also grow faster. Using data from OECD’s Programme for International Student Assessment (PISA) and a variety of other sources, Eric Hanushek and Ludger Woessmann (2015) examine the impact of increased achievement on economic growth. They estimate that if educators could raise the scores of American 15-year-olds on the triennial PISA tests by twenty-five points – the improvement that Poland made over a period of ten years – then by 2095, the US economy would be 30 per cent larger than it would otherwise be. And if American 15-year-olds could achieve a level of reading and mathematics that allowed them to participate effectively in modern society (defined by a score of 420 on PISA as compared with the international average of 500), the US economy would grow by an extra $30 trillion (Hanushek & Woessmann, 2015).
The reason that higher levels of education are so valuable is because employers’ educational demands are increasing steadily, nowhere more so than in manufacturing. According to the US Bureau of Labor Statistics (2016), almost a million workers were employed in manufacturing. Ten years later, the figure was less than twelve million. This means that in the first decade of the 21st century, the US economy lost 2700 manufacturing jobs every day. It is common to hear people say, “We don’t make stuff in America anymore”, but the sentiment is wrong. It turns out that more goods were manufactured in the United States in 2016 than at any other point in its history, surpassing the previous peak reached in 2008 (Federal Reserve Bank of St. Louis, n.d.). The United States makes more stuff than it has ever made before. It just doesn’t use so many humans to do it – and that’s a good thing. Across all US manufacturing, between 2002 and 2015, manufacturing output per hour of labour went up by 47 per cent (Levinson, 2016). Compared to the heyday of American manufacturing, the average American worker employed in manufacturing in 2016 is more than six times as productive per hour as a worker in 1950. The reason that American workers are so much more productive is because they can work with more sophisticated technology, but this means that modern workers need higher levels of skill. Almost half of the manufacturing jobs that did not require a high school diploma in 2000 were gone by 2015, while the number of manufacturing jobs that required at least a master’s degree rose by 32 per cent (Levinson, 2016).

One common reaction to such changes in the working world is the fear that we are going to run out of jobs. Many people believe that there are only a certain number of jobs to go around, and if some of these jobs are destroyed, then there will not be enough work for everyone. This is an incorrect, albeit common, belief. Despite the millions of jobs that were lost in manufacturing, according to the Bureau of Labor Statistics, there are more people working in the United States than at any time in its history – 160 million as of May 2017 (US Bureau of Labor Statistics, 2017).

Interestingly, many of the new jobs being created do not demand much in the way of educational qualifications. In 2013, the US Bureau of Labor Statistics projected that between 2012 and 2022, the US economy will create just over four million new jobs for those with tertiary degrees, but it will also create three million that require some education beyond secondary school but not a university degree, four million that require only a secondary school certificate, and another four million jobs that do not even require a secondary school certificate (US Bureau of Labor Statistics, 2013). As far as can be seen, there will be jobs for people whatever their level of education in the United States. It is therefore probably not accurate to say to young people that they need to get a good education to get a job, but it does seem that education will be important to getting a good job.
We have already seen this in the changes that have occurred since the late 1990s. The greatest job destruction has not been for the lowest-skilled workers; rather, it has been for those doing routine jobs, whatever the skill level. And because computers are simpler and less expensive than robots, things like routine office work – what economists call routine cognitive jobs – have been easier to automate than manual work (Dvorkin, 2016). We think playing chess is an amazing human achievement, but for a few dollars, you can now buy a smartphone app that will beat most humans on the planet. What employers haven’t been able to do yet is to use robots to stack shelves in the supermarket in a cost-effective way, which is why humans do the job right now. But the message since the Industrial Revolution has been that as soon as a job can be done cost-effectively by a machine, it will be.

If having a valued skill no longer guarantees employment, then the only way to be sure of being employable is to be able to develop new skills, as Seymour Papert (1998) observes:

So the model that says learn while you’re at school, while you’re young, the skills that you will apply during your lifetime is no longer tenable. The skills that you can learn when you’re at school will not be applicable. They will be obsolete by the time you get into the workplace and need them, except for one skill. The one really competitive skill is the skill of being able to learn. It is the skill of being able not to give the right answer to questions about what you were taught in school, but to make the right response to situations that are outside the scope of what you were taught in school. We need to produce people who know how to act when they’re faced with situations for which they were not specifically prepared.

This is why education – as opposed to training – is so important. Not only does education confer skills, but it also produces the ability to develop new skills.

The fundamental idea that education is the engine of future economic prosperity has been understood for many years, but studies have shown just how much education increases economic growth (or, conversely, just how much economic growth is limited by low educational achievement).

The Difficulties of Raising Student Achievement

Successive governments have understood the importance of educational achievement and have sought to raise standards through a bewildering number of policy initiatives. Although most of these seemed like sensible measures at the time, the
depressing reality is that the net effect of the vast majority of these measures on student achievement has been close to, if not actually, zero.

A number of reform efforts have focused on the structures of schooling. In the United States, for example, particular attention was given to reducing school size. The logic was simple: many secondary schools are very large and impersonal, and so the creation of smaller schools should create more inclusive learning communities, which should then result in better learning. Advocates for smaller schools also pointed to evidence that in many states, the highest test scores were in small high schools. Unfortunately, they forgot to look at the other end of the distribution. The lowest test scores were also in small secondary schools (Wainer & Zwerling, 2006). The evidence suggests that small schools aren’t any better, on average. They are just more likely to have extreme results – whether high or low – because they are small (Kahneman, 2011). The fewer students there are in a class, the greater the chance that, in a particular year, the students happen to be either very strong or very weak academically. In fact, the evidence suggests that smaller secondary schools are actually less effective than larger ones because teachers have to teach a range of courses, and therefore have fewer opportunities to specialise. As one high school student in Seattle summarises, “There’s just one English teacher and one mathematics teacher. They end up teaching things they don’t really know” (Geballe, 2005).

The creation of smaller schools can also be rather inefficient. In many cases, large secondary schools are divided into smaller schools, each with five hundred or six hundred students, but housed in the same building. Often, in such cases that I have seen, the only change is increased administrative costs, as a result of appointing several new principals for each of the small schools and increasing the compensation of the existing principal for looking after the newly appointed junior principals.

In other cases, students have not experienced all the potential benefits of small secondary schools because leaders assumed the creation of small schools was an end in itself, rather than a change in structure that would make other needed reforms easier to achieve. One benefit leaders hoped for was that smaller schools would improve staff–student relationships, and with improved relationships, students would become more engaged in their learning. Students would interact with a smaller number of teachers, thus fostering the development of better staff–student relationships. This may well be effective, although it should be said that getting students engaged so that they can be taught something seems much less efficient than getting them engaged by teaching them something that engages them. But every student would still have an English teacher, a mathematics teacher, a science teacher, a history teacher and so on. The size of a secondary school does not affect the number of teachers a student
meets in a day. Staff–student relationships can grow stronger if teachers loop through with their students so that the same teacher teaches a class for more than a single year, but this requires amendments to schedules and depends on having teachers who can teach multiple year levels. Large secondary schools could easily incorporate this system, if they considered it a priority.

Other countries are going in the opposite direction. In England, for example, high-performing schools are asking their principals to assume responsibility for less successful schools by forming federations of schools – groups of schools with a single principal – but as yet, there is no evidence that this has led to improvement.

Other reforms have involved changes to the governance of schools. The most widespread such reform in the United States has been the introduction of independent "charter" schools. According to the Education Commission of the States (2017), forty-three states and the District of Columbia now have charter laws, but the evaluations of their impact on student achievement do not allow for any easy conclusions.

There is no doubt that some charter schools are achieving notable success, but others are not, and it appears that, at least to begin with, there were more of the latter than the former. In 2009, the Center for Research on Education Outcomes (CREDO) at Stanford University reported that across fifteen states and the District of Columbia, approximately one-half of charter schools obtain similar results to traditional public schools, one-third get worse results and one-sixth get better results (CREDO, 2009). For the first twenty years of their operation, the net effect of charter schools was to lower student achievement rather than increase it, although this may well have been partly because most charters get less money per student (Miron & Urschel, 2010). Some charter schools, such as those that the Knowledge Is Power Program (KIPP) operate, are undoubtedly much more effective than comparable traditional public schools. Students at KIPP schools typically make an extra three to four months more progress each year, but they achieve this by having longer school days, some Saturday classes and a longer school year (Tuttle et al., 2013). Each year KIPP school students spend 45 per cent more time in school and make about 30 per cent more progress – a clear example of diminishing returns. Moreover, while some charter schools are highly effective, most are not. An evaluation of the charter school system in Chicago (Hoxby & Rockoff, 2004) finds that students attending charter schools score higher on the Iowa Test of Basic Skills, but the effects are small: an increase of 4 percentile points for reading and just 2 percentile points for mathematics. As states have become better at closing less effective charter schools, the performance of charter schools has improved relative to traditional public schools, but a report from the CREDO team at Stanford – now covering twenty-two states and Washington, DC – finds that the differences are small (CREDO, 2013). In
Why Educational Achievement Matters

mathematics, performance was higher in 29 per cent of charter schools, about the
same in 40 per cent and lower in 31 per cent of schools. For reading, the figures were
56 per cent, 25 per cent and 19 per cent (CREDO, 2013). To put this in perspective,
on average, a student attending a charter school in the United States would make 4
per cent more progress (equivalent to eight days) than if they attended a traditional
public school – an improvement worth having, but much less improvement than we
need.

As the characteristics of successful charter schools become better understood, it
will, no doubt, be possible to ensure that charter schools are more successful, but it is
worth noting that the organisations that run the best charter schools are not keen to
expand quickly, so any impact on the whole education system will be slow. For exam-
ple, if we assume that the North American school population increases, as it has in
the past, at a rate of around 0.7 per cent per year, and the number of charter school
places increases by 250,000 each year (the average rate over the last few years), then
even if these new charter schools are as good as KIPP schools, it will be 2058 before
students achieve an extra three weeks’ learning per year (Wiliam, in press a). Of
course, we could expand charter schools more aggressively, but this would be likely
to result in lower quality, thus weakening the impact. Whatever their benefits, the
creation of charter schools is not likely to have a substantial and immediate impact
on student achievement (Carnoy, Jacobsen, Mishel & Rothstein, 2005).

In England, the government has reconstituted many low-performing schools as
“academies” that are run by philanthropic bodies but receive public funds equivalent
to public schools, in addition to a large capital grant for school rebuilding. The
principals of these academies have far greater freedom to hire and fire staff and are
not required to follow national agreements on teacher compensation and benefits,
nor to follow the national curriculum. Student test scores in these academies have
risen faster than those in regular public schools, but this is to be expected, since such
schools start from a lower baseline, and therefore have more room for improvement.
A comparison with similarly low-performing schools not reconstituted as academies
shows that they improve at the same rate (Machin & Wilson, 2009).

One of the most radical experiments in the organisation of schooling has been
taking place in Sweden. In 1992, the Swedish government invited for-profit provid-
ers to run public schools. Although many evaluations of this initiative found some
successes, each of these studies contained significant methodological weaknesses. An
evaluation from the Institute for the Study of Labor (Böhlmark & Lindahl, 2008),
which corrected the flaws of earlier studies, found that the introduction of for-profit
education providers did produce moderate improvements in short-term outcomes.