
Introduction

Economics involves the study of choices that, in a perfect world, are made with the benefit of full information. When information is incomplete, choice gets messy, and that makes the study of how decisions are made particularly interesting. Education, of course, is all about situations where information is incomplete. According to the theory of human capital, before receiving education people (hopefully!) know less than they know afterwards – through education they gain in cognitive and non-cognitive skills, and they learn also about the qualitative nature of the education in which they have invested. This process of learning has been the subject of much research by economists over recent years. The educational production function once served as a useful ‘black box’, allowing insights to be gained about the impact of education and hence providing important input to policy. But more recent work has focused on opening up the black box, to provide greater understanding of exactly what works, and what does not, in education, by means of analyses of single educational processes, interventions, activities. This volume, which is designed to complement the earlier Edward Elgar volume edited by Johnes and Johnes (2004),¹ gathers together much of this new evidence.

The view of schooling as an investment in human capital has dominated the economic analysis of education for more than half a century. Inevitably, it is here that the book begins. Geraint Johnes, Jill Johnes and Laura López-Torres review recent work on human capital and the analysis of rates of return to education in Chapter 1, particularly focusing on a number of issues, including overeducation, returns to early years schooling, heterogeneity of returns and endogeneity issues. One area in which significant gains in understanding have been made over recent years concerns the returns to different types of skill that can be encouraged through education. So Fernando Saltiel, Miguel Sarzosa and Sergio Urzúa, in Chapter 2, examine the variety of attributes that can be promoted by education. Cognitive and non-cognitive skills can be learned in different measures at different stages of life, and different types of skill also subsequently have different impacts on labour market performance. Efficient investment in education therefore requires a clear understanding of how (and at what age) things should be taught.

While education is a sound investment for many young people, offering a rate of return that is high in comparison with other investments, many nonetheless drop out of the education system at an early age. In Chapter 3, Sofie Josefina Cabus examines comparative data on school dropout across a wide variety of countries, and reviews the literature on the determinants of dropout. Some of the factors that act towards increasing the phenomenon could be mitigated by policy. For example, smoothing the transition of students as they move from one level of education to another, and providing smart reporting on truancy can both help reduce the incidence of dropout. Some other factors – in particular neighbourhood characteristics – are more impervious to policy, but are nonetheless

¹ Johnes, G. and J. Johnes (eds) (2004). *International Handbook on the Economics of Education*, Cheltenham: Edward Elgar.

important and reflect broader concerns of social inequities. These are explored further in the next two chapters, by Abigail McKnight and by Kristof De Witte and Florian Tomini. Access to education varies by background and, through the impact that schooling has on subsequent labour market experience, can perpetuate inequalities across the generations. Policies that can serve to interrupt this deleterious chain of events include investments in early childhood education and extra-curricular activities. Tracking or selective schooling tends to exacerbate the problem. Thus, these chapters shed light on the relationship between the policies towards efficiency and the equity problem, that is still a key topic for the improvement of education overall.

In Chapter 6, Steven McIntosh develops the analysis of rates of return to education to consider changes over time in the rewards attached to different levels of schooling. A rapidly growing literature has pointed to increased polarisation in the labour market, with growing demand for highly educated (and highly skilled) workers and also for those at the bottom end of the skills distribution, but with a declining demand for those with intermediate skills. These developments are likely due to technological change and innovation that has a differential impact on workers with different skill sets. They have a potentially profound impact on the role that is to be played by education in the future.

While there is a long tradition of studies that evaluate the economic returns to education, many of these treat the educational production function essentially as a black box. In Chapter 7, Carla Haelermans and Joris Ghysels provide a richer understanding of how investments result in student learning, focusing on the evaluation of interventions that influence the pedagogic process within classrooms. These include the use of information technology – either the availability of computing equipment or of specific software – books, learning materials or tuition in learning strategies. While the results of these studies are mixed, they illustrate the potential of statistical analyses using an educational production function to provide a greatly enhanced understanding of how students learn. Innovations in pedagogy are examined further by Stéphan Vincent-Lancrin in Chapter 8.

In Chapter 9, Tommaso Agasisti and Alex J. Bowers consider the increased role played by data analytics in education. They show how the tools of data science can be used to enhance performance when applied to the big data sets that can be assembled on student performance (and aggregated to teacher, subject or school level). Daniel Santín and Gabriela Sicilia (Chapter 10) develop further a suite of measurement methods that can be used in this context in the following chapter. In Chapter 11, Jack Britton and Anna Vignoles formally introduce the idea of the educational production function, and show how outcomes vary with inputs including family inputs, school resources and teacher quality.

A key feature of studies that employ educational production functions concerns consideration of the scale of operation. Education is, to a certain extent, a club good; students are taught in classes rather than on a one-on-one basis. The fixed costs associated with running a class, and indeed with running a school, can be spread over many students, yielding scale economies. Yet in other respects, small schools offer advantages. In a Tiebout model, for instance, a multiplicity of heterogeneous small schools might allow students to choose the style of provision that best suits them, thus yielding pedagogical advantages, that will be reflected in higher levels of efficiency. The evidence on this is considered by Patrice Iatarola and Leanna Stiefel in Chapter 12. The related question of school choice more generally is taken up by Ilja Cornelisz in Chapter 13, where the impact of alternative mechanisms for sorting students across schools is considered. A large

variety of school choice schemes operate in practice, and these can have a subtle impact on efficiency and, in particular, equity.

A significant literature has emerged in recent years about the impact that management methods can have on company performance, and it is natural to seek to extend the insights from such studies into the educational sphere. This is the subject of Chapter 14, by Adriana Di Liberto. The findings suggest that management indeed matters. The implications of this for policy are less clear, however. Giving schools autonomy should help raise performance where good managerial practices are employed, but could have a deleterious effect elsewhere.

Chapter 15, by Henry M. Levin and Clive R. Belfield, concerns the application of methods to assess the cost-effectiveness of specific educational interventions. By developing tools that allow comparison of interventions on a level playing field, the authors show pronounced differences in costs at which alternative policy mechanisms achieve their stated goals.

The remainder of the book comprises a number of chapters that consider topics specific to higher education. The funding of university education has been subjected to radical reform in a number of countries over the last quarter of a century. In Chapter 16, Nicholas Barr draws some general lessons from international experience and, working from a series of principles to which any funding mechanism should adhere, proposes solutions that can apply to different HE settings.

In Chapter 17, Fengliang Li discusses the rise of open educational resources, focusing specifically on the development of Massive Open Online Courses (MOOCs). There has been substantial growth in provision of this kind in recent years, with many higher education institutions contributing courses to providers such as Coursera, edX and FutureLearn. The funding model for these courses remains unclear. Li offers as a possible rationale for the provision of these courses the idea that they may help institutions realise economies of scope. The rise of MOOCs serves also to highlight the fact that not all education takes place in the formal sector. In Chapter 18, Junyan Liu and Mark Bray provide evidence on the scale of private tutoring in a variety of countries, and assess its effectiveness. The evidence on this is, at best, mixed, suggesting that much remains to be learned about what forms of informal education promise the highest learning gains.

Finally, while education is obviously a transforming experience for those being educated, the fact should not be overlooked that the education sector employs large numbers of workers – typically well over 5 per cent of the total labour force. In Chapter 19, Ray Bachan and Barry Reilly consider the labour market for educators, focusing on one small subgroup – university vice chancellors/rectors – and they find evidence that pay is related to some mix of financial performance and the degree to which the institution progresses in pursuit of its mission.

As the chapters of this volume demonstrate, current research on the economics of education is vibrant. The evidence base on what works in education has expanded tremendously over recent years, as economists have started to open up the black box of the educational production function. As the cross-fertilisation of ideas across disciplines continues, we confidently expect further important gains in our understanding. Yet the environment of which educational systems form a part is changing rapidly too, and the nature of the demands that society makes on education is evolving. Most obviously, this is likely to require education and training genuinely to become lifelong activities. The

research effort will need to be redoubled in order to keep, or ideally to gain, pace on the changing world.

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