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Educational Objectives in Advanced Countries: Some Economic Considerations

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One of the two main influences on education planning today, Carl Bereiter remarks at the beginning of his paper on 'Liberal Education in a Knowledge Society' (Chapter 2 in this volume), is a set of economic views on what should be the educational objectives of advanced countries at the beginning of the twenty-first century. Bereiter's paper combines these economic concerns with recent work in cognitive science, in order to make recommendations for education planning.

This is a laudable objective, and one generally neglected by members of both disciplines. Economists tend to focus on whether economic agents are more (or less) educated, but to ignore the technologies by which educated economic agents are produced. And, as history suggests, for centuries educators (and more recently cognitive scientists) have tended largely to ignore the economic relevance of what schools taught and how they taught it. Bringing together economists' assessments of the objectives of education with cognitive scientists' findings about how to achieve these objectives is therefore an important task.

What should be the economic objectives of education in advanced countries? This might seem to be a straightforward question with quite simple answers. Certainly, the 'futuristic business

literature' which Bereiter identifies as a major influence on current education planning proffers extremely simple answers to this question. In our view, however, the answer is not that simple. The main aim of this paper is to examine what current thinking in economics actually suggests about what should be the economic objectives of education in advanced countries today. We conclude that economic research implies rather different priorities for education than those suggested by the futuristic business literature. This in turn, we suggest, presents different challenges to cognitive science and education planning.

We begin by looking at education as a way of making people better producers, since this is the approach to educational objectives adopted both by the futuristic business literature and by most economists until recently. If improving people's production skills is the priority, what does the economic evidence suggest should be our main educational objectives? What implications does this have for the 'liberal education' tradition?

We then go on to ask whether it is right to define economic objectives for education solely in terms of making people better producers. Economic agents are consumers as well as producers, and recent work in economics suggests that education may play an equally or more important role as a way of improving people's skills as consumers—consumers of both material goods and political and cultural ideas.

Finally, we briefly addresses Bereiter's argument that the best way to achieve both content mastery and knowledge skills is to enculturate children into 'World 3'—the world of ideas. World 3, we argue, is a big place and resources for education are limited. As economists, we ask whether some regions of World 3 are more productive areas to enculturate children into than others.

I. Production Skills: What Does Economics Suggest Should Be the Educational Objectives of Advanced Countries Today?

Let us begin by examining education as a way for people to invest in improving their skills as producers. From this perspective, what should be the economic objectives of education in advanced countries today? It might appear that persuasive answers to this ques-

tion have already been advanced in the 'futuristic business literature'. Both education planners in the United States and politicians during recent election campaigns in Britain have clearly been influenced by such answers. As summarized by Bereiter in his paper, and as reflected in publications such as Thomas A. Stewart's book, *Intellectual Capital* (Stewart 1997), the futuristic business literature advances the following general argument. In the last 30 years, they say, the nature of economic activity in advanced countries has changed fundamentally.¹ Whereas economies used to be oriented around producing physical output—agricultural commodities in agrarian societies, manufactured goods in industrial societies—now they are organized around producing knowledge.² This has given rise to a so-called 'knowledge society', which presents new and unprecedented challenges to education provision.³ The sources of these unprecedented challenges are "the rapid rate of technological change, the rise of Asia Pacific economies, digitization, globalization, outsourcing, the shift from a manufacturing-based to a knowledge-based economy, and the need for constant

1. On the timing of this transformation into "a new, knowledge-based economy," as having taken place over the past three decades, see for instance Stewart 1997, p. 3.

2. Carl Bereiter, in 'Liberal Education in a Knowledge Society', summarizes this literature by referring to the importance of "taking seriously the idea of a knowledge society, a society organized around the production of knowledge in the same sense than an agrarian society is organized around agricultural production and an industrial society is organized around manufacture" (p. 12). Stewart (1997), p. 3, writes about how "knowledge has become the most important component of business activity." An early expositor of this point of view appears to have been Pope John Paul II (widely known for his profound views on economics), who wrote in his 1991 encyclical *Centesimus Annus* that "Whereas at one time the decisive factor of production was the land, and later capital . . . today the decisive factor is increasingly man himself, that is, his knowledge" (quoted in Stewart 1997, p. 12).

3. Bereiter, 'Liberal Education in a Knowledge Society', p. 13: "the ascendant importance of knowledge: knowledge as a third factor in production, along with capital and labor; learning as the means for organizations to gain a competitive edge; . . . the idea of a social transformation going on that is as extreme as the nineteenth-century shift from an agrarian to an industrial society—the shift to a knowledge society." Stewart (1997), p. 5, acknowledges that "knowledge has always been important," but continues that "knowledge is more important than ever before . . . because we are in the midst of an economic revolution that is creating the Information Age."

innovation.”⁴ Consequently, these challenges are not merely a temporary problem, but are permanent trends which are going to intensify over the foreseeable future.⁵ To respond to these challenges, the argument goes, workers in the ‘knowledge society’ have to possess new skills: “imagination and creativity, ability to work in groups, communication skills, information-finding skills, problem-solving abilities, technological literacy, and above all a continual readiness to learn.”⁶ Yet, the futuristic business literature implies, workers are not currently getting the optimal quantity and quality of these skills from the education system. According to the futuristic business thinkers, this is a problem not just for a small minority of unemployable people, but for every single future worker and manager. That is, education systems in advanced countries are failing almost all their ‘customers’, and must be revolutionized in order adequately to serve the revolutionized nature of economic activity in the ‘knowledge society’.

This story sounds so plausible that it has entered the working vocabulary of businessmen, politicians, planners, journalists, and ordinary people. It has almost become part of common sense. But viewed from the point of view of economics, the ‘futuristic business literature’ is, to put it bluntly, all but worthless: it amounts to little more than a collection of slogans, with next to nothing by way of theoretical or empirical basis. This may sound deeply disappointing. What the economic objectives of education should be

4. Bereiter, ‘Liberal Education in a Knowledge Society’, p. 13. Stewart refers to “large, unruly forces: globalization, which has opened enormous new markets and, a necessary corollary, enormous numbers of new competitors; the spread of information technology . . . ; the dismantling of the many-tiered corporate hierarchy . . . a new Information Age economy” (1997, p. 6); later he summarizes these transformations as being four in number: “globalization, computerization, economic disintermediation, and intangibilization” (p. 7).

5. Stewart 1997, p. 6, argues that these changes are a revolution in the strict dictionary sense of the word: ‘a sudden, radical, or complete change . . . a basic reorientation’. In his view (p. 6), ‘the changes surrounding us are not mere trends but the workings of large, unruly forces’, i.e. they are not going to be reversed. Later (p. 10), Stewart refers to the ‘Information Revolution’s reinvention of business, economic life, and society’ and claims that ‘this new event will transfigure and disfigure all it touches’.

6. Bereiter, ‘Liberal Education in a Knowledge Society’, p. 13. Stewart writes that “success in a knowledge-based economy depends on new skills and new kinds of organizations and management” (1997, p. 17).

is an important question. It can’t simply be ignored. This paper argues that it doesn’t have to be ignored. Educators should indeed pay attention to economic objectives, but these objectives need to be identified more carefully, analyzed more logically, and supported with much firmer empirical findings. In this paper, we survey developments over the past generation in the labor-market experiences of more educated and less educated people in advanced countries. These findings, we suggest, imply rather different challenges for cognitive scientists and education planners in rich western economies at the beginning of the twenty-first century.

Before we begin, we need to be clear about some basic features of the following analysis, which are characteristic of economists’ approaches to discussing education. The first is that economists tend to focus on the role of education in economic success, as measured, for example, by the higher wages received by more educated workers. This is not to deny that education yields other benefits to individuals, by, say, enhancing the quality of their lives, or to society, by producing better citizens; indeed, we will direct our attention to such questions in the next section of our paper. These other benefits, however, are typically not the subject of economic analyses of education.

The second characteristic feature is that economic analyses of education do not consider the details of the educational process—that is, they stay out of the realms of cognitive science and educational psychology, the field of expertise of many of the contributors to this volume. For economists, better-educated individuals are individuals who have completed more years of formal education: typically, economists have nothing to say about whether a given number of years of formal education results in better-educated individuals if these years are organized in one way rather than another.

With these preliminaries out of the way, let us turn next to the meaning of a ‘knowledge society’. We are frankly rather sceptical about this term as it is defined in the futuristic business literature. As far as we can determine, this literature has conflated at least four different sets of arguments into the single, vague, catch-all slogan of a ‘knowledge society’. Definition 1 claims that a ‘knowledge society’ is, in Bereiter’s summary, “a society organized around

the production of knowledge in the same sense that an agrarian society is organized around agricultural production and an industrial society is organized around manufacture."⁷ Definition 2 claims that advanced countries are 'knowledge societies' in that technological change is much more important for economic growth than ever before.⁸ Definition 3 argues that advanced countries are 'knowledge societies' in the sense that economic success is now determined by the ability of individuals and firms to accumulate and transform information in such a way as to produce and market goods efficiently and flexibly, something which has never before been the case.⁹ Definition 4 is that advanced countries are 'knowledge societies' in the sense that without the ability to understand and transform knowledge (in other words, without high levels of education) it is hard for individuals to find decent jobs in such societies.¹⁰

Not only does the slogan 'knowledge society' conflate four very distinct sets of arguments, but for several of these arguments there is very little hard economic evidence. Advanced countries today are not knowledge societies in the sense of Definition 2, that technological change plays a greater role than ever before. The pace of technological change has certainly been rapid in the recent past, but it is not clear that it has been faster recently than in the more distant past, nor that its contribution to economic growth has been relatively more important recently.¹¹

Nor are present-day advanced countries knowledge societies in the sense of Definition 3, that economic success is for the first time in history dependent on the ability of firms to process information effectively. In 1995, Nick von Tunzelmann carried out a thorough

7. Bereiter, 'Liberal Education in a Knowledge Society', p. 12.

8. Stewart 1997, pp. 6-7, 12-14, 21-22, 76, 79-106.

9. Stewart 1997, p. ix: "Information and knowledge are the thermonuclear competitive weapons of our time. Knowledge is more valuable and more powerful than natural resources, big factories, or fat bankrolls. In industry after industry, success comes to the companies that have the best information or wield it most effectively . . ."

10. Stewart 1997: "We are all knowledge workers now, working for knowledge companies" (p. xiv); "the skills individuals and companies need to succeed in their new environment, the knowledge economy are, in many cases, different from the ones they are used to" (p. xii).

11. See Collins and Bosworth 1996, Table 7 and pp. 185-86.

survey of what economic historians now know about the process of industrialization over the past 250 years in Britain, continental Europe, the United States, the U.S.S.R., Japan, and the NICs (Von Tunzelmann 1995). According to von Tunzelmann, a major factor contributing to successful industrialization in all these countries since 1750 has been "the knowledge base accumulated over time by the producing unit, i.e. the firm."¹² That is, successful economies have been 'knowledge societies' for a very long time. At least since the first industrial revolution, which began in Britain around 1750, and possibly already during the English and Dutch agricultural revolutions of the sixteenth and seventeenth centuries, the production and efficient use of knowledge has been an essential component of economic success. In this sense, every successful economy in history has been a knowledge society, and economic history provides no empirical basis for arguing that the economic contribution of knowledge today is higher than it has been in other rapidly growing economies over the past several centuries.

It is also difficult to marshal any economic evidence to sustain Definition 1, according to which a 'knowledge society' is "a society organized around the production of knowledge" (in Bereiter's summary) or (in Thomas Stewart's formulation) one in which "knowledge and information . . . have become the economy's . . . most important products."¹³ A more convincing characterization of the advanced economies at present is that they are organized around the production of services—in the U.S.A., for example, more than 70 percent of workers are currently employed in services.¹⁴ This observation seems to us to lead to a more useful interpretation of

12. Von Tunzelmann 1995, p. 4. Von Tunzelmann draws a distinction between 'information' (the sum total of messages generated in the world, which is in principle marketable) and 'knowledge' (which is not marketable because it is embodied in the highly various learning processes of individuals and firms). The fact that knowledge is not marketable, von Tunzelmann argues, is why firms exist: they have advantages over both individuals and markets in accessing, accumulating, combining and transforming knowledge from diverse sources for particular production purposes (p. 5).

13. Bereiter, 'Liberal Education in a Knowledge Society', p. 12; Stewart 1997, p. x.

14. In 1992, services accounted for 72.5 percent of total employment in the U.S.A., and 62 percent in the (then) European Community countries (OECD 1994, Table 1.1).

the sense in which advanced economies as a whole constitute a 'knowledge society', once it is recognized that service sector jobs are increasingly likely to be in highly-skilled areas, such as teaching, financial services or information technology, rather than in unskilled areas.¹⁵

This in turn provides some support for the only sense of 'knowledge society' for which there is much hard economic evidence at all. This is Definition 4, according to which a 'knowledge society' is one in which workers and managers who have higher levels of education are likely to enjoy higher economic returns. Even this definition of a 'knowledge society' should be subjected to closer empirical scrutiny, however, since many of the statements made about it in the futuristic business literature are not justified by the facts, and consequently the educational objectives derived from it are also largely unjustified.

Let us begin this closer empirical scrutiny by examining developments in labor markets in the advanced economies over the past 15 or 20 years. In particular, let us focus on the extent to which there has been growing inequality between skilled, well-educated workers and unskilled, less-educated ones.¹⁶ Since the late 1970s, unskilled, less-educated workers in advanced economies have experienced a significant worsening of their position in the labor market compared to that of skilled, well-educated workers. Perhaps the best-known aspect of this growing inequality concerns earnings. In the U.S.A., the ratio of the average earnings of males aged 25–64 with less than full secondary education to the average earnings of males in the same age group with university degrees fell by 21 percent over the period 1979–92. In the U.K. the corresponding change (for males aged 25–59 over the period 1979–91) was a 17 percent fall.¹⁷ In the U.S.A. these changes have meant a significant fall in real earnings for less-educated workers over the period, while in the U.K. the changes have involved only a very slight fall in real earnings.

15. In both the U.S.A. and the E.C., finance and business services was the area of services employment which experienced the fastest rate of growth over 1979–92 (OECD, Table 1.3).

16. In what follows we will not be maintaining any distinction between 'skilled' and 'educated', but rather using these terms synonymously.

17. Glyn 1995, Table 7.

The growing inequality in the earnings of less- and well-educated workers is not, however, observed in other advanced economies to anything like the same extent as in the U.K. and the U.S.A. In many other countries, particularly continental European ones, there has not been any increase in the inequality of earnings between less- and well-educated workers since the late 1970s. What has happened has been an increase in the inequality of employment between these groups. Relative to well-educated workers, less well-educated workers in Germany, Italy, and Belgium have experienced a greater increase in the incidence of unemployment if they are actively participating in the labor market, and also a greater increase in withdrawal from the labor market.¹⁸ It should be noted, however, that the increased inequality in earnings between less- and well-educated workers in the U.S.A. and the U.K. has not prevented less-educated workers in these countries from experiencing as much increase in inequality of employment as their counterparts in continental Europe. Less-educated workers in the U.K. and the U.S.A. have experienced a markedly larger deterioration of their labor-market position than less-educated workers in other advanced countries.

This deterioration of the relative labor-market position of the less-educated has taken place in the context of their diminishing numerical importance in the labor force throughout advanced economies.¹⁹ It cannot, therefore, be explained as a result of an increased supply of less-educated labor—that is, counter to the claims of the futuristic business literature, education systems in advanced economies do not appear to be systematically failing to educate a majority of their students to the changing demands of the economy. Instead, the observed increase in the share of well-educated workers in the employed labor force together with an improvement in their relative labor market position appears to be

18. Glyn 1995, Table 7.

19. The proportion of the labor force with degrees increased throughout OECD countries in the 1980s, often by about 50 percent (OECD 1994). In the U.K., 6 percent of the employed labor force in 1979 had a degree or higher qualification, 44 percent had an intermediate qualification, and 50 percent had no qualifications. The corresponding figures for 1991 were 8 percent, 55 percent and 37 percent respectively (Machin 1996, Table 8).

the result of a shift in the demand for labor away from less-educated workers to well-educated ones, to which a significant proportion of people have responded by securing more education for themselves.²⁰

Two main reasons have been adduced for this shift in demand toward more educated workers: increased international trade, and technical change biased in favour of high-skilled labor. These two reasons are often lumped together, with significantly more stress being laid on international trade—the specter of ‘globalization’ so frequently invoked not just by the futuristic business literature but by politicians and conspiracy theorists of a variety of persuasions. But these two causes of the shift in labor demand toward more educated workers—globalization and technical change—are conceptually distinct. Retaining this distinction is very important: these two factors have had quantitatively very different effects on labor demand; they have differing probabilities of continuing into the foreseeable future; and they have quite distinct policy implications.

The international trade argument—economic ‘globalization’—is the one on which most emphasis is customarily placed. In its simplest version, it argues that less-developed economies, with relatively low wages, are increasingly able to export labor-intensive goods to advanced economies. This competition from low-wage economies makes production of these goods in advanced economies unprofitable, since producing such goods uses a substantial amount of unskilled, but relatively high-wage, labor. The result is some combination of falling relative wages and rising relative unemployment for unskilled workers in the advanced economies. The skill-biased technical change argument is rather different. It simply states that, for unexplained reasons, technical change over the recent past has systematically been biased against unskilled workers and in favour of high-skilled workers. The two arguments are not, of course, mutually exclusive—both factors may

20. For instance, 15 years ago only 2 out of 3 American adults were high-school graduates, compared to 4 out of 5 today. In 1980, 20 percent of American men had spent at least 4 years in college; by 1994 it had risen to 25 percent. Among American women, 13 percent had spent at least 4 years in college in 1980, compared to 20 percent by 1994. The same pattern can be seen in other advanced economies: in 1993 German university enrollment surpassed enrollment in the vocational apprenticeship system for the first time. See Stewart 1997, p. 47.

have been significant. For education planning, it is important to establish how significant each of these factors has been.

The relative importance of increased trade and skill-biased technical change in explaining the shift in the demand for labor away from unskilled towards skilled workers is ultimately an empirical matter. The available evidence suggests that skill-biased technical change has been the more important factor. The World Bank points out that in 1992 imports of manufactures from developing economies were only about 2 percent of advanced economies’ GDP.²¹ Even though these imports were labor-intensive, the direct effect on employment in advanced economies must have been small. Factor content calculations suggest that trade with developing economies since the mid-1970s has reduced the demand for unskilled workers in advanced economies by 2 to 5 percent of the unskilled labor force (1 to 3 percent of total employment). This evidence implies that the effects of trade have not been large enough to account for the observed fall in the demand for unskilled labor.

In addition, there is also evidence specifically supporting the view that the main reason for the shift in labor demand toward more educated workers has been skill-biased technical change (Machin 1996). If trade were the major reason for the fall in unskilled labor demand, then most of the fall in the employment share of unskilled workers should be accounted for by falls in employment in those industries which are subject to competition in the form of imports from low-wage economies. To the extent that the relative wages of unskilled labor decline as a result of international trade, unskilled labor should then be replacing skilled labor within industries which are not subject to competition from low-wage economies. However, the evidence shows that the majority of the decrease in the proportion of unskilled labor is not due to decreases in particular unskilled-labor-intensive industries, but has occurred within all industries. This is inconsistent with the trade explanation. Furthermore, the increases in the proportion of skilled workers which have occurred in all industries are positively correlated with indicators of technical change: the fastest increases in the use of skilled workers during the 1980s have occurred in industries which are more technologically advanced.

21. World Bank 1995, p. 56.

Skill-biased technical change, therefore, appears to be the major reason for the worsening of the labor market position of less-educated workers in advanced economies, although trade considerations have played some part. Increased competition from low-wage economies may also have been one reason for the bias in technical change against unskilled labor. Despite these qualifications, the available evidence is not consistent with the view that 'globalization', in so far as this means increased trade with low-wage economies, is the major factor underlying the deterioration in the relative labor market position of the less-educated in advanced economies.

What interpretation can be given to the meaning of a 'knowledge society' in the light of this review of labor-market developments in advanced economies? As we have argued above, most of the features glued together into the unwieldy conglomerate term 'knowledge society' are nothing like as new and unprecedented as is often claimed. However, advanced economies have become more extreme examples of 'knowledge societies' in so far as the labor-market returns to being well-educated have increased significantly in recent decades. Individuals with little education are now in a relatively worse labor-market position than they were thirty years ago, especially in the U.K. and the U.S.A.

However, these developments in the recent past are simply accentuations of factors that were already present, factors that can be observed in poor countries as well as advanced ones. Indeed, in some ways, education has a greater impact on people's well-being in poor economies than in advanced economies, since in poor economies education levels are significant predictors not just of wage rates, but of farm productivity, child mortality, family morbidity (illness levels), fertility rates, female nutritional status, and many other non-pecuniary measures of economic well-being.²² In poor and rich economies alike, on average, individuals with higher levels of education have better labor-market opportunities than do

22. From the vast literature on the effects of education in less-developed economies, see especially: World Bank 1984, pp. 69-70, 76-77, 82-84; Birdsall 1988, pp. 514-16; Behrman and Wolfe 1984; Kanbargi and Kulkarni 1986; Kanbargi and Kulkarni 1991, pp. 125-163; Schultz 1988, pp. 585-614; Behrman and Deolalikar 1988, pp. 660-674; Psacharopoulos 1984; Jamison and Lau 1982.

individuals with lower levels of education, and this has been true for a long time. The changes in the labor-market position of the less- and the well-educated that have occurred in advanced economies since the late 1970s have very starkly emphasized that more educated people have better opportunities than less educated ones. Our own view is that advanced economies have been 'knowledge societies' for some considerable time, in that the better-educated members of these societies have consistently had better labor-market opportunities.

What implications does this interpretation of a 'knowledge society' have for educational objectives in advanced countries? In order to answer this question, let us begin by noting that the education system can contribute little to alleviating the problems currently being experienced by less-educated workers in advanced economies, except by the provision of specific training to enhance their skills, which may be one policy option. A second point to note is that there is no obvious reason to assume that the deterioration in the labor-market position of the less-educated over the past 15-20 years will continue. Since this deterioration is primarily the result of skill-biased technical change, and since the reasons for this bias in the direction of technical change are not understood, it is quite possible that the relative labor market position of the less-educated will improve in the future if the nature of technical change alters. However, competition from low-wage economies is likely to continue in the future, and this will have some effect in reinforcing the decline in labor-market opportunities for the less-educated, although its effects should not be overstated.

The main educational objective for advanced countries should, in our view, be to improve the attainments of children at the bottom of the distribution of educational achievement. Justification for this objective can be given either specifically in terms of recent developments in advanced-country labor markets, or more generally in terms of the desire for greater equality in labor market outcomes for individuals. There are some reasons to think that this objective is particularly pressing for the U.K. and the U.S.A. As we have seen, the less-educated in these countries have experienced an especially severe worsening of their labor-market opportunities in recent years. Furthermore, the U.K. and U.S.A. appear to be the two advanced countries with the greatest dispersion of educational

attainments. A larger proportion of young people in these countries participate in higher education than in most other advanced countries, while at the same time there are greater deficiencies in basic skills such as literacy and numeracy in the U.K. and U.S.A. than in most other advanced countries.²³ The performance of U.K. and U.S.A. children in internationally co-ordinated mathematics tests also shows a wider distribution of performance than in most other advanced countries, as the table below indicates.

TABLE 3.1

Scores of 13-year-olds in International Mathematics Tests, 1990

	England	France	Italy	Switzerland	U.S.A.
Average	59.5	64.2	64.0	70.8	55.3
Highest decile	89.3	89.3	88.0	93.3	82.7
Lowest decile	32.0	37.3	36.5	50.7	29.3

Source: Prais 1993, Table 3

When considering what can be done to achieve this educational objective, it is important to ask why individuals have not already responded to the incentives for improved educational attainments. In fact, a large proportion of individuals *have* responded to these incentives, as is shown by the much larger proportion of adults finishing school or attending college in America and other advanced economies today than was the case even 15 years ago (Stewart 1997, p. 47). However, it is clear that a disturbingly large minority of individuals are *not* responding to the incentives created by the fact that more education leads to higher paychecks, and it is important for economists to ask why.

23. The U.K. Department for Education and Employment *Skills Audit* (1996) assessed the educational achievements of the U.K., the U.S.A., France, Germany, and Singapore. In terms of the percentage of the population with a first degree, the U.S.A. ranked first and the U.K. second out of the five countries. However, in terms of the literacy of adults (an assessment based on the opinions of multinational companies) the U.K. ranked only fifth, while in terms of the numeracy of adults (also based on multinationals' opinions), the U.S.A. and the U.K. ranked equal fourth.

It could be argued that the amount of education an individual should acquire can be determined by a simple weighing of benefits against costs. The benefits are calculated by the individual in terms of the returns he or she gets from more education, in the form of higher earnings or a greater likelihood of being able to get a job. The costs are calculated in terms of the effort and disutility (boredom, frustration) required to obtain particular qualifications, and earnings foregone while continuing to acquire education. From this point of view, the fact that some individuals choose to acquire only a minimum level of education could be interpreted as the result of a calculation on the part of these individuals that the costs to them of acquiring more education exceeded the benefits. If this argument were correct, the case for trying to improve the educational attainments of the less-educated would be weak.

There are various reasons why the argument just given is not correct. First, the decision to acquire better education involves incurring significant current costs in the expectation of future returns. It is not easy for individuals to borrow against higher future earnings in order to finance the education that might get them these future earnings, so individuals with low family incomes, or limited assets, may not be able to afford the level of education they would wish to acquire. This problem should not be over-emphasized, since various forms of public support for financing education exist in almost all countries, but it does provide one reason why less-educated individuals may have ended up with an inappropriately low level of education.

A second reason for doubting that individuals with low educational attainments have rationally chosen to acquire this low level of education is the likelihood that the benefits of education are not accurately perceived by all individuals. We clearly do not expect children to appreciate fully the benefits of education which must be set off against the costs of acquiring it (in terms of effort): parents are expected to act on their children's behalf in this respect. But parents with little education themselves, who may have had poor experiences with the educational system, are also likely to underestimate the value of education. This problem may be particularly serious in the very early stages of education: to the extent that educational achievements in secondary school and subsequently require as a necessary condition successful primary education, it is

very important to try to make education for very young children enjoyable (low-cost in terms of effort), in order for it to be effective.

A third reason, related to the previous one, concerns the nature of education as a good. Many parents, and their children, know very little about what sort of education is being received. Most people have very limited experience of different forms of education, and they are very dependent on the information provided by teachers at schools and colleges in order to judge whether their children are receiving the appropriate form of education, and whether it is worth acquiring more education. It is no criticism of teachers or parents to say that in a situation where a child's performance at school depends on the parents' attitude to education, and the information about education provided by teachers, it is very likely that by the age of 16 many children will find themselves with a level of education which cannot be said to have been the outcome of a rational choice.

Low educational attainments may also not reflect individuals' rational choices because of imperfections in the institutions which supply education. In most advanced economies, the dominant supplier of education is the public education system, which generally enjoys something close to a monopoly position. It is widely recognized that there are localities in which the public education system fails to provide an adequate quality of education. Even where alternative suppliers exist, as a rule they are only accessible to the better-off. Less well-off children, even if they or their parents would rationally choose a higher level of educational attainment, may not be able to obtain it because it is not supplied by the monopoly producer, whether for economic or for political reasons. The inability to obtain an adequate quality of elementary education from monopolistic suppliers may in turn prevent children from being able to take advantage of (or even gain access to) secondary or post-secondary education. Where this is the case, children's low attainment in post-elementary education cannot be regarded as an outcome of rational choice, but rather of constrained access to supply.

The arguments above suggest that the objective of improving the educational attainments of average- and below-average school-leavers in advanced countries remains a sensible one. How to achieve this objective is a complex and difficult question, as will be clear from what has been said in this paper. Achievement of this

objective requires more than just developments in the educational systems of advanced countries, but such developments are certainly necessary if the objective is to be achieved. Carl Bereiter's paper reports the results of work in cognitive science which is relevant for improving the way children learn, but it is disappointing to us in that it appears to treat children in general as having homogeneous requirements for improved methods of learning and acquiring education. The analysis in this paper suggests that a more differentiated approach to education in advanced countries is required. To put it bluntly, there are relatively few problems of any significance in the education that is received by high achievers in these countries, but there are serious problems in that received by low achievers, particularly in the U.K. and the U.S.A. From an economist's point of view, in allocating resources to pursue the educational objectives advanced in Bereiter's paper, it would be most important to focus on improving the educational experience of low achievers.

Indeed, from a historical point of view the major difference between educational objectives in present-day 'knowledge societies' and in past ones may reside precisely in this question of how widely and equally dispersed education is across the whole population. The main difference between past and present-day 'knowledge societies' may not be the importance of knowledge, but rather the fact that in past 'knowledge societies', only a minority of economic agents transformed knowledge, while the remainder of the population did routine tasks because there were no machines to do them. Consequently, these societies could get by with education systems focused only on a small elite group. Nowadays in advanced economies a much larger proportion of people have to be able to transform knowledge, and this poses new challenges to educators. The distinctively new feature of present-day societies, compared to past ones, is not the economic importance of knowledge transformation, but rather the economic importance of transmitting knowledge-transforming skills to the entire population—not just the most intelligent, or those who have already been enculturated to World 3 in middle- and upper-class families. If this is true, the unprecedented challenge faced by educators in advanced countries today is not that knowledge transformation has become important for the first time in history, but rather than for the first time in his-

tory it has become essential to lower the costs of education for social groups which in earlier eras remained uneducated.

We are aware that some may find difficulties with our conclusion that the economic evidence shows no obvious problems of any significance in the education received by high and medium achievers. 'How do economists know,' a businessman may object, 'that the supply of human capital in our economy is sufficient for the demand? Think how much better I could do in my business if my electrical engineers could add, or my production line people could read the instructions on the machines they use every day. All you're saying is that I can stay in business given the current level of education of my employees. But you have no evidence that my firm wouldn't be substantially more profitable if education were improved—not just for the lowest achievers (whom I am not employing anyway), but across the board. Certainly I, for one, could produce more at lower cost.'

One response to this would be to say, 'All right, if education is so important to you, are you willing to pay higher wages to get it? Otherwise, you're basically saying you'd like to be able to purchase a better grade of *any* input—bauxite, for instance—at the same price as the present low grade ore you currently purchase—in other words, you'd like a subsidy to your production costs.' A recent survey of businesses' expenditures on employee training suggests that there is a sense in which businessmen who complain about low levels of worker skills are not willing to put their money where their mouths are. Recent studies show that in the U.K. there has been little change since 1985 in the amount of off-the-job training or the percentage of workers participating in it, that spending on training has fallen since 1993, that half of British businessmen preferred to poach trained workers from other firms rather than train their existing employees, and that half of British companies fail to spend their annual training budgets. The article concludes that "When push comes to shove, British bosses—like many of their peers in other countries—are dubious about the merits of training" (*Economist* 1997, p. 104). If this is the attitude of businessmen to spending money on *training*, which is oriented specifically to their firms' needs, one can only conclude that their attitude to spending money on *education*, directed at inculcating general skills such as arithmetic and reading, would be even more restrained.

A more differentiated response to the employer's point might agree that it does seem unreasonable that an employee should have spent 16 years in full-time education, should clearly have been intelligent enough to get a university degree in, say, electrical engineering, and yet not be able to write a coherent report or add up without a calculator, skills we think of as ones people should be able to learn in grade school. This surely does suggest a failure in the education system, even for medium and high achievers. The economist would respond that one would expect the higher salaries earnable by electrical engineers who can write compared to those who cannot write gradually to feed through to more people equipping themselves with this combination of skills. But we have already seen the factors which may mean this takes place slowly or insufficiently: firstly, education is a long-term decision; secondly, individuals do not necessarily accurately perceive the benefits of higher training; and thirdly, parents and children are dependent on what the education system serves out to them, and the education system itself may be poorly informed about the economic returns to certain skills, or have no incentive to provide these skills even if it is aware of their returns to individuals. This means that there may indeed be some role for improved education provision as a way of providing that electrical engineer with a higher level of skills with the same 16 years of education input, and thus of providing his employer with a higher level of skills in his employee at the same wage cost. The same imperfections in the education market which lead the lowest achievers in the U.S. and the U.K. to get inappropriately low levels of education may also to some extent be affecting medium and high achievers. It may be this which prompts the concerns of employers about the skills shortage, and the persuasiveness of the futuristic business literature in claiming that the education system is failing almost all of its 'customers'.

It is therefore *possible* that education failures are taking place among medium and high achievers as well as low achievers. However, there is *clear empirical evidence* that education failures are taking place among the low achievers, and that these failures are quantitatively quite significant. In our view, therefore, the main priority, especially in the U.S. and the U.K., must remain to address the education problems of low achieving learners. We are aware that this has long been a major focus of some cognitive scientists—

including contributors to this volume. However, we are concerned that taking on board the futuristic business literature, which implies that the education system is equally failing *all* students, may diffuse the efforts which cognitive scientists and education planners ought to continue to focus unrelentingly on *low-achieving* students.

A further implication of our discussion would be as follows. Insofar as a significant minority of low-achieving children are not investing in an optimal quantity of education because they do not have an accurate perception of the benefits, and insofar as this misperception of the benefits is particularly acute among very young children, then this would imply that a particularly important priority for cognitive scientists and educators is to reduce the costs of obtaining an education for very young children. This means that the most serious priority may not be to teach the 'imagination and creativity, ability to work in groups, communication skills, information-finding skills, problem-solving abilities, and technological literacy' stressed by the futuristic business literature. To us, these seem to be skills more appropriate for rather older pupils, who have already overcome the early barriers to learning. The main problem may be to devise pedagogical approaches which lower the cost to disadvantaged 4-, 5-, and 6-year-olds of obtaining the very basic skills of numeracy, literacy, and enculturation into World 3 which will be necessary for them to participate productively in learning more complex skills such as imagination, creativity, group-work, information-finding, and technology in later school years.

To sum up, it seems to us that the futuristic business literature is identifying educational objectives which are more relevant to medium- and high-achieving students who are already securing levels of education which equip them reasonably well for a knowledge society. The economic literature we have surveyed in this paper, by contrast, would identify a major educational objective as being to devise ways of enabling low-achieving students to walk, before teaching high-achieving students how to run. Ideally, of course, we would all like the education system to serve both objectives. However, the economic findings we have surveyed in this paper suggest that the real failure of the education systems of advanced countries today is disproportionately concentrated within a rela-

tively small group of children who cannot afford the current costs of an education (in terms of personal effort and disutility). As a consequence, these children are currently destined to adult lifetimes of very low wages and very high unemployment, and it seems probable that they will pass on their perceptions of the relative costs and benefits of education to their own children. This is costly not only for such individuals, but for us all, and for generations of disadvantaged children to come. In summary, from the point of view of production, the economic evidence is very clear about what our major educational objective should be: the single thing most worth doing is to raise the education levels of the least educated.

What implications do the economic considerations discussed so far have for the liberal education tradition? Liberal education is defined as consisting of those arts and sciences which are 'liberal' rather than 'mechanical' or 'servile'—that is, those disciplines and activities which are "directed to general intellectual enlargement and refinement; not narrowly restricted to the requirements of technical or professional training."²⁴ In our view, the economic findings surveyed so far suggest a generally positive but rather narrow role for liberal education. Most formal education in advanced countries still corresponds more or less to this definition of a liberal education (it is oriented toward general intellectual enlargement rather than vocational training), and the economic findings show indisputably that those children with more years of formal education have much better employment opportunities than those who have less. It is unclear precisely what characteristics of education make people more effective as producers, but it is clear that something about it does so. If Bereiter is right, it may be that it is because the liberal education tradition focuses on enculturation into a cosmopolitan 'World 3', and such enculturation is the most effective way of teaching the skills people subsequently use to be efficient producers. If this is true, then liberal education can be

24. *Compact Oxford English Dictionary*, p. 967, (p. 881, col. 3). The first quoted use of the term in English was in 1375. Its use over the last six centuries reflects lively debate about which disciplines and activities are included in a liberal education, but the criterion has continued to be the distinction between the 'liberal' (those 'arts' and 'sciences' considered 'worthy of a free man') and the 'servile' or 'mechanical' (those disciplines oriented toward technical or professional training).

assigned a role as a sort of handmaiden to the acquisition of economically useful skills. From this perspective, economic considerations would assign a positive but somewhat 'mechanical and servile' role to liberal education.

II. Education as a Way of Training Effective Consumers

But is this all an economist would say in support of a liberal education? In our view, even from a strictly economic perspective, this is an unnecessarily limited assessment of the role of a liberal education. This assessment results from a common tendency, by economists and businessmen alike, to focus on education exclusively as a way of training people to be good *producers*. In the remainder of this paper, we suggest that this exclusive emphasis on production has led to the neglect of an equally important educational objective, namely to enhance people's skills as *consumers*. This is particularly important in advanced countries, where markets offer an extremely wide choice of material and cultural goods, and impose correspondingly wide demands on consumers' ability to evaluate their choices. We suggest that widening the focus to regard education as encompassing consumption as well as production skills poses interesting new challenges for cognitive research and for education planning, and assigns a less 'servile' and 'mechanical' role to 'liberal education'.

Our point of departure is the fact that although economic research suggests that education is generally good for production, there is very little evidence about what precisely it is about education that is good. Indeed, given this lack of evidence, it is at least theoretically possible that if education is viewed solely as a way of making people good producers, a substantial increase in the vocational component of education at the expense of a corresponding decrease in the liberal component could be justified as an educational objective. A case could be made that an education more directly targeted toward professional skills would have advantages over one 'directed to general intellectual enlargement and refinement'.

Intuitively, however, most of us—even the most hard-nosed economist among us—would oppose this idea. But on what grounds? One might simply invoke moral absolutes and assert that

the knowledge of elite culture embodied in a 'liberal education' has an absolute worth which justifies forcing children to allocate resources to it. But in our view there may be a more analytical reason for supporting the idea of a liberal education, one which derives support from some very recent currents in the economic analysis of how people form their preferences and consumption habits.

Advanced countries today are often described, in uncomplicated terms, as 'consumer societies'. One of the most widely decried aspects of 'consumer society' is the tendency of uneducated consumers to prefer goods that require little investment to consume: they prefer television to novels, Jackie Collins to Jane Austen, Stallone movies to avant-garde French cinema, Madonna to Beethoven, astrology to astronomy, futuristic business literature to economics journals, and generally pop culture to elite culture. One doesn't have to be a snob or a socialist—one doesn't have to disrespect popular tastes, or believe that choices should be taken out of people's hands—to think that people are often making low-quality decisions, perhaps simply for lack of better training. On the other hand, there are also people who choose to consume elite culture, not because they think such culture is morally 'better' (although they may hold this view) but because they enjoy it more.

Traditionally, economists have had very little to say about how people form preferences. Most of modern economics proceeds on the assumption that preferences are given, that they are relatively stable, and that their main determinants are basic biological needs: food, drink, shelter, and recreation. But it's quite obvious that in advanced economies the average person's choice of consumption doesn't have much to do with these basic needs. Instead, it appears to depend on childhood experiences, social interactions, and cultural influences. Recently some economists—notable among them Gary Becker, in his recent book *Accounting for Tastes*—have begun to try to develop more analytical ways of understanding how people form their preferences and why they get into the habit of consuming particular things.²⁵

25. Becker 1996, p. 3.

The point of departure is something economists term an individual's 'discount rate', the amount by which he or she discounts future over present happiness.²⁶ Traditionally, economics assumed that discount rates, although they differed among individuals, were constant and fixed for each individual.²⁷ Empirically, however, discount rates not only vary systematically according to people's personal characteristics (such as age, income and education), but also change over time for the same individual.²⁸

To explain why this might be the case, economists such as Becker postulate that a person's discount rate—how much that person takes future satisfaction into account in current decisions—depends on his or her ability to imagine what future satisfactions will be like. This ability is determined partly by inheritance, but also partly by the individual's choices, in particular the choice to spend resources (time, effort, goods) in producing 'imagination capital' that helps the person better appreciate what future satisfactions will be like.²⁹ More concretely, economic studies exist which suggest that education, parental training, addiction to drugs, and religion all affect people's ability to imagine and appreciate the future, and thus affect how much they discount future over present consumption.³⁰

How much 'imagination capital' people have will in turn affect which goods they prefer to consume. If you have a lot of imagination capital, you will place greater weight on future consequences of current choices. This will make you more likely to do things which increase your future happiness, even at the cost of current happiness. You will be less likely to become addicted to harmful substances. You'll be more likely to take exercise or turn up to work

on time. And you will more likely at least to try forms of consumption with higher initial costs but potentially high future returns (such as listening to Beethoven or learning to play a musical instrument yourself) instead of sticking to Madonna.

Here's where a second aspect of the new economic analysis of preferences comes in: the economic analysis of habit formation. Economists have analyzed the behaviour of people who engage in habitual or addictive activities—not just 'harmful' habits such as tobacco addiction or gambling, but 'beneficial' habits such as saving money, staying with your spouse, or listening to Beethoven.³¹ And they have found that although clearly in some habits purely chemical and medical addiction plays a role, in almost all habits—including chemical addictions—so too does something called 'reinforcement'. 'Reinforcement' means that an increase in current consumption of a good will tend to raise demand for the consumption of that good in the future. In economic terminology, past and present consumption of tobacco (or Beethoven) are complements—the more you consume it now, the more you will consume it in future. This is true to some extent for many goods, but it applies more to certain goods than to others.

The economic analysis of preference formation and consumption habits is still in its infancy. However, if its early results are to be relied on, they would imply a whole new set of economic objectives for education. They would imply that education be viewed not only, or even primarily, as an investment in human capital in the sense of *production* capital (which is the sense in which the term 'human capital' is invariably used). Rather, education should also be viewed as an investment in human *consumption* capital.³² Education is an activity which, economic studies suggest, tends to lower people's discount rates, that is to increase the weight they place on future compared to present consumption. This in turn makes them more willing to engage in forms of consumption which

26. A discount rate is the proportional amount by which the additional future consumption required to compensate an individual for a unit decrease in current consumption exceeds 1, when the individual is consuming equal amounts of current and future consumption.

27. It has even been argued recently that the ability to anticipate future utilities has a strong biological component; see Rogers 1994.

28. Becker 1996, pp. 10–11.

29. Becker and Mulligan 1997.

30. See, for instance, Becker 1996, pp. 3–23, 118–138; Akabayashi 1995, cited in Becker 1996, p. 11.

31. Stigler and Becker 1977; Becker and Murphy 1988; Becker, Grossman, and Murphy 1991; Becker, Grossman, and Murphy 1994; Becker 1992; Becker 1996, pp. 8–10.

32. Becker 1996, pp. 4–5, puts this point quite forcefully: "Although the human capital literature has focused on education, on-the-job training, and other activities that raise earnings, capital that directly influences consumption and utilities [is] sometimes even more important."

have beneficial rather than harmful future consequences.³³ Once a person has begun a certain beneficial (or harmful) consumption habit, he or she is likely to continue doing so because of 'reinforcement', the complementarity between present and future consumption, the fact that once you learn how to generate satisfaction from a particular activity you will be more productive at generating satisfaction from that activity in future, and therefore be more likely to engage in it.

From this point of view, we can arrive at a conclusion about educational objectives that is much more favorable to traditional ideas of 'liberal education', and also to Bereiter's idea of making World 3 more central to it. It can be argued that, historically, ideals of liberal education have always been geared to consumption rather than production. In antiquity, they focussed on making the educated individual a better person, not so much in the sense of being more useful to society, but in the sense of enabling him or her to lead a better life, to make consumption decisions with longer time-horizons, and not simply to choose on the basis of immediate pay-off. In more recent times, especially in democratic societies, there has been an added emphasis on making the individual a more intelligent *political* consumer, one who is better able to judge political and social proposals, not just on their immediate pay-off but on their long-term consequences.

Regarding education as a way of making people better consumers as well as producers suggests a number of additional educational objectives. For one thing, it may be the case that the minority of children whom the education system is failing (to the extent that this is reflected in their low education levels, low wages and high unemployment in later life) are those for whom discount rates are, for some reason, particularly high. One reason a child may have a high rate of discounting future over present benefits may be family background and pre-school experiences. Once it is recognized that discount rates vary, one objective for the very early years of education might be to overcome the problem of high discount rates for those children who suffer from them.

33. Becker 1996, pp. 11, 63, 82-83; Farrell and Fuchs 1982; Chaloupka 1991; Townsend 1987.

One way of approaching the problem of high discount rates has already been discussed. This is to make education less costly (in terms of boredom or frustration), so that highly-discounted expected future benefits may still have a chance of outweighing these costs. But this is only a palliative, not a solution. The problem of a high rate of discounting future over present benefits will still dog that child into the future and limit his or her capacity to invest in education and many other beneficial activities throughout life.

A more fundamental approach to the possibility that a substantial minority of children come into school with much higher discount rates than the rest, rendering them less able to learn even at similar levels of native intelligence, would be to devise pedagogical approaches which might lower these children's discount rates. This approach would not focus so much on making education low-cost, but on making education a higher-return activity, by equipping children with the 'imagination capital' which would enable them to value future benefits more highly relative to current ones.

As mentioned above, analyses of forms of consumption such as smoking, with low present costs and high future ones, show that, holding other measurable variables constant, higher levels of education are associated with lower rates of discounting the future over the present. Economists have concluded from this that education tends to lower an individual's discount rate. But they don't know why. In our view, it is even possible that there is in fact no causal link between education and discount rates. The empirical findings may simply reflect a selection bias: individuals who inherently have low discount rates are more likely both to educate themselves and to refrain from forms of consumption with high future costs. But it is also possible that education itself plays a role in reducing discount rates. Perhaps cognitive scientists may be able to establish if this is the case and why it might be so. If it does turn out to be the case, they might even suggest ways in which children who enter school with high discount rates can be assisted to achieve lower ones.

The analysis of how people form consumption habits also has a further potential implication for educational objectives. Economic analyses suggest that human beings have a strong tendency to form habits; as Gary Becker puts it, "Habit helps economize on the cost of searching for information, and of applying the information to a

new situation . . . And most people get mental and physical comfort and reassurance in continuity to do what they did in the past."³⁴ Habits can be either beneficial (turning up to work on time, practicing the piano, reading informative or stimulating books) or harmful (using certain drugs, gambling, over-eating). Once a habit is formed, it appears to be self-sustaining, because of 'reinforcement', the existence of high complementarities between present and future consumption of the particular good involved. Moreover, both theory and empirical findings suggest that young people have a greater tendency to form new habits than do older people.³⁵

These findings imply that a possible objective for education is to ensure that children, while they are still very young and open to forming new habits, experience beneficial forms of consumption which may then become habitual through reinforcement. Economists observe empirically that some forms of consumption are much more habit-forming than others, and describe them as being goods with higher complementarities between past and future levels of consumption. But economists don't know why some goods have this habit-forming characteristic. Cognitive scientists may be able to isolate precisely what *kind* of learning experiences do have this habit-forming reinforcement characteristic and which don't. If such habit-formation is important, then cognitive science may be able to tell us which parts of the world of liberal education are likely to be more or less beneficially habit-forming for children of particular backgrounds, sexes, and ages.

III. Scarce Resources and Competing Ends: Are Some Parts of World 3 More Important than Others?

Viewing education as investment in consumption will also help us in the all-important question left open by Bereiter's proposal, which is the one with which we should like to conclude our paper. This is the question of what precise skills and knowledge should be made central to education. Human knowledge is very large, if not infinitely so. Yet the resources, not just of money but of time and

34. Becker 1996, p. 122.

35. Becker 1996, pp. 31-33, 59-60, 81-83.

effort, which can be allocated to learning it are inevitably limited, even in the most generously funded education system. Education planners, parents, teachers, and students need some guide to those areas to which these limited resources may be most productively allocated. Bereiter goes part of the way toward providing an answer when he concludes that enculturating children into World 3—the world of ideas—is the best way of enabling them to find out for themselves the knowledge and skills they will need when they come to work as adults in a 'knowledge society'. However, World 3 itself is a very big place and the question which automatically arises in an economist's mind is the following: in the view of cognitive science, are all parts of World 3 equally productive ends to which to allocate scarce resources in education?

Bereiter's proposal implies that this question doesn't matter: that learning *anything* about the topography of World 3 is more important than a detailed knowledge of particular regions of it. But is this true? Are not some regions of World 3 more productive places to begin, if one wants to learn about the other regions of this world? To extend the metaphor, aren't there—on the one hand—mountain tops from which one can see wide lands to be discovered, advantageous ports, and navigable rivers; and—on the other hand—trackless forests and arid deserts? Is it not possible that one of the reasons old-fashioned 'rote learning' began to be so widely criticized in the 1960s was that it focussed too much on areas of World 3 which appear trackless and arid to all but a small elite of highly intelligent (or already enculturated middle-class) learners?

The new economics of preference formation and consumption habits would suggest that, if one views education as an investment in human *consumption* capital as well as human production capital, then one over-riding consideration—practically never raised in educational debates—will be to make sure that all children, or as many as possible, undergo the experience of consuming something that requires a considerable investment. If this consumption object is also to be part of a cosmopolitan World 3, in Bereiter's vision of it, we have narrowed things down a good deal. But here we should like to stop, and invite discussion from people who specialize in the other side of the question: the technologies with which educational objectives can be achieved.

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Liberal Education in a Knowledge Society

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