

What is the economic value of investments in education made by individuals, firms and governments? A new book edited by **Stephen Machin** and **Anna Vignoles** provides top quality empirical evidence on the diverse set of issues that this question raises – about school effectiveness, higher education funding, vocational study and much more.



What's the good of education?

Thousands of books have been written on the subject of education. Most try to suggest how we can have both more and better quality education. It is taken as read that this should be the goal of any sensible society. Yet is there really sufficient evidence to support the common held belief that we as individuals, and as a community, should be investing more in education?

To answer this crucially important question, we need to turn to an exciting and rapidly advancing field of research. The economics of education is about how education is produced, who gets more (or less) education and the economic impact of education on individuals, firms and society as a whole.

It is therefore concerned with a diverse range of issues and provides an analytical framework to think about such questions as: What is the best way to raise pupil achievement? What should we be paying our teachers? Why has society become more unequal? And how many graduates does our society really need?

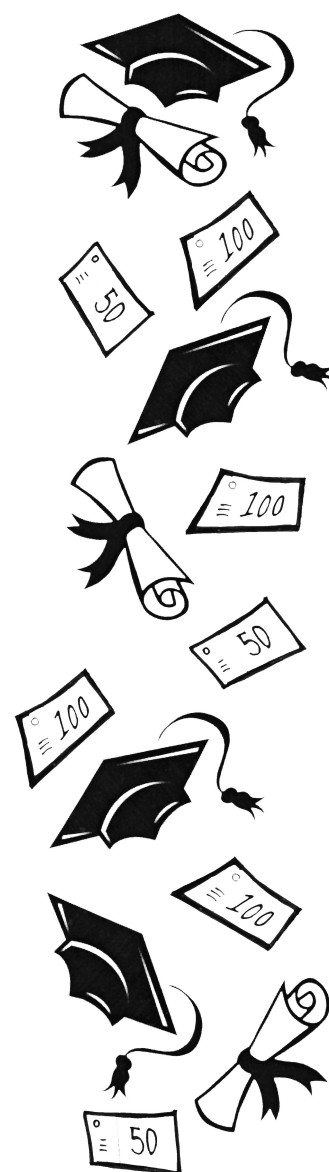
Human capital theory

The economics of education has a long and distinguished history. Adam Smith

alludes to the idea that people might invest in education to increase the productive capacity of society. But it is Gary Becker who is generally considered the founding father of the field, developing an analytical framework to explain why individuals invest in education and training in a manner analogous to investment in physical capital. The resulting human capital theory is still the basis of most research in the field today.

Human capital theory represented a distinct break from the past in that previously education was largely considered to be a consumption good. The wealthy were assumed to consume more non-compulsory education than the less well off, just as they consumed more of other goods. Education was also classified as a status good, consumed by the middle and upper classes to signal higher social standing.

Human capital theory suggests that in fact education should be seen primarily as an investment good. Individuals invest in human capital such as schooling because it makes them more productive and this is reflected in higher wages. Thus, it is argued that individuals primarily make investments in schooling and other forms of human capital to earn a return, that is, to increase their income in the future.



This essentially simple theory is a powerful tool for analysing a diverse range of phenomena. First, there are numerous forms of human capital, ranging from formal education through to on the job learning or firm-provided training. So human capital theory can be used to explain investments in schooling, the provision of training by firms, the acquisition of vocational qualifications, the benefits of informal on the job learning and so on.

But human capital theory also provides a framework for analysing policy interventions that result in investments in education. When the government invests in programmes such as a youth training scheme or a smaller class size initiative, we can analyse the likely impact of these programmes and their expected social and private rates of return using human capital theory. That is the focus of much of our book, exploring the latest research evidence on what raises performance at different stages of the education process – from compulsory education through higher education to the role education plays when children reach adulthood and enter the labour market.

Compulsory schooling

In the area of compulsory schooling, there are two key questions. The first is whether schools really matter for pupil attainment, a subject addressed in a now voluminous literature on school effectiveness. The answer is that schools do matter in that a significant proportion of the variance of pupil attainment can be accounted for by school and teacher effects. But even here, the story is not so simple. Parental influences are very important determinants of pupil attainment, although the best work in this area still finds a significant contribution from school attended over and above other factors.

Given that the school you attend matters, the second question is how can education policy be best designed to enhance student performance? The answer depends on a number of issues. First, as theoretical analysis of the delivery of public services makes clear, it is vital to understand the objectives of decision-makers in schools. Schools are not like private sector firms where the dominant view of economists is that the objective is to maximise profits and where there are clearly defined relationships between

Knowing what works in education is not sufficient to inform policy – we need to know at what cost relative to alternative policy options

interested groups. Rather, in the case of schools, there are multiple interest groups, often with conflicting objectives.

Of course, there are also multiple outputs from the education system, ranging from improving test scores to engendering a love of learning. So the critical issue for policy is to work out the best means by which competition, incentives and accountability can be brought together to enhance educational outcomes in the broadest sense.

This leads straight to the second point, namely that evidence (mainly from the United States – see Hoxby, 2003) shows that increased competition among schools and moves to decentralise school finance may enhance attainment, but can also raise inequality because richer parents are better able to take advantage. This has a productivity cost in that more able pupils from poor backgrounds fall behind.

This is particularly important in the UK context where there is a 'tail' of poor achievers. But despite moves to set up 'quasi-markets' in schooling, the government has also been introducing initiatives to raise attainment at the bottom end of the education distribution, and these seem to be working in the desired direction.

School resources

From a practical policy perspective, research on school resources and their potential impact on pupil attainment is an important area. Distinguishing between what works and what does not work is difficult, and the lines are somewhat hazy since it is hard to compare the efficacy of different policies. It is more feasible to

state what does seem to raise pupil attainment.

The literature on school resources is controversial, especially research on the effects of reductions in class sizes. The vast bulk of studies on class size find little (and sometimes counter-intuitive) effects of class size reductions on performance. But this can be misleading. The best, although rather context specific, studies, which adopt a more rigorous experimental approach to evaluating the impact of class size reductions, do find important effects on pupil attainment. Nonetheless, such reductions only offer a 'one-off change', the effects do not persist and the changes that do seem to affect attainment involve relatively large decreases in class size and are therefore costly. Moreover, some studies using similar methods do not reach the same conclusions.

Anecdotally, there are many statements that teachers, and the way that teaching is organised, matter for pupil attainment. While there is some UK evidence on this, the US evidence showing important links between year and grade-specific variations in test score gains and teacher characteristics does establish that some teachers achieve consistently better achievement scores from the children they teach than do others.

There are currently severe problems in attracting high ability, highly qualified students into teaching. One important policy angle seems to be to try and re-establish teaching as an important and well-respected profession. This requires policy-makers to think seriously about improving the total compensation package for teachers, including their pay relative to other professions, as well as non-pecuniary conditions of work.

As to the content of teaching, there is little quantitative evaluation in the UK setting. But Stephen Machin and Sandra McNally's (2004) work on the literacy hour shows that improving the way in which teaching is delivered – in this case through the well-structured literacy hour – can provide a cost effective means of raising pupil attainment.

Of course, knowing what works in education is not sufficient to inform policy. We need to know at what cost it works relative to alternative policy options. Yet there remains a deficiency of good cost-benefit evaluations in education. Perhaps the best example of a properly designed

evaluation in the UK is one of the Educational Maintenance Allowance (EMA) – a scheme that essentially involves ‘paying children to stay on at school’ – but even this does not include a full cost-benefit analysis (Dearden et al, 2005).

Simple comparisons of the magnitude of intervention effects (ignoring costs) are more common. For example, Eric Hanushek and Steven Rivkin (2003) conclude that greater school competition increases teacher quality or, more specifically, reduces the variance in teacher quality. They then attempt a direct comparison of this school competition effect with the class size effects arising from the now infamous Tennessee experiment. They suggest that a reduction in class size has an effect on pupil attainment that is in the order of one quarter to one fifth as large as a comparable increase in the impact of greater school competition and higher teacher quality.

While it is disputable whether these findings can be generalised, what is clear is the importance of at least being able to compare the magnitude of any intervention effects. Only when this is done to a much greater extent in the economics of education will researchers be able to give stronger advice to policy-makers as to where they should be spending the marginal dollar or pound of taxpayers’ money.

Post-compulsory education

The size of the post-compulsory sector of education has changed dramatically in many countries in recent years. So has the socio-economic mix of students. Contrary to what many expected before the expansion of higher education, the expansion has actually increased educational inequalities so that a greater share of participants are from well off backgrounds. As the article on UK social mobility on page 18 of this issue of *CentrePiece* indicates, this has had longer-term intergenerational consequences.

The fact that simply expanding the UK higher education system in the 1980s and 1990s did not narrow the socio-economic gap should be born in mind when considering future expansion of the system, especially in the light of government targets aimed at getting 50% of all young people to attend university by 2010.

Going beyond the issue of socio-economic inequality, there are two main

questions about the expansion of higher education. The first is whether more graduates are needed and whether, in the face of an increased supply of graduates, investment in post-secondary degree acquisition still yields a significant return. Here, there is strong evidence that the demand for graduates still outstrips the supply and there is still a significant payoff to having higher education qualifications.

Funding universities

In the face of continually rising student numbers, the second question is where do we find the resources to fund universities? The issue of charging student fees to attend UK universities is an important policy question since many people think students should pay (especially if they are to earn a future payoff), while others believe university should be a free good. On this issue, the empirical evidence is much weaker, partly because UK tuition fees were introduced in a way that has prevented evaluation of their impact on student participation.

From an economic perspective, the empirical evidence of persistent high private returns to a post-secondary degree would appear to provide justification for greater student contributions in the form of higher fees. But the critical point returns to the issue of the socio-economic mix of students. If fees are charged (the structure of which may in the future go more like the United States with

differential fees by subject and/or university), then it is absolutely vital that this does not act to reinforce inequality.

We know that the demand for education is generally quite inelastic: increasing the price will not depress demand substantially. But to the extent that demand from poorer students is more elastic, fees will provide yet another barrier preventing wider access to higher education. Providing financial support for able students from poor backgrounds has to be built in, even if it is costly. The 2003 proposals, which include exemption for poorer students and an income contingent loan system to cover fees, go some way towards this.

Research also indicates that socio-economic inequalities in education emerge well before entry to higher education. Therefore, policy focus needs to be directed towards reducing inequalities in the compulsory schooling phase.

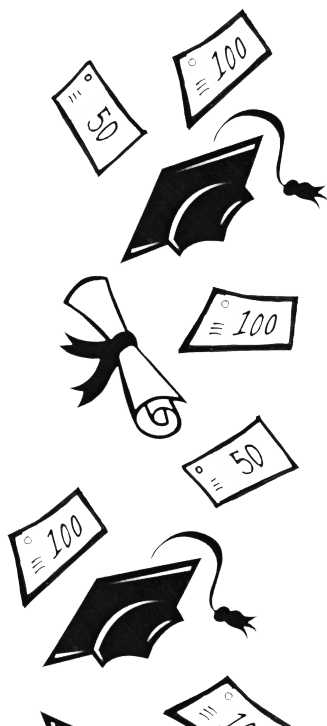
Vocational education

The other aspect of post-compulsory education that is highly policy relevant is the issue of academic versus vocational qualifications. The ‘problem’ of vocational education appears to be a recurring theme the world over. Many countries, like the UK, are concerned with the evident lack of parity between vocational and academic education, as measured by the lower economic returns to vocational qualifications.

This is to miss the point. A major reason that employers hold vocational qualifications in lower regard is because less able students choose to go down the vocational route. Education acts at least partially as a screening device, and there is UK evidence that opting to take the vocational route generally signals less cognitive ability.

But there are additional problems within the vocational education system itself, at least in the UK. The proliferation of vocational qualifications has led to a system little understood by employers. If employers are not even sure what a person has learned as a result of taking a particular vocational qualification, it is unsurprising that some qualifications have very little economic value. Continuing to develop new vocational qualifications in the fruitless struggle for parity with academic qualifications may actually exacerbate the problem (see McIntosh, 2004).

New education policies need to be drawn up in a way that allows robust quantitative evaluation



Education and the labour market

How well does the education system meet the needs of the labour market? What is evident is that employer demand for graduates is not letting up. Despite rapid increases in the supply of graduates, facilitated by the expansion of higher education, wage differentials between graduates and non-graduates have not fallen over time. This implies that the demand for skills continues to rise. The other side of this is that, in rapidly evolving modern workplaces, there are fewer places for those without educational qualifications.

This is one of the key policy issues of our time. It is compounded in some countries (notably the UK and the United States) where the education and skill distribution has a significant proportion (as many as one in five) of adults with basic skills problems. Add to this the fact that lifelong learning has very little directly measurable labour market value in the UK and it would appear that 'getting it right' in the compulsory schooling phase is critically important.

We also know that less able UK students who go down the vocational route at age 16 often end up with qualifications that do not benefit them in the labour market. While improving the content and marketability of these qualifications is one strategy, the underlying message for policy-makers is that as many as possible of our 16 year olds should have attained good basic skills and the cognitive ability to pursue a high value qualification. If we continue to let students leave the education system with very poor basic skills, these individuals will be disadvantaged for life. Going back and trying to repair the damage in mid-career is unlikely to help them.

Evaluating education policies

So how do we assess the economics of education field in terms of its usefulness for policy-making? While by no means perfect, the evaluation of the EMA scheme provides a standard in terms of robust and policy applicable analysis. There are two reasons why it was so effective. The first is that in this particular policy area, economists already had the necessary tools with which to undertake the analysis. The more important reason, however, is that policy-makers specifically

designed the EMA intervention in such a way as to make it amenable to rigorous quantitative evaluation. For example, it was not rolled out nationally and a serious attempt was made to obtain proper control groups.

This would seem to be the future of effective policy-making in education. Policies need to be drawn up in such a way that robust quantitative evaluation is possible, with much emphasis on the need to construct a proper control and to document fully the inputs and outputs associated with the policy intervention.

In the right circumstances, randomisation can be an attractive, and conceptually appealing, possibility here and one that the government should be more open to pursue. But we would not go as far as some, who argue that random experiments need to be conducted to test any new educational policy. There are instances where random experiments are neither feasible nor ethical, and where non-experimental analysis of observational data can be extremely useful.

Nonetheless, if we wish to see a step improvement in the quality of education policy-making, much more attention must be directed towards the design of such policies and their potential to be accurately and precisely evaluated. Those working in the field of economics of education have, of course, an important role to play in this process.

If we continue to let people leave the education system with very poor basic skills, they will be disadvantaged for life

What's the Good of Education? The Economics of Education in the UK edited by Stephen Machin and Anna Vignoles is published by Princeton University Press (2005). **Stephen Machin** is Professor of Economics at University College London, research director of CEP and director of the Centre for the Economics of Education, which is funded by the Department for Education and Skills. **Anna Vignoles** is Senior Lecturer at the Institute of Education and a CEP research associate.

Further reading

Gary Becker (1964), *Human Capital: A Theoretical Analysis with Special Reference to Education*, Columbia University Press.

Lorraine Dearden, Carl Emmerson, Christine Frayne and Costas Meghir (2005), 'Education Subsidies and School Dropout Rates', forthcoming Centre for the Economics of Education Discussion Paper.

Eric Hanushek and Steven Rivkin (2003), 'Does Public School Competition Improve Teacher Quality?', in Hoxby (ed.).

Caroline Hoxby (2003), *The Economics of School Choice*, University of Chicago Press.

Stephen Machin and Sandra McNally (2004), 'The Literacy Hour', Centre for the Economics of Education Discussion Paper No. 43 (<http://cee.lse.ac.uk/cee%20dps/ceedp43.pdf>).

Steven McIntosh (2004), 'Further Analysis of the Returns to Academic and Vocational Qualifications', Centre for the Economics of Education Discussion Paper No. 35 (<http://cee.lse.ac.uk/cee%20dps/ceedp35.pdf>).

