THE ECONOMICS OF EDUCATION

Module I. Introduction: The Economics of Education in a Global Economy

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Introduction

The economics of education is a relatively new field, less than 50 years old. However, as the importance of education increases because of economic globalization and the rise in production of science-based goods and services, the economics of education has also flourished.

Economics provides a unique perspective on education. Unlike educators, who are mainly interested in how children learn, economists focus on the value of education as an investment and consumption good, and on education as an activity that uses enormous amounts of society's resources in order to achieve both explicit and implicit social goals. Economists want to know how effectively and efficiently resources are being used to achieve these goals, whatever they may be.

This Introductory Module presents the rationale for an economics of education and discusses the most important concepts underlying how economists have looked at education. The Module is divided into four parts. In Section 1 we review the rationale for using economic theories to study education. To many, using economics to study education is irrelevant and unnecessary. Yet, for better or worse, economics has done much in the past fifty years to redefine how the public and educators perceive education. Section 2 provides a brief history of the approaches economists have taken to analyze education. These approaches have evolved over time, shifting reform rhetoric from increasing educational attainment to increasing educational achievement at a given level of schooling, say primary school. Section 3 analyzes key, but rarely discussed issues in the economics of education, namely the role of the national state in supplying schooling and training and the changing role of the state in a globalizing economy.

Learning Objectives

Upon completing this module, you should be able to do the following:

1. Understand and explain the role of the economics of education in the science of education.
2. Identify and describe the different phases of the history of the economics of education.
3. Understand the main elements of the theory of human capital.
4. Understand and describe the role of the state in producing education.
5. Understand the meaning of social capital and its role in the economics of education.
6. Describe how globalization affects educational demand and supply through changing labor markets and changes in the role of the state.

Work Plan

To reach the learning objectives listed above, you should read each section and then undertake the activities listed at the end of each section. The activities, the necessary steps to undertake them, the approximate time required, and resources you will need are listed below

Activity	*Steps*	*Estimated Time*	*Necessary Resources*
Section 1 Questions	Read and answer questions at the end of Section 1.	1 hour	1. Section 1 of this module 2. OECD report: *Education at a Glance: Education Indicators 2004.*
Section 2 Questions	Read and answer questions at the end of Section 2.	1 hour	1. Section 2 of this module
Section 3 Questions	Read and answer questions at the end of Section 3.	1 hour	1. Section 3 of this module Some additional readings suggested in Section 3.
Section 4 Questions	Read and answer questions at the end of Section 4.	1 hour	1. Section 4 of this module

1. Why is there an economics of education?

Why do economists study education? Is not education about learning, child development, and good teaching? What does this have to do with economics?

There are three main reasons why economists are interested in education:

- A great deal of money is spent on education every year in almost every country of the world, part by parents directly and part by taxpayers, whether they have children or not. Parents are particularly concerned about whether the money they invest in their children's education has a high or low payoff. This concern is just as great for a peasant farmer in a Guatemalan village as it is for a middle class suburbanite in the United States or Europe. Taxpayers (and politicians) are concerned that the money that goes for education is having a positive effect in some way.

- The education system is one of the, if not *the*, largest employers of educated labor in most economies.

- Most governments believe that in today's globalized knowledge economy there is some connection between a more educated labor force and increased economic growth.

One way to understand the importance of the economics of education is to review each of these reasons in more detail.

1.1. Education is a major private and public investment

In almost every country of the world, education is a huge industry. For example, in the United States, about fifty million young people attend schools from kindergarten to twelfth grade, ninety percent of them in public institutions. Another 12 million go to colleges, again a high percentage public. The total annual government investment in this system is more than 600 billion dollars, but that does not include private spending on tuition, books, supplies, pre-schools, and the time parents invest in school activities. The total bill may be close to a trillion dollars per year.

The extent of public educational effort varies from country to country. In Spain, for example, the numbers are smaller in terms of per student costs and national product. Almost seven million students attend Spanish schools from pre-school to bachillerato (academic high schools) and formacion professional (technical high school), of which almost 70 percent are in publicly run institutions. Another 1.5 million students go to universities, 90 percent in public universities. The total annual government investment in the system is 35 billion euros, or 4.4 percent of national product, and families spend

another 8.5 billion euros, according to consumption surveys. This adds up to more than 5,000 euros per student and 5.4 percent of national product, but is still much less than per student spending in the United States.

Activity for Section 1. Why do you think that Spain spends less than the United States per student? Do you think that Spaniards are less willing to spend on the education of their children? Do you think that labor (teachers) is paid relatively less in Spain? Do you think that the Spanish education system is just more efficient than the U.S. system? How would you find out which of these possible answers is the correct one?

Parents are concerned about their children's education, today more than in the past. Yet, even fifty years ago, having a child finish secondary school was an important goal for most parents in Europe and the United States, and for many, so was a university education. Such goals reflect the value that societies place on education, and part of that value is economic. In general, those in the labor force with more schooling earn more than those with less schooling. Schooling is also a costly good to buy. Someone has to pay for teachers' time, for books, supplies, classroom space, the electricity and fuel to light and heat schools, and for the transportation to bring children to school.

Is all this expense worth it? How do we measure the economic value of schooling? Who should bear the cost of schooling? Should schooling be a public good, paid for out of general taxes imposed on everyone, including those without children in school? Or should parents who send their children to be educated be made to pay the full price of providing that education? These are just some of the questions asked in the economics of education.

The economic value of education is perhaps the most important of these questions, and the one that has preoccupied economists earliest and longest. In the early 1960s, when economists were first thinking about the economic of education, Theodore Schultz, a professor of economics at the University of Chicago, who later received the Nobel Prize in economics, wrote:

> The economic value of education rests on the proposition that people enhance their capabilities as producers and as consumers by investing in themselves and that schooling is the largest investment in human capital. This proposition implies that most of the economic capabilities of people are not give at birth or at the time when children enter upon their schooling. These acquired capabilities are anything but trivial. They are of a magnitude to alter radically the usual measures of the amount of savings and of capital formation that is taking place. They also alter the structure of wages and salaries and the amount of earnings from work relative to the amount of income from property (Schultz, 1963, pp. 10-11).

As we shall see, determining the economic value of education is not a simple issue. Although we know that individuals with more schooling earn, on average, more income and have higher status jobs, it is not clear whether they earn higher income because schooling taught them skills that are more highly valued by employers, or

whether schooling merely certifies that smarter, harder-working, more disciplined individuals—who would be more productive whether they took more schooling or not—are more likely to finish higher levels of schooling. More schooling may just provide a "signal" to employers that these are the smarter, harder working, and more highly disciplined individuals—the qualities for which employers are willing to pay higher wages.

Since education is such an expensive product to buy, economists have also long been concerned about who should pay for it. Should schooling costs be borne by individuals and their families? If all the benefits of schooling accrued to individuals, there would be a good case for making education a totally private good. But most societies have reasoned that there are benefits to the society as a whole from having an educated population. If that is the case, then spending on schooling has value that benefits even those who do not take more schooling. If everyone had to pay privately the full cost of their education, they would take less schooling than socially desirable. In that case, even those that do not take more schooling should be willing to subsidize those who do. Thus, education is at least partly a public good.

1.2. Education is a major employer of educated labor

In almost every country of the world, the education system is the single largest employer of professional workers. Economists are interested in the labor market for skilled workers because they provide services that are difficult to produce with other inputs. For example, medical services depend heavily on the supply of doctors; the legal system depends on the supply of lawyers; the construction of roads and bridges and machinery, on engineers. Similarly, the provision of schooling depends on the supply of teachers.

The economics of education focuses on teachers for two reasons: the first is that teachers are the main and most expensive input in a large, growing, and increasingly important industry; the second is that, in most economies, teachers are the single largest group of professional workers, hence one of the most important products of the educational system itself.

Teacher labor markets are also interesting to economists on other grounds. Teaching is a highly feminized profession, in part because professional women's wages are lower than men's, which lowers the cost of providing education services. In addition, most teachers are public sector workers. Although the public sector generally pays lower wages than the private sector, in the case of women, the opposite has been true, at least until recently. So the economics of teacher labor markets is a mix of traditional labor market economics and public policy regarding the provision of an important public sector good and public policy regarding women's wages relative to men's.

Because schooling is such a labor-intensive profession and teacher labor the main cost, the economics of education have been focusing increasingly on the efficiency of teachers and teaching. One question they ask is: what are the characteristics of teachers

that produce the highest educational output? Other questions concern whether the public sector pays teachers in a way that is most likely to recruit the best talent into teaching and to keep that talent in teaching. Economics of education also asks whether current wage structures provide the right incentives to teachers to exert the greatest effort to increase students' academic achievement.

1.3. The role of education in economic growth

Individuals are interested in taking more schooling partly because they can earn more and get better jobs, on average, with more schooling. Similarly, nation-states and regions are interested in raising the average level of schooling in their labor force because they think that doing so will improve productivity, hence economic growth. Some of the earliest work in the economics of education argued that a major effect of more education is to improve labor's capacity to produce. Because better-educated workers are more literate and numerate, they should be easier to train. It should be easier for them to learn more complex tasks. In addition, they should have better work habits, particularly awareness of time and dependability.

Nations with more educated labor forces are characterized by higher output per workers, but typically these nations also have more physical capital per worker. But exactly how education increases productivity, how important it is, and it what ways it is important are difficult question which economists have been unable to answer definitively. A shortage of educated people may limit growth, but it is unclear that a more educated labor force will increase economic growth. It is also unclear what *kind* of education contributes most to growth—general schooling, technical formal training, or on-the-job training—or what *level* of education contributes most to growth—primary, secondary, or higher education.

One of the clues that education does contribute to growth and how much it may contribute is that countries with higher levels of economic growth have labor forces with higher levels of formal schooling. This may just indicate that as individuals earn more income, they purchase more schooling for their children, just like they would buy a refrigerator or a family automobile. In that case schooling would be primarily a *consumption* good, not an *investment* good like a machine or a computer system. However, economists have been able to show that, *on average*, countries that have sustained high levels of economic growth are also those who have higher levels of literacy and have invested steadily in raising the education of their labor force.

Another clue that education contributes to growth is that individuals with more education have higher earnings. Higher earnings for the more educated may just represent a political reward that elites give their members—a payoff for being part of the dominant social class. However, it would be difficult to sustain an economic system very long if those who actually produced more were not rewarded for their higher productivity, and those who simply had political power got all the rewards. One of the reasons that state socialist systems in Eastern Europe were unable to sustain economic growth was almost

certainly due to an unwillingness to reward individuals economically on the basis of their productivity, and instead, to reward the politically powerful with economic privilege.

The positive economic payoff to individuals with more education in the form of higher earnings suggests that their economic value to the society is higher than those who have lower education. Economists estimate the payoff to more education relative to the cost of that education just like they would estimate the payoff to any investment. They calculate what the amount invested in education yields in higher earnings over the lifetime of those with more education. This *rate of return* to the investment in education is generally positive in almost every country. In Europe, rates of return are about 7-8 percent, but in many developing countries, they can be much higher. In Chile, for example, the rate of return to the investment in education is more than 12-14 percent. A positive rate of return to education suggests that investing in education contributes to economic growth. The higher the rate of return, the more likely that investment in education contributes to growth. We shall discuss rates of return to education in much greater detail in the next Module.

More Activities for Section 1.

1. List the positive and negative reasons why educational systems are likely to hire teachers and evaluate them differently than professionals in other industries. Who are public education teachers in most societies?
2. Can you think of some evidence that investment in public education has contributed to economic growth in your local community? In your state or region? In the United States? Can you think of some evidence that it has not contributed to economic growth? Which level of education do you think contributed the most to economic growth? Why?

2. A brief history of economists' (lack of) interest in education

2.1. *The mode of production under lays the role of educated labor*

Economists, like any social thinkers, are strongly influenced by the world around them. The dominant mode of production in any historical time period is the primary concern of those who analyze economic and social relations. The main sources of wealth in Europe's feudal times were land and illiterate labor, which did not own the land it worked. Social relations were based on birthright (land ownership), not merit. The educated were the aristocracy and clerics (who learned to read religious scriptures). In Asian societies, there were variations of feudal relations of production, but land ownership and birthright were closely intertwined, as in Europe. Of course, nomadic societies differed, and were usually more equal, but social and economic roles in these societies were also generally ascribed.

Because of ascription of roles and the dominance of land as a source of wealth (and acquisition of land through military power), education seemed to have little

influence on production. Of course, even in feudal times, a commercial class developed that was probably literate and certainly numerate, and this commercial class played a role in economic development. But early economists such as John Law (1671-1729) and Adam Smith (1723-1790) were much more concerned with understanding the existing system. Law focused on the role of money. Smith, three-quarters of a century later, was able to observe an emerging industrial production, the increasing role of markets in allocating goods and services, including labor, and the rise of agriculture as a business rather than a way of life. He probably should have focused more on the role of education in differentiating labor. Yet, since the main economic transformation at the time was the disappearance of feudalism and the rapid decline of the post-feudal monarchic state, Smith rightly directed his analysis to understanding the underlying economic theories of the emerging market system. As most labor was undifferentiated agricultural labor, Smith's general assumption of homogeneous labor was a reasonable approximation.

Smith does discuss education. He argued that wage rates would be higher for trades and professions that were more time-consuming to learn and therefore required postponing earnings, because people would not be willing to learn them if they were not compensated by a higher wage. [He also argued—somewhat incorrectly—that wage rates would be higher for workers in dirty or unsafe occupations, such as coal mining, and for those who performed socially undesirable jobs, such as today's garbage collectors.] Smith's ideas about "compensating wage differentials" are related to today's ideas about human capital, in the sense that acquiring skills requires an investment of time and effort which represents an investment. If the return on that investment is low, few, if any, will be induced to make it. Smith was also concerned with the education of the poor, but not for reasons of bringing up their incomes. Rather, he argued that education of the poor was needed to teach them the values and morals needed to maintain the fabric of civil society. Nevertheless, Smith did not see education as an important component of the "wealth of nations" for the simple reason that educated labor was far less important to understanding the main transformation taking place in economic systems in his time than the division of labor and the allocation of capital and resources to different economic activities.

Other classical economists, such as David Ricardo, John Stuart Mill, and Karl Marx remained in the Smith tradition of considering labor as a homogeneous input into production. These philosophers of the industrial revolution focused on understanding the capitalist mode of production and its economic and social implications. Since the market and capitalist accumulation were the driving forces of capitalism, labor was seen largely as a necessary an important input into production—so important that Ricardo and then Marx defined economic value in terms of the hours of work required to produce a good and the average wage paid to labor. Nevertheless, the main differences between industries for Ricardo were determined by the amount of capital invested per worker, not differences in labor skills.

For Marx, differences in labor were defined mainly by whether they were employed by an owner of capital (proletariat), were small-scale merchants (petite bourgeoisie), or worked at the fringes of capitalism (lumpen proletariat)—today's lower tier of informal labor markets. Marx's definition was governed by political

considerations. He was trying to show how capitalism engendered the seeds of its own destruction by the law of declining returns to capital, taken from Ricardo. He also was influenced by Ricardo's view of technological innovation, which argued that investment in machinery could increase profits and the accumulation of capital but had to be financed out of lower wages. Hence, Marx was convinced that the expansion of capitalism necessarily involved the increased exploitation of (homogeneous) industrial labor (the proletariat), declining wages, and, ultimately, the overthrow by the proletariat of the system exploiting them, much as the bourgeoisie had overthrown the remnants of the feudal system that exploited them. Education or technological innovation (except to replace labor with capital, driving wages even lower as labor competed for fewer jobs) and its effect on work differentiation, played essentially no role in this model.

In the early twentieth century, Irving Fisher, an American economist most closely identified with modern monetary theory, wrote extensively on the definition of capital and income, a subject of great interest to economists throughout the nineteenth century. Fisher tried to break with traditional views of capital by defining capital as any asset that produced income and the value of capital as the "discounted value of expected income." This definition included a person's own skills as an entrepreneur or professional or skilled worker. Nevertheless, most economists of the time did not agree with Fisher. They argued that capital embodied in human beings could not part of the definition of capital because it could not be bought and sold or lent to others for the purposes of earning interest. Nor could businesses include it as part of their assets in order to borrow against. Thus, Fisher's definition of capital was put aside until fifty years later when economists rediscovered it and put it to use to develop better explanations of economic growth.

2.2. *The Development of Human Capital Theory*

In the aftermath of World War II and in the context of the Cold War, economists developed an intense interest in the causes of economic growth. There were important political factors involved. The capitalist crisis of the 1930s and the emergence of the Soviet Union and China as adversaries of the industrialized capitalist countries for the hearts and minds of millions of people in developing countries placed a new urgency on understanding how to foster economic development under capitalism.

Economic historian Walter Rostow—who later became famous as President Lyndon Johnson's advisor during the Vietnam War—proposed in the 1950s that economies go through determined "stages of economic growth"—that countries had to reach certain levels of savings that would allow them to reach sustained growth, and that all nations went through seven stages to become like the advanced capitalist economies of Western Europe and the United States. Rostow's book was called *The Stages of Economic Growth: A Non-Communist Manifesto*. At the time, the United States and Western European governments saw promoting western capitalist economic growth in developing countries as a bulwark against the expansion of Soviet and Chinese communism.

Other economists, such as Robert Solow, developed economic models using "production functions"—mathematical representations of how inputs are combined to produce outputs—to make estimates that predicted how rapidly countries would grow economically given investment levels and labor force growth. A popular growth model was that economic growth was the result of a change in the number of hours that workers worked during the years plus the change in the amount of capital used in production plus the change in the technological efficiency of the system.

Economists such as Solow thought that if analysts could account for the change in the amount of labor and capital used in production, they could predict a nation's economic growth rate except for the modest residual percentage of change that was due to greater technological efficiency in the economic system. However, when he and others began to estimate changes in labor and capital in various countries, they could only predict about one-half the actual growth rate.

It was unreasonable to believe that one-half the economic growth rate was due to technological change, so some economists, such as Theodore Schultz, looked elsewhere, namely to the idea that by assuming that the labor force was homogeneous, economists were leaving out a major form of capital accumulation—in human beings. Schultz called this heterogeneity of labor, distinguished by differing amounts of education, training, and on-the-job experience, "human capital." He argued that it was a form of capital because it was associated with greater economic productivity. People with more formal education, training, and experience, he claimed, could produce more goods and services because they knew more and were easier to train.

When Schultz introduced this concept in 1959, the developed countries were entering the golden age of mass industrial production. Detroit's assembly lines were producing millions of cars annually, and almost one-third of the U.S. and Western European labor force was employed in manufacturing industries. The prevailing view of development, as expressed by economists such as Rostow and Solow, was that development was a continual process. Countries and firms were classified as successful or unsuccessful economic units according to their capacity to move along a predetermined trajectory and to adapt rapidly to social and economic models imported from outside the firm or country. Economic growth was perceived as depending on the acquisition of technology, capital and organizational efficiency from external sources.

It is important to understand that human capital was "discovered" at this particular historical moment, and its role in production was defined by this predominantly assembly line manufacturing production process. In this view of externally stimulated growth or efficiency, human resources were only considered in quantitative terms—as available labor of varying quality to be combined with existing capital and technology in various productive activities. Human capital was conceived as an *input* into that process. Just as labor was regarded as one of many factors (hours of work) in production with little creative role, education was viewed as an input that when *added* to labor enhanced workers capacity to produce.

2.3 What Is It About More Education that Raises Productivity?

For human capital to be a meaningful economic concept, it has to be associated with higher economic output. However, the conception of human capital as an additional input in industrial production did not seem to fit well with the idea that skills taught in school raise productivity. No one was able to show that workers with more education in a manufacturing plant produced more or even earned more. Yes, it was true that managers in those plants were more educated and earned higher salaries, but they did completely different jobs. By the 1970s economists were struggling with the question of why more education would increase productivity on an assembly line. Economists could imagine that workers with more experience—at least the first year or two—would be more productive than workers just starting on a particular manufacturing job. But why would more educated workers be better factory workers?

A few years ago, we interviewed workers and managers at a *maquiladora*—an electronic assembly plant on the United States-Mexican border—to try to answer this question. The employees assembling the products in that plant were almost all young women from the southern Mexican state of Chiapas, more than 1500 kilometers away. They all had completed primary school. Why did the owners of the plant prefer to hire these more educated young women to perform relatively simple assembly tasks? The main reasons given had little to do with education: the women from Chiapas were harder working and more reliable because this was a good job for them, whereas local young women were already "tainted" by industrial culture—they were "too independent." However, the owners also argued that, since these young women had completed primary school in a relatively low-educated state such as Chiapas, that was a good indicator of their discipline and their "trainability."

Thus, workers with more formal schooling may be more "trainable" and more "disciplined" for having passed time in an institution that socializes children into those behavior patterns. In the early 1970s, sociologists Alex Inkeles and David Smith summarized the case for education preparing workers for factory-type work under the term "becoming modern." Inkeles and Smith suggested that one of the most important features of school was the clock on the wall. As children learned the importance of time (arriving to school on time, spending finite periods of time on different subjects, finishing their work "on time"), they became "modern." This meant that they learned how to deal successfully with modern institutions, such as industrial workplaces. This made them more productive, not least because they were more likely to show up for work every day and at the correct time.

Yet, such broad socialization could be accomplished by simply having workers spend time in industrial workplaces, as Inkeles and Smith showed empirically. Individuals who had spent four years in a factory setting scored about as high on a "modernity index" as an individual with an additional year of schooling. Was there nothing about the skills learned in school that contributed to productivity?

As an agricultural economist, Theodore Schultz thought that he could find the answer to this question in agricultural production. He believed that farmers with more education were more open to new methods of agricultural production, were more sensitive to incentives (price changes) in the market, and were more able to apply new methods to raise agricultural productivity. One other advantage of testing these ideas about education and productivity in agriculture was that many farmers were individual producers, whereas industrial production was more collective and productivity often depended not only on what one worker did but what other workers were doing at the same time.

Schultz and one of his students, Finis Welch, proposed that more educated farmers were better at adjusting to rapid changes in economic conditions and new economic opportunities, so earned more. This ability to adjust to change and to adapt to new ways of doing things, according to Schultz, is the result of skills acquired in school. Although these studies implied that such skills made workers more productive in jobs, the research was applied to individual agricultural entrepreneurs, not to workers in assembly-line factories. Even for these individual farmers, it was those with university education who did significantly better in the process of change. This seems to imply that for education to make workers more productive, they need to have some decision-making control over what they are doing. There is no reason to believe that workers who are in jobs that simply require responding to simple, direct orders would produce more if they were more educated.

At the same time, we know that jobs that do require making decisions are usually done by more educated individuals in the labor force. Other jobs require specific knowledge that is usually learned in school. Teachers, for example, or accountants, or even electronic technicians usually require some mathematics and reading and writing skills that are readily learned in a school setting.

That is why we observe most of the effects of schooling on productivity across jobs rather than in the same kind of job. We also observe greater effects of schooling on earnings between jobs that require more decision-making and jobs that require less decision-making rather than across factory sales jobs in the same industry.

2.4 Education and Productivity in the Information Age

With the shift to an information economy, new, flexible organizations of production, and globalization, economists have taken these arguments about human capital in the production process much farther. The claim that educated workers adjust more effectively to rapid change in opportunities and technology implies that in today's more rapidly changing and more competitive markets, the payoff to education should rise. The growth of science-based industries—chemicals, biotechnology, telecommunications, information systems—also means that economic development depends increasingly on highly educated and scientifically trained labor. Yet, more than simply increasing the demand for scientifically-trained labor, economists argue that the

new types of production reward innovation and learning-by doing on a broader scale, even among non-scientifically-oriented workers.

In this kind of model, more education in the labor force increases output in two ways:

- Education adds skills to labor, increasing the capacity of labor to produce more output;

- Education increases the worker's capacity to innovate (learn new ways of using existing technology and creating new technology) in ways that increase his or her own productivity and the productivity of other workers.

This model sees innovation and learning-by-doing as *endogenous* to the production process itself. It assumes that productivity increases are a self-generating process inside firms and economies. Such learning-by-doing and innovation as part of the work process are facilitated in firms and societies that foster greater participation and decision-making by workers, since those are the firms and societies in which more educated workers will have the greatest opportunities to express their creative capacity.

Thus, the model of endogenous innovation and learning-by-doing has major implications for the economic value of education. The value of higher educated labor, particular highly skilled scientific and management labor—those who are able to create the most valuable innovation—increases relative to other levels and kinds of educated labor. More important, the economic value of education is generated by a much more complex set of relations between the potential of human capacity to produce more economic output and its realization through organizations of work that are both geared to realize that capacity and to innovate using their human capacity. Thus, the value of education is not just a function of the jobs that workers with more education can get in the labor market. Instead, information, ideology, political power, property rights, citizenship rights in the workplace, and the willingness of organizations to innovate all condition the economic value of education.

Activities for Section 2.

Why do you think that human capital theory developed when it did? If you were an educational policy maker in, say, California, how would you justify spending more money on education in arguing with the Governor?

Which levels of education does investment seem the most simple to justify using human capital theory? Using endogenous growth theory?

If you were to advise the Ministry of Finance of a developing country to invest in education, would you advise them to do any other kind of public investment at the same time? Why?

3. The Role of the State in Producing Education

The state is the collection of political institutions that are responsible for governing societies and providing the legal framework, collective defense, and social services that help those societies' network of economic and social institutions to function effectively.

It is not difficult to imagine that the state would be responsible for a system of justice that develops and enforces laws. Those laws are crucial to citizens entering into contracts and engaging in a whole range of activities. A system of justice reasonably free of corruption and reasonably fair to all members of a society makes an enormous difference in economic efficiency.

It is also not difficult to imagine that a state would be responsible for the common defense. The era of individual families and clans taking responsibility for self-defense are long gone. We expect the state to develop the capability to defend the nation against outside threats, including intelligence agencies, and an organized military. We also expect the state to be responsible for internal security, protecting us from domestic threats such as terrorists and criminals.

However, should the state be responsible for educating its citizens? An important economic argument for doing so is that individuals have a difficult time borrowing money to pay for schooling privately because it is generally unlawful for borrowers to pledge their future labor as collateral against the loan. Those families will little physical capital would not be able to borrow for education if it were completely privately financed and privately run. Under such circumstances, there would be significant *underinvestment* in education. Many children with the capacity to do well in school, would not take education no matter how brilliant they were because their families could not afford it.

In addition, the state may have other reasons for investing in the education of its citizens. Individuals taking education would realize gains from those years of schooling in the form of higher income. If the gains were high enough and individuals could borrow sufficient capital to attend school, they would do so, even if schooling were totally privatized. However, it is possible that more educated labor increases the productivity of other workers who are not as educated. These extra gains to the economic well-being of the work force are called "externalities." If such externalities exist, the state should subsidize educational invest because this would induce individuals to take more education, hence benefiting the entire work force.

A good example of these possible externalities is the effect that a good agricultural university such as La Molina, in Lima, Peru, has had on the development of the new, export agriculture in Peru over the past twenty years. Engineers from La Molina have done very well in the new agricultural industry, but they have created very large externalities by generating a whole host of innovations that have been adopted by other farmers, and increased their productivity.

Another example of externalities is the effect that increased schooling of the low-income population may have on crime reduction. A famous experiment in Michigan provided a sample of very low-income black children with high quality pre-schooling.

Compared to the control group, those who received the pre-schooling were more likely to finish high school, and a much lower percentage ended up in prison. Reduced crime and incarceration is apparently an important "externality" of public investment in pre-school, since both these effects benefit the population as a whole, not just those who attended pre-school.

A third reason economists have given (beginning with Adam Smith) for the state to subsidize educational investment is that it may desire to socialize pupils into becoming "good" citizens with common national or regional values. This integrative function of schooling creates a sense of collective goals, with the most obvious purpose one of mobilizing effort for national causes, often (unfortunately) to make war on other nations. But public subsidies for schooling may also serve collective environmental goals or the reduction of social class distance or the teaching of greater tolerance, all of which are laudable reasons to invest public funds in subsidizing schooling.

3.1 The Production of Schooling

Since the state is responsible for the financing of education in almost every country of the world, and in most places also manages the school system, education worldwide is mainly characterized as a large industry with many small branch plants. Economics of education quickly incorporated the production of education into its orbit of interest. Economists used "production functions" to model how various inputs into the schooling process influenced the amount of output, usually measured by student achievement and attainment.

In Module 3, we will discuss in detail how economists model school production. We will also discuss many of the interesting issues economists deal with in trying show why some schools are more "successful" and others less so. The most important point to remember for now, however, is that schools are not typical firms, and schooling is not a typical production process. Many economists have argued that this is so because the state "monopolizes" the delivery of schooling, the teachers unions constitute a barrier to effective and efficient schooling, and that schooling therefore costs too much for what you get. But private schools are remarkably similar to public schools, even if private schools are not unionized and even if they operate in a highly competitive market. If anything, the only way that private schools are more "efficient" than public is that private schools often get to pick their students, whereas public schools usually have to take the students who live in the area served by the school, no matter who those students (and their parents are).

One reason that schooling is such an unusual production process, whether privately or publicly managed, is that the teaching-learning process in schooling depends so heavily on relations between the people doing the producing. Learning is a product of interactions, and the quality of interactions is crucial to learning. There is no explicit wage contract between students and teachers that defines what school is bound to produce. Furthermore, teachers are virtually unsupervised in their production activities, and a major part of the production of education takes place jointly outside the school in

other institutions, such as the family and the community, that are even less structured like an assembly plant than schools. Yet the public sector and many private schools attempt to make teaching and learning an assembly line factory process, and economists analyze that process as if teaching and learning were guided by the rules of a hierarchical factory production system.

That does not mean that there are no elements of assembly-line production in schooling and learning. Repetition does work to produce learning. Economists are only just beginning to understand what goes on in the process of formal education, and they are trying to come to terms with the reality and complexity of that process.

To capture the relationship between schooling and families' behavior toward children and toward children's school learning requires understanding what may be called "joint production." Researchers have shown, for example, that when families can and do provide good nutrition and health care to their children and spend more time talking with them and paying attention to them in positive ways at an early age, this makes them inherently much better learners. Later, when children go to school, their family's participation also affects learning in school.

Capturing the complexity of this process also means doing a better job of understanding the organizational relationships in the family and in school as they pertain to pupils' learning. Just as in the case of flexible production in private, for-profit firms, participation in decision-making and innovation by teachers and parents (and students) is almost certainly a crucial factor in the productivity of the teaching-learning process.

If the effect of family is so great on learning, how important is the school production process to learning, and what are the more important factors in explaining "good" and "bad" schooling? How do we know what factors affects student achievement and how far students are likely to go in school? Module 3 will focus on these issues. Here is a clue: we know from many years of empirical research that a student's family life—his or her "cultural capital," as Pierre Bourdieu and Jean-Claude Passeron called it—is very important in determining where a student starts out in school. That should be fairly obvious. Yet, we also know that the student's relative achievement position compared to other students does not change much, on average while attending school, at least during primary school. So academic performance differences between low-income and high-income students is almost the same at the end of a school year as it was at the beginning to the school year. Thus, schools don't seem to make things worse, but they don't make things better for the slow starters either.

Here is a second clue: some students do make greater gains while in school, and the main reason for it is that those who improve had a more effective teacher. Other than family, teachers are the most important factor in determining how much students learn in school. The trouble is that economists are not sure what the most important traits are of teachers than make them more "effective." Are teachers with more education better teachers than those with less education? Are teachers that scored higher on their

university entrance exams better teachers? Do the best teachers in a region end up teaching the best students?

We spend all of Module 4 discussing the role of teachers in school production.

3.2 The Role of State-generated Social Capital

Almost all the discussion in the economics of education is about human capital. However, economists of education are becoming increasingly aware that the formation of human capital may depend greatly on social relations in the family, community, and the nation as a whole. These social relations in the family and in community have been characterized as "social capital."

Coleman defines social capital as: "…not a single entity but a variety of different entities, with two elements in common: they all consist of some aspect of social structures, and they facilitate certain actions of actors—whether persons or corporate actors—within the structure…social capital inheres in the structure of relations between and among actors. It is not lodged either in the actors themselves or in the physical implements of production."[1] In applying this concept to the creation of human capital in the next generation, he argues that family background is "analytically separable into at least three different components: financial capital, human capital, and social capital," where social capital is the "relations between children and parents (and when families include other members, relationships with them as well)."[2] According to Coleman, even if a family has a high level of human capital (parents' education), the child my not get its full benefits if it is not complemented by the family's time and effort to increase children's school achievement and attainment (family social capital).

Coleman also discusses social capital outside the family, namely in the social relations that parents have with other adults in the community and in the relations they have with social institutions. For example, families that move often would, in this conception, have less social capital outside the family than those staying put.

Harvard political scientist Robert Putnam discusses social capital more in terms of voluntary associations. Voluntary associations of parents generate social capital by helping to solve community social problems, creating trust, and developing and enforcing social norms for adults and children.[3] This gives social capital its character of a public good. Neither Coleman nor Putnam discuss peer effects directly, but peer relations also constitute social capital (with both positive and negative implications for academic achievement and attainment).

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[1] Coleman, 1988, p. S98.
[2] Ibid, p. S110.
[3] See also Robert D. Putnam, *Making Democracy Work : Civic Traditions in Modern Italy* (Princeton, N.J. : Princeton University Press, 1993); Robert D. Putnam, *Bowling Alone : the Collapse and Revival of American Community* (New York : Simon & Schuster, 2000).

The concept of social capital is "one way of introducing social structure into the rational action paradigm."[4]It suggests that in neighborhoods, regions, and even countries, networks (information channels), social organizational factors contribute to greater collective productivity in a range of activities, These factors include smoothly functioning and equitable legal systems, trust, the passing of culture from one generation to another, social norms, and civic cooperation. The contribution goes beyond what an individual's and his/her family human capital characteristics would predict.

Coleman uses the concept of social capital to describe relations in the family and among adults in the community as an important factor explaining educational outcomes. His concept can be extended to include *state-generated social capital* that influences educational production, and, by implication, also extends beyond comparing families and communities within nation states to comparing social capital and its effects across nation-states. We suggest that children of a given (particularly lower) social class background attending schools in neighborhoods, regions, and countries that have more socially integrated, safe, cooperative, and coherent social climates do better academically than children attending equally-academically resourced schools in a less favorable social context.

Most of the social capital discussion focuses on individual or family behavior that creates social structures that produce more favorable results, or on cooperative institutions in democratic states where individuals *voluntarily* adhere to organizations that promote networks of (democratic) institutions that in turn create the externalities identified with social capital. However, a democratic or even an authoritarian state can also create social capital. Authoritarian states face difficulties in doing so, but can be successful in societies more likely to tolerate authoritarian governance as long as they deliver improved material and social conditions. Capitalist/corporatist states in Korea, Taiwan, and Singapore, for example, were/are long governed by authoritarian regimes committed to broad collective improvement that focused on creating a social context for high economic growth (greater material consumption), high academic achievement, and considerable social mobility.

Authoritarian regimes in socialist countries also have tried to produce social capital. The states in revolutionary Russia, China, Vietnam, and Cuba, for example attempted to generate new social and political structures through collectivizing wealth. These socialist states called on the suppression of individuality for the greater social good, defined by freedom from capitalist exploitation, increases in production, and improved social services. Yet, socialist states have not been as successful as capitalist societies in linking social capital to individual and collective economic productivity. Contrary to Marxian theory, state socialism is not as good at capitalist accumulation as market capitalism despite a social ideology of individual sacrifice for collective output. China and Vietnam have recently achieved high rates of economic growth, but only by allowing capitalist markets and relations of production to emerge alongside state enterprises. Socialist values are either not as complementary as individual competition to

[4] Coleman, 1988, p. S95.

higher individual productivity, or state run production is so inefficient that even the presence of socialist values cannot overcome those inefficiencies.

When it comes to developing high quality mass education, generalized health care, and other social services, however, socialist states have been *more* successful than capitalist states. Basic and secondary education in these authoritarian socialist states is as good as it is because the state invests relatively more in schooling and because of socialist social capital. The state puts great emphasis on equality and the reduction of social class differentiation. It guarantees for the health and safety of children, including the elimination of child labor, families' trust in the state's ability to produce high quality education for all, and the development of a youth culture (social norms) even in lower SES groups that places relatively higher value on academic success. Socialist values seem to complement the delivery of mass education and other social services better than the individuality and individual competition extolled by democratic capitalist societies. At the same time, an authoritarian state committed to high quality education can enforce the contextual conditions to produce it rather than relying on family generated social capital or the indirect regulation of individuals' choices.

This raises the important question whether democratic capitalist societies that are highly regulative and stress socialist or communal values, such as the Scandinavian countries, have higher quality education because of the relative social equality and emphasis on collective responsibility that characterizes them (see, for example, .Manuel Castells and Pekka Himanen, *The Information Society and the Welfare State : the Finnish Model* (Oxford : Oxford University Press, 2002). The voters in those societies have voluntarily opted for a highly regulated social context. The OECD seems to take the position that greater equality in educational provision is an important explainer of higher performance on the PISA test (OECD, 2003). There is evidence that schooling in mini-state socialist conditions, such as those represented by military bases in the United States, seems to be much more effective for minority students than schools in civilian U.S. society (Claire Smrekar, James Guthrie, Debra Owens, and Pearl Sims, *March Toward Excellence: School Success and achievement in Department of Defense Schools.* Nashville, TN: Peabody Center for Educational Policy, Vanderbilt University, 2001).

Activities for Section 3:

1. Research the concept of social capital. What can you find out about this concept? Do different writers define it differently? Which of the definitions makes most sense to you?

2. Can you define the difference between Pierre Bourdieu and Jean-Claude Passeron's notion of "cultural capital" and the concept of social capital?

4. The Main Educational Issues in a Global Economy in the Information Age

4,1 The nature of changing labor markets that affect the demand for different levels of education.

The market for labor is changing rapidly worldwide. Since the 1980s, earnings of university graduates have been rising compared to the earnings of workers with less education. Although economists argue about the reasons for the change, at least part of it is probably due to the expansion of information-based and science-based industry and services, and the more global aspects of markets. This has had the effect of raising demand for more highly educated labor, particularly in the developed countries. Much of simpler manufacturing has shifted to developing countries, but even in those countries, global competition demands more sophisticated manufacturing and marketing techniques, increasing demand for more highly educated labor there as well.

Increased demand for higher skills in the labor market increases the pressure on countries and regions to expand higher levels of education. In the developed countries, this means increased enrollment in universities and, as a result, many new kinds of post-secondary institutions and the search for new forms of financing.

Another major change in world labor markets is that they are feminizing. In 1975, only xx percent of the labor force in Spain was women. In 2005, a short thirty years later, the proportion has climbed to xx percent. This is partly a result of increased global competition in product and service markets, and partly a result of the rapid growth in developed and many developing country economies of knowledge based services. Employers have hired women into many professional service jobs that were previously exclusively male. The feminization of labor forces has had two important effects: it has eliminated the male monopoly over a range of professional jobs, reducing the growth of male wages in those jobs; and it has gradually increased the relative wages of women, particularly of higher educated women. This, in turn, has increased the payoff for women to investing in higher education.

How do economists evaluate these changes and estimate the degree and kinds of pressures that higher education institutions may face as a result? In Module 2 we show how the human capital model provides one important way of making such estimates, and in Module 5, we show how economics of education can help choose alternative ways to finance the expansion of education to meet such pressures.

4,2 The role of the public sector (the state) and decentralization in the production of education

Economic globalization has been associated with neo-liberal approaches to reducing the role of the state in providing public services. Part of this movement results from real pressures on the state to remove regulations on private sector companies and reduce bureaucratic impediments to companies in each country to become more competitive in global markets. However, part of the movement is simply ideological. This is the case in education, where neo-liberal policies have focused on decentralization

and privatization of education in the name of greater consumer choice and greater efficiency in producing educational services.

There are some good arguments for local control of schools and more parent involvement and democratic participation in school decision-making. There are also good arguments for increasing parents' choice in the schools for their children. This may include privately run schools subsidized by government funding. Yet, there is little ot no evidence that choice, local control, or greater parent participation in running schools produces better academic results. Neither is there any consistent evidence that decentralizing education or marketizing education by subsidizing private competitors to public schools improves student achievement or overall educational attainment.

"De-regulating" schools would seem to be a positive reform, consistent with increasing competition, stimulating innovation, and increasing flexibility in education, all associated with the main advantages of globalization. It also may be a sensible response to the possibly declining power of the state in the face of globalized markets and new efforts to increase the influence of trans-statal organizations such as the European Union. But as discussed above, state-driven social capital may be crucial for a school system to produce academic results efficiently. Thus, increased state involvement in and regulation of education through a socially efficient bureaucracy may be a far wiser policy direction to take—particularly to improve the value of schooling for low-income students.

The "proper" role of the public sector in education is a fundamental and long-time discussion in the economics of education. We review it in Module 3 and again in Module 5.

4.3 The changing role of different levels of education.

As educational systems have expanded under pressure from rising payoffs to higher levels of schooling, the nature of each level of schooling has changed. Before this recent expansion, university education was the reserve of a relatively elite group. Secondary education played a double role of selecting this elite group while preparing those who did not go to university for industrial and technical jobs. With the general expansion of higher education, secondary education has become more universal. As secondary education becomes universal, it also tends to become a level of post-secondary preparation for everyone, much more like a primary school prepares students for secondary school. Although secondary school is still the end point for many students, it gradually is considered a level of education that that all students are expected to complete and continue on to further education, either to post-secondary technical training or to university.

The organization of secondary education should change drastically under such circumstances, but, like many organizations caught up in globalization, it often does not. Institutions such as schools do not adapt easily to changing conditions, because it is often not apparent to teachers and school directors, to bureaucrats in the Ministry, or even to parents (who attended school in a previous generation), that these conditions have

changed. In terms of economic thinking, consumers/investors (students and their families) are often making their consumption or investment decisions about schooling based on information that is not relevant to the new conditions in the labor market.

4.4 The changing labor market for teachers, particularly women teachers

In most countries of the world, a high percentage of schoolteachers are women. This is especially true for primary school teachers. One reason so many teachers are women is that schooling (especially primary schooling) was viewed as an extension of child upbringing, traditionally associated with female work. Another reason is that women have earn lower wages than men. By hiring women to teach school, the state was and is able to supply schooling for less than if the state hired primarily men to teach school. For most women, teaching school was for many years one of the few professions that they could practice and earn a decent wage.

However, feminization of labor markets and the increasing relative wages of women in most types of work, especially in professional jobs, have had an important impact on education. As salaries have risen in competing private sector jobs, governments have had to raise teacher salaries to convince women with university credentials to enter the teaching profession. The costs of education in most countries have risen rapidly, mainly because of the feminization of labor markets. True, the supply of highly educated women is increasing rapidly, but demand for these highly educated women is increasing even more rapidly.

In Module 5, we examine how economists analyze teacher labor markets, including how teachers are distributed (or distribute themselves) among schools catering to different social class groups, teacher recruitment and turnover, and the possible impact of teacher incentive schemes.

4.5 Possible new roles for educational technology?

Globalization is intimately associated with information and communication technology. The advent of the Internet has globalized information in real time for mass use. Many view such interactive access to information as having vast potential for education. They see computers, with their ability to process information quickly in an interactive fashion, as part of a cure for poor education. If globalization is to have any direct impact in the classroom, computers and the Internet would surely be part of that educational change.

Yet, the history of technology in schools. beyond simple aids, such as blackboards and overhead projectors, suggests that fancier equipment, such as television and computers, have a difficult time impacting teaching and learning to the extent their advocates (Cuban, 1992). And despite a vast literature promoting more expensive and complex technology, there is little evidence that they are cost-effective in improving student performance in a school setting (Carnoy and Levin, 1976; Levin, Glass, and Meister, 1986). There is yet less evidence that computers, even when available in

classrooms, are widely implemented effectively to produce increased learning (Becker, 1999). Thus, globalization has increased the pressure to adopt computer technology for classroom use, but this is usually limited to installing machines and some software without the necessary immersion training, support systems and changes in teaching methods and curriculum required for total integration of this technology as a *learning system.*

Few doubt that technology can play an important role in education and training.. Computers introduce new ways to process and store information and impact the speed of communication among individuals at great distance. They also present alternative systems for learning. Drill and practice programs, tutorial programs, a host of commercially available learning games, LOGO, and computer simulations and animations used to explain scientific principals, and even word processing, with its built-in spell check and thesaurus programs, can all be shown effective in improving student learning. The advent of the Internet provides another popular form of data gathering for research and access to a wealth of information. So the possibilities seem great for computers as a new tool for learning.

Educational technology advocates tend to emphasize technology's effects on learning. Economists of education, however, are as concerned with the *costs of producing these effects*. Economists want to know how improvements in learning attributable to, say, internet-based instruction relative to the added cost compare to other interventions compared to their costs. Computers themselves are no longer especially expensive. But by the time other fixed costs, such as rewiring, peripherals, and initial software, are included, a computer package for a school that allows students adequate time during the week to use it (approximately one computer per five or six students), could initially cost a school with 400 students about $100,000-$150,000, or about $300 per student. This includes neither teacher training to make all teachers in the school familiar enough with computer technology to integrate computer use into their teaching, nor the variable costs associated with computers, such as a full-time computer teacher, computer maintenance, and annual spending on software. In the U.S., these costs represent a high percentage of the total (Levin, Glass, and Meister, 1986). In developing countries, where computer specialists, maintenance personnel, and educational software in local languages are relatively expensive, omitting their cost seriously underestimates the total expense for an effective computer education add-on in a school. As important, the potential of computers to develop higher order cognitive skills requires the kind of teachers who know how to develop those skills in pupils without the use of computers, and these are precisely the teachers that are relatively scarce in most countries.

No wonder, then, that in almost all primary schools that have computers, the technology is largely symbolic. The costs of going beyond symbolism are high. At best, therefore, the main effect is to familiarize students with the technology itself. Indeed, that is what most parents expect from putting computers in schools.

A more important use of educational technology is for distance learning; that is, in *extending* schooling to more difficult-to-reach communities or post-school, working

populations through distance learning or in training young people and established workers in specific skills, including much sought-after computer skills Again, economists of education are not only concerned with the learning outcomes of using computers for distance learning, but the costs of producing these outcomes. Economists ask: What does it cost to produce the same outcomes through distance education using web-based curricula as through conventional classroom education?

Activities for Section 4.

1. Do you think that teachers' work in the classroom has changed because of globalization? What are some of the factors that may be changing in Spanish classrooms in the past 15 years?

2. If you were to design a study to compare the cost-effectiveness of taking courses in UOC compared to taking classroom-based courses in the University of Barcelona, what costs would you include in each case? How would you measure outcomes?

Summary

This Module has defined the economics of education and the reasons it developed so quickly in the post-World War II era of competing models of economic development and the political competition of the Cold War. The Module also reviewed some of the major changes that have occurred in the economics of education since the 1960s. These changes reflect the evolution of economists' thinking about education, but they also reflect major changes in the organization of production in developed countries. In the latest stage of these changes, the world economy has become *globalized*. With globalization and increased international competition have come important new pressures on the educational systems of almost every nation.

At the same time, the role of the national state, crucial for shaping educational systems, is also in the process of transformation. The Module suggests that one way of assessing the new role of the state is by adding the concept of social capital to the concept of human capital. In terms of the changing role of the state, the Module also introduces the concepts of educational production and the changing labor market for (women) teachers. Educational production and teacher labor markets are the subjects of Modules 3 and 4.