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January 2013

Online at <https://mpa.ub.uni-muenchen.de/63690/>

MPRA Paper No. 63690, posted 19 April 2015 14:37 UTC

Human Capital Investment through Education and Training: an Overview

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ABSTRACT: *We present in this paper the real importance and very contemporary human capital investment. Through a quantitative analysis, we present the level of human capital accumulation that countries are able to achieve. We also examine the significant part occupied by educational expenditure in the state budget of the some countries.*

The objective would be to estimate the value of human capital and emphasize how human capital influences various areas of everyday life of individuals. This implies that this notion is now at the heart of public policies in different countries. Public choices are directed in particular towards improving the education and training of people throughout the life cycle. Similarly, in the perspective of enlargement of human capital to a broader concept of intangible capital, we will try to see if there is a complementary relationship between human capital and cultural capital.

Keywords: *Human Capital, education, Training, Globalization, Cultural Capital.*

I. INTRODUCTION

Many economists, such as A. Smith, I. Fisher, A. Marshall, F. Knights¹, used the concept of human capital and recognized that human beings as a part of the wealth of societies.

That venture capital, said investments. With this new concept of human capital, opens a wide range of investments around the major themes of education and training.

Investment in human capital is the total expenditure incurred in this regard. These costs are estimated in two steps: direct costs and opportunity costs.

II. THE INTEREST AND THE STRATEGIC ROLE OF HUMAN CAPITAL

II.1. Human capital is an accumulation of knowledge

People acquire knowledge through general training, that is to say, education. As businesses, it conducts monetary investments such as the purchase of books, rights, etc; or non-monetary investments such as loss of time and they expect them to be recouped. This cost takes the form of a higher salary when entering the workforce. Indeed, the individual seeks to maximize spending on education and equalize their marginal cost with marginal productivity.

However, this salary is an expense for the company normally assessed according to the level of study of the employee. Indeed, an important part of knowledge for its use is specific to each company such as the use of special equipment. The company may also increase its human capital through training.

II.2. The intervention of human capital in the economy

The accumulation of knowledge is therefore through education and training. But not all individuals are equal before the possibility of acquiring knowledge. This implies a greater vulnerability of individuals facing unemployment if they hold a low human capital. So, there will be development of structural unemployment. This worsening of the employment situation, however, results in an increase in the rate of accumulation of human capital. Indeed, the unemployed individual will use a variety of training to overcome the shortcomings above.

In this context, human capital and unemployment have parallel developments since there is a stop of the progression of structural unemployment.

Some authors have tried to determine the impact of an increase in human capital on unemployment in the theory of endogenous growth. Indeed, an increase in unemployment destroys a part of human capital because it has the property to deteriorate when not used. A long period of unemployment decreases the efficiency and productivity of workers, so it weakened the growth rate of the economy.

¹ Fisher I., [1906], « The nature of capital Income », New-York, Macmillan; Marshall A., op. cit. p14.; Knight F., [1944], «Diminishing returns to investments », Journal of Political Economy.

Despite the importance of human capital, this concept is difficult to interpret. This is equivalent to a stock of knowledge valued and incorporated individuals and measured by the paid wage. Thus, we will show the different possible valuations of human capital.

Gu and Wong (2010) developed an estimated value of the human capital in Canada. They have compared it to the value of produced capital and natural capital.

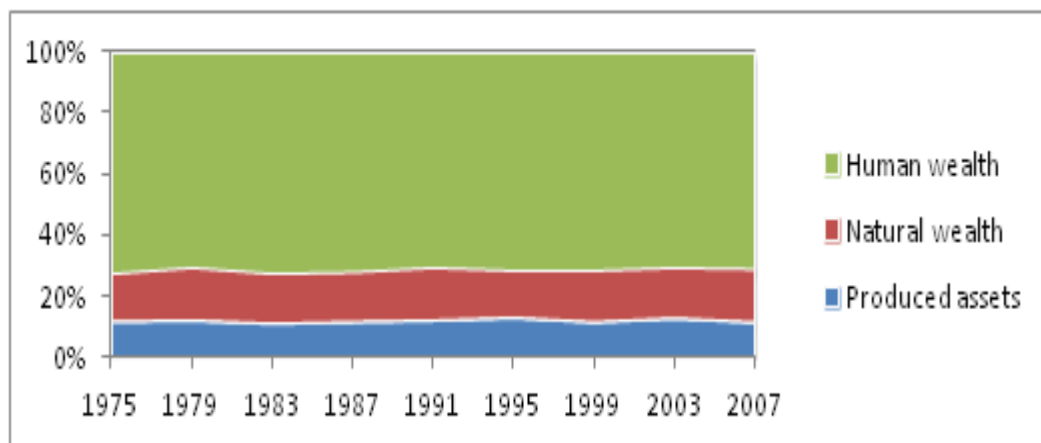


Fig 1. Distribution Of Total Wealth In Canada In 2010 (In Canadian Dollars)

The share of human wealth, produced capital and natural wealth is shown in Figure above. The main component of total wealth in Canada is human capital, followed by produced capital and natural capital. In 2007, human wealth represented 70% of total wealth, against 17% and 13%, respectively, produced capital and natural capital.

II.3. Different forms of private investment in human capital

The increase in the stock of human capital can take many forms. The best known is that of human capital for education (school and university), followed by the knowledge and skills acquired during life. Health care, migration and acquisition of information on the functioning of the economic system are also investments in human capital. Finally, family education, the knowledge and skills passed from parents to children can also increase the stock of human capital.

These different forms of investment involve uses of scarce resources. All lead to improved physical and intellectual capacities of individuals, that is to say an increase in productivity that will result on the labor market, changes in wages, off-market, by non-monetary returns.

We will classify all these forms of investments into three categories:

- Investment in knowledge;
- Migration;
- Investments in health.

Otherwise, investment in human capital can be measured by the amount of two types of resources devoted to training: money and time. These resources are invested by individuals, companies or governments.

Indicators constructed from data on education and training to assess the knowledge and skills acquired in the formal education process. Thus, these indicators are used to estimate the stock and investment in human capital. Education statistics are gathered primarily on an international basis by the OECD, UNESCO² and EUROSTAT³. In this context, the total expenditure on education as a percentage of GDP indicates the overall effort (from public and private sources) education in a country⁴.

This indicator can be explained by comparing the total expenditure per student brought in per capita GDP, which measures the average investment made in the training of a young relative to the ability of a country to pay for this investment.⁵

² [United Nations Educational, Scientific and Cultural Organization.](#)

³ . EUROSTAT : It is a branch of the European Commission responsible for statistical information at the community level.

⁴ These include expenses related to early learning in training in alternation.

Table 1. Public Expenditure On Education In Selected Countries 2006-2011 (% Of Gdp)

	2006	2007	2008	2009	2010	2011*
South Africa	5.29	5.27	5.08	5.44	5.44	5.52
Algeria	n.d	n.d	4.3	n.d	n.d	n.d
Germany	4.4	4.5	4.49	n.d	n.d	n.d
Saudi Arabia	6.22	6.40	5.62	5.48	5.17	4.87
USA	5.60	5.45	5.62*	5.71	5.80	n.d
Morocco	5.49	n.d	5.56	5.54	5.54	5.54
Niger	3.33	4.06	3.69	4.53	4.57	4.80
Switzerland	5.46	5.18	4.92*	4.66	4.39	n.d
Tunisia	7.1	7.1	6.9	6.94	6.88	n.d

It is noted that this indicator varies from one country to another, but overall there has been a steady increase. To correctly interpret these indicators, it is useful to consider the enrollment and demographic variables such as the percentage of the population in school age.

III. THE MASSIFICATION OF TEACHING ACTIVITIES

III.1. The impact of globalization

Globalization, major reality of twenty-first century, has already profoundly influenced the teaching.⁶ By globalization, we mean the reality determined by a global economy increasingly integrated new technologies information and communication technologies (ICT), the emergence of an international network of knowledge, as well as other forces beyond the control of schools.

III.2. The development of the phenomenon

The main changes occurred in recent decades is due in large part to measures taken in response to an overwhelming demand for education.

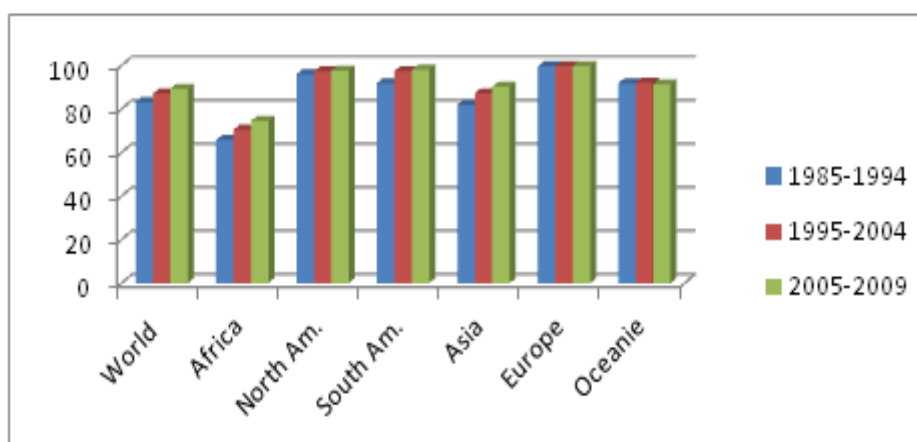


Fig 2. Youth Literacy Rate (15-24 Years) By Region In 2010

From the graph above, it appears that the rate of literacy among youth is increasing in all regions of the world. This increase is due to the advent of post-industrial economies, the growth of service industries and the emergence of a knowledge economy. The most remarkable progress concern the Europe and America and to a lesser extent, Asia. However, Africa has the lowest rates and has not yet reached the level of the world.

III.3. Primary education⁷

The number of children attending primary school has exploded over the past decade, largely due to the considerable resources and commitments of governments. The countries that have succeeded in expanding access to primary education are now facing greater demand for secondary education. The international

⁵ Public expenditure on education is the public current expenditure and capital in respect of education; it includes public spending on educational institutions (public and private) and administration of education.

⁶ Note that globalization is not a recent phenomenon, but it changes momentum in recent years.

⁷ The figures in this paragraph are taken from the "Global Education Digest 2011: Comparing Education Statistics Across the World," paragraph 1.1., UNESCO Institute for Statistics (UIS), 2011

community is increasingly focused on expanding access to two levels of education, while seeking to improve the quality of learning services provided.

In 2009, 702 million children were enrolled in primary education in the world, compared to 646 million in 1999. This significant improvement in access to primary education represents an increase of about 9% in the world and has been concentrated in specific areas: enrollment has increased from 59% in sub-Saharan Africa (66% for girls) 28% in South and West Asia, and 17% in the Arab States. In 2009, more than half the world's children in primary school were found in two regions: East Asia and the Pacific (27%) and South and West Asia (28%).

Table 2. Change Of Primary School Age And Adjusted Net Enrollment By Region In 2010

Région	Change of primary school age population	Change in enrollments in primary primaire	Adjusted net enrollment rate	
	1999-2009	1999-2009	1999	2009
	(%)	(%)	(%)	(%)
Arabe countries	5.4	17.3	77	86
Central and Eastern Europe	-17.2	-21.0	94	94
central Asia	-20.1	-19.9	94	93
East and pacific Asia	-15.6	-14.7	94	95
Latin America and Caribbean	0.8	-3.1	93	95
North America and Western Europe	-1.5	-2.5	97	96
South and West Asia	3.9	28.2	79	91
Sub-Saharan Africa	25.3	59.2	59	77
World	-0.3	8.6	84	90

This table shows how demographic changes can influence enrollment at the primary level of education. For example, in Central Asia, the school-age population decreased by 20% from 1999 to 2009, primary school enrollment has also dropped by 20%. For most regions, the increase in primary school enrollment has outpaced population growth over the decade. The UIS has developed the adjusted net enrollment ANER.⁸ A comparison of ANER1999 and 2009 indicates that there has been an increase in primary school enrollment for the target population.

III.4. Secondary Education⁹

Secondary education has become a growing concern and a major challenge for education policy makers around the world. It represents an important step in the system that connects the training to higher education. A growing number of countries aim of universal participation in secondary education. Currently, the lower secondary education is compulsory in 80% of the world, and the transition to secondary education must be ensured in these countries.

The UIS has developed the effective transition rates (TTE) to better reflect the actual rate of transition of students from primary to junior secondary education. This indicator can be used to inform policies aimed at reconciling imbalances between supply and demand for education. Transition rates are 95% or more in most countries in three regions: Central and Eastern Europe, Central Asia and North America and Western Europe.

Governments have made significant progress in expanding the capacity of secondary education systems in their countries. As a result, they are able to accommodate 531000000 students in 2009, compared to 196 million in 1970. Since 1970, the world has experienced substantial growth in secondary school enrollment as shown in the following figure.

⁸ This rate is a measure of the actual school attendance officer's primary school-age population. It reflects the percentage of the population enrolled in primary or secondary education.

⁹ The figures in this paragraph are taken from the "Global Education Digest 2011: Comparing Education Statistics Across the World," paragraph 1.2., UNESCO Institute for Statistics (UIS), 2011.

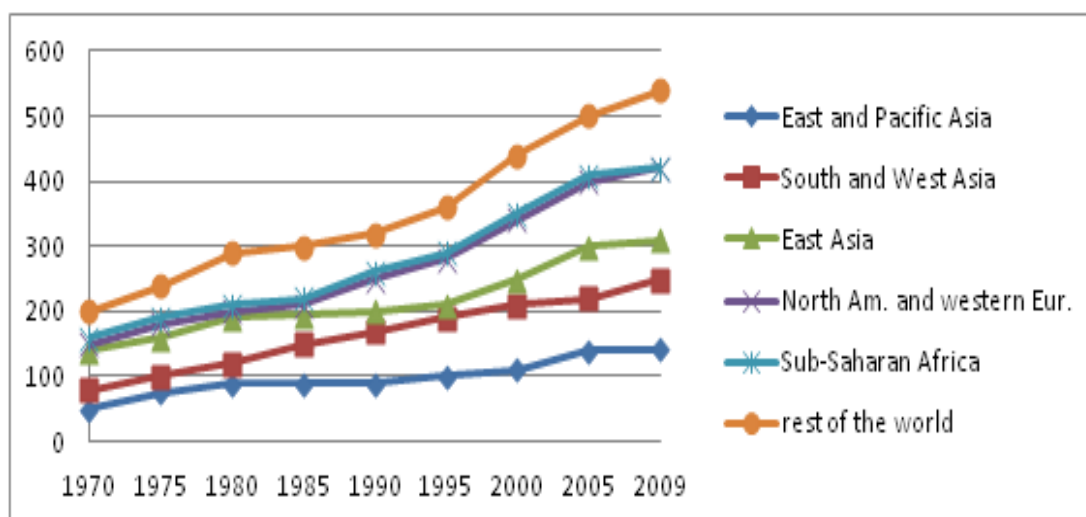


Fig 3. Enrolment In Secondary Education In 2010 By Region (In Millions)

Much of this growth occurred in regions that started with a low rate of participation in secondary education. For example, parts of North America and Western Europe and Asia and the Pacific had similar levels of enrollment in 1970, among 53-54 million school students. In 2009, Asia and the Pacific (163 million) had more than 100 million school students compared to North America and Western Europe (62 million). Overall, the gross enrollment ratio (GER) increased from 43% to 68% between 1970 and 2009¹⁰.

This means that enrollment in secondary schools represent 68% of the target of school-age population. However, the situation varies considerably between and within regions.

In the Arab States, the secondary school enrollment has increased from 4 million to nearly 30 million students between 1970 and 2009. The region has also seen a remarkable increase of the ratio of participation, with the GER increased from 22% to 68% over the same period. Total enrollment in secondary education in Central and Eastern Europe decreased by 37 million in 1970 to 31 million in 2009, following the downward trend of the school-age population, which fell from 44 million to 35 million during the same period. This has led to an increase in GER from 82% in 1970 to 88% in 2009.

For Asia and the Pacific, during the period 1990-2009, enrollment in secondary education has increased from 96 million to 163 million. On the other hand, the school-age population in the region, strongly influenced by the trend in the population of China, totaled 210 million in 2009, slightly less than the 214 million recorded in 1990. GER increased from 45% in 1990 to 78% in 2009 across Asia and the Pacific. At the national level, China, the most populous country in the region has doubled its education system capacity over this period. He was able to accommodate 100 million school students in 2009, compared to 52 million in 1991.

In the Latin America and the Caribbean, the secondary school enrollment has increased from 11 million to 60 million between 1970 and 2009. The secondary school enrollment has increased faster than the corresponding school age population. The gap between the two has narrowed from 29 million in 1970 to less than 7 million in 2009. As a result, the GER rose from 28% to 90%. During the period 1970-2009, the growth in enrollment in secondary education was modest in North America and Western Europe.

The total secondary level increased from 53 million to 62 million. On the other hand, the school-age population fell from 66 million to 62 million during the same period. As a result, the GER increased from 80% in 1970 to 100% in 2009, the participation rate highest among all regions

III.5. Higher Education ¹¹

¹⁰ The gross enrollment ratio (GER) provides a measure of the ability of education systems. It is the ratio of total enrollment, regardless of age, to the target population. GER greater than 100% indicates that the national system can accommodate all of its school-age children at a given level of education. Lower values may reflect a shortage of supply, as well as the impact of other factors, such as direct and indirect costs of schooling, which may limit enrollment.

¹¹ Altbach P. G. et al., [2009], « Évolutions de l'enseignement supérieur au niveau mondial : Vers une révolution du monde universitaire », Scoping Report for the UNESCO World Conference on Higher Education 2009.

Higher education is marked by transformations of scale and unprecedented diversity. It is not easy to understand from within a dynamic process that continues today.

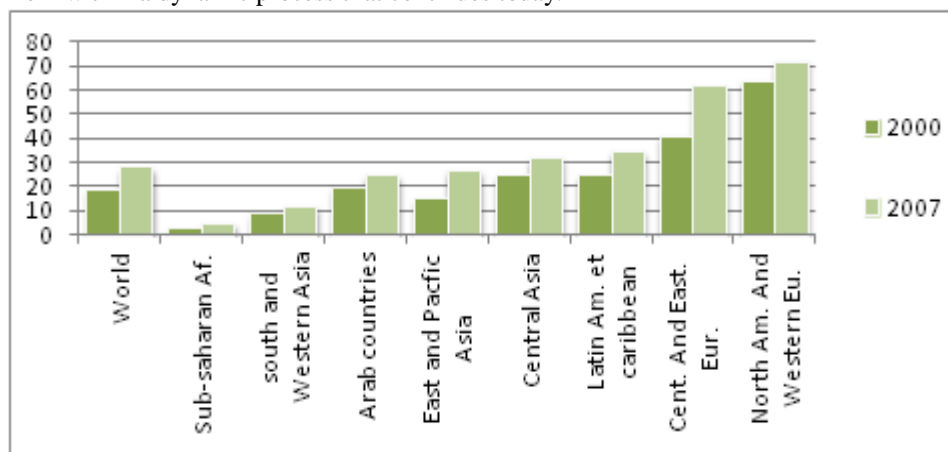


Fig 4. Gross Enrollment In Higher Education By Region In 2000 And 2007

In all regions, the GER in higher education has been a remarkable growth between 2000 and 2007, especially in Central and Eastern Europe from 41% to 62%. This rate is only 5% in sub-Saharan Africa in 2007. Otherwise, one of the most visible aspects of globalization is student mobility. The flow of international students is the result of institutional and national strategies, but it is also the result of the decision of the students themselves. More than 2.5 million people are studying outside their home country. According to some estimation, this number is expected to reach seven million in 2020.

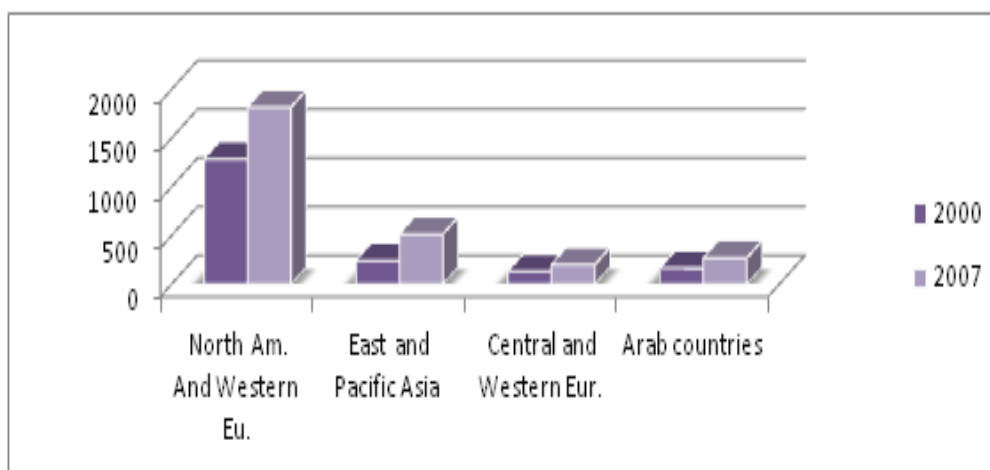


Fig 5. Number Of Mobile Students Worldwide By Region Of Destination Between 2000 And 2007 (In Thousands)

International mobility of students has two main trends. On the one hand, students from Asia include large higher education systems in North America, Western Europe and Australia. Countries like the United Kingdom, Australia and Canada have adapted their regulations on visas and immigration to attract foreign students, driven largely by the desire to maintain economic competitiveness and financial gain hosting a large number of students fulfilling the full registration fee. On the other hand, there is student mobility within the European Union, which is encouraged by many different programs. At the global level, international student mobility is primarily a South-North phenomenon.

Universities and higher education systems themselves have developed many strategies to take advantage of the new global context and to attract non-resident students. Some universities in non-English speaking countries have set up university studies in English to attract foreign students.

IV. THE MASSIFICATION OF TRAINING

IV.1. Creating large vocational training

Youth and adults are increasingly aware that professional skills are a must for anyone who wants to participate in the world of work. For governments, public education and training are essential to the development of economic competitiveness and promoting social inclusion, the fight against poverty and sustainable development. The education must follow market trends; provide learners with the basic skills and also assistance in personal and social development.

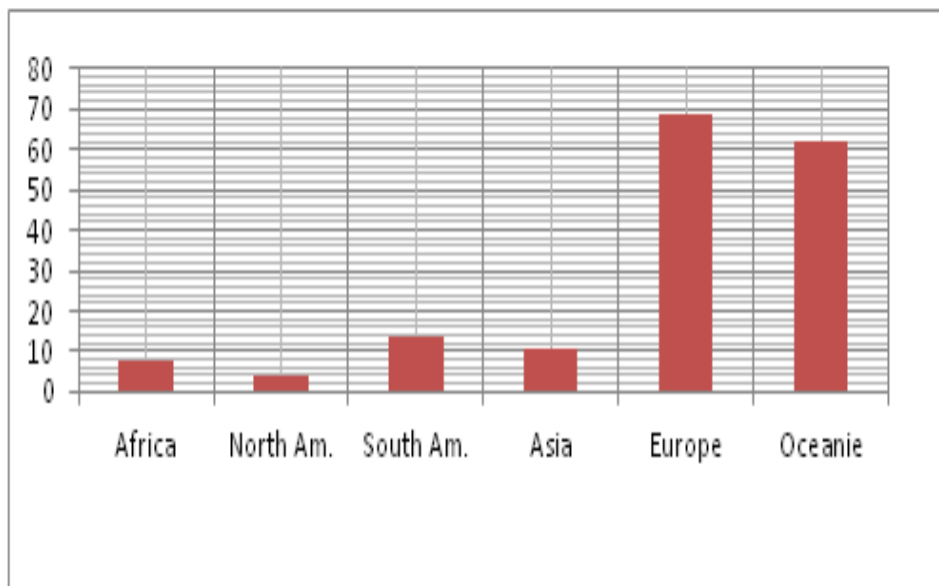


Fig 6. Regional Averages of Gross Enrollment In Education Professional At Cite 3 In 2005

According to this graph, we see that Europe is the region with the higher gross enrollment rate in vocational education (almost 69%). Other regions have lower rates especially in North America and Africa (sequentially 8% and 4%).

IV.2. Training in enterprises

Employers are increasingly focused on the need for "soft" skills such as communication, negotiation and teamwork, in addition to technical knowledge and skills.

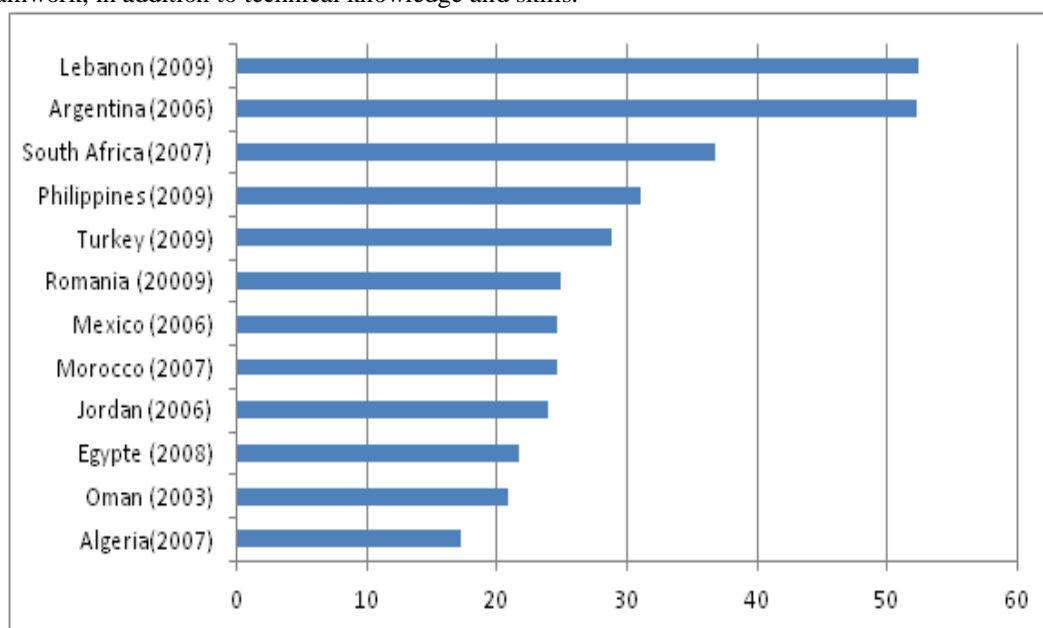


Fig 7. Percentage Of Companies Offering Training In Some Countries

Indeed, the change in technology and work organization requires the presence of workers with multiple skills and an ability to adapt quickly through continuous learning, which has led to the demand for broader forms of vocational training initial lay the foundation for more advanced learning.

We note from the previous graph that the percentage of firms offering training in countries like South Africa and Lebanon exceeds 50%. In countries such as Oman and Jordan, this rate is only 25%.

Table 3. The Extent Of Access To Vocational Training For Some Oecd Countries, By Criterion (D= Expenses / Payroll, H =Average Hourly Volume, Pr= Participation Rate), And By Year (1999 / 2005)

	1999 D/H/TP	D 1999→2005	H 1999→2005	PR 1999→2005
United Kingdom	1/23/4	1→16	23→25	4→11
Danemark	2/3/2	2→1	3→9	2→9
Sweden	3/17/1	3→4	17→3	1→5
France	5/11/6	5→2	11→14	6→5
Italy	12/16/15	12→18	16 → 20	15→16
Portugal	19/8/18	19→21	8→17	18→17
Greece	22/6/20	22→25	6→20	20→25

It is clear that all criteria for access to vocational training increased from one period to another. In Italy, the average amount of time devoted to training set of 20 hours in 2005, which was 16 hours in 1999. The participation rate in this country is about 16% in 2005. Similarly, salary costs have increased. This finding is also observed in other countries such as France, the UK and other OECD countries. Thus, we conclude that the place training strategies in developing countries is important, which explains the high level of human capital of employees in these countries.

V. THE DECLINE IN DEMAND FOR UNSKILLED LABOR

V.1. Stylized facts

➤ *Slowdown of overall productivity for unskilled labor*

The salary range has expanded considerably since the early eighties. The most common indicator used to measure this dispersion is the logarithm of wage differentials.

This movement of dispersion affects all social and demographic groups. Indeed, we found that:

- The premium education enjoyed "college graduates" in relation to "high school graduates" has increased in the eighties;
- The enlargement of the range of salaries by skill level was accompanied by a decrease in the purchasing power of less skilled workers;
- This improvement in the relative wage of skilled workers is associated with an improvement in the relative wage of more experienced workers;
- The enlargement of the range of salaries between qualifications is accompanied by effect of increasing wage dispersion within each qualification.

➤ *Deterioration of the relative position of less skilled workers*

One might expect that countries that have not experienced significant variation in relative wages in return suffer high unemployment among low-skilled segments of the labor force. At first glance, the unemployment rate of unskilled workers is even lower than the labor market is flexible.

V.2. Why the relative position of less skilled workers tend to degrade?

Three types of approach can account for the deterioration of the relative position of less skilled workers. One approach focuses on the role of major macroeconomic shocks. A second approach emphasizes the relative importance of supply of labor (rate of improvement of qualification of the labor force, immigration, etc) and labor demand ("biased" technical change, international competition, etc.). A third approach emphasizes the role of institutions on the labor market and, in particular, the ability of unions to appropriate some of the rents and compress the wage.

Whatever the approach, the mechanisms to link changes in the economic environment in the deformation of the structure of wages and unemployment is complex. It should lead to distinguish two sources of bias: a general bias affecting all industries, and differentiated technical change branches. The decline in the relative demand for unskilled labor: international trade, or biased technical change?

The chart below shows the balance on the labor market. Relative wages (w_s-w_u) provides a balance between the demand for labor (AD) and labor supply (AS*). In the case where relative wages are flexible, the supply curve (AS*) is vertical. Wages adjust fully ($w_u^*-w_s^*$) to ensure full employment of unskilled labor $l_u-\bar{l}_u$. Consideration of any deterioration of wages of unskilled workers is raising unemployment. Apart from this shift, the analysis conducted with full adjustment of wages remains relevant and findings are maintained.

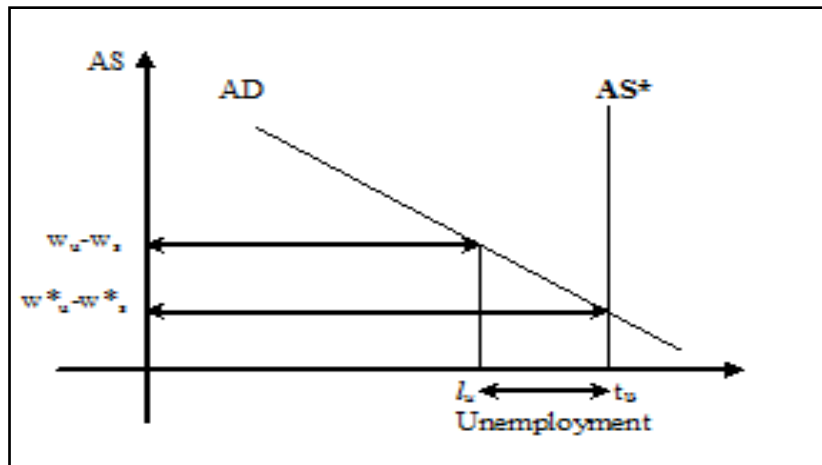


Fig 8. The Labor Market Equilibrium

The following graph illustrates the response of the economy during an impact of technical progress. Shows the case where the bias of technical change results in a decrease in the relative demand for unskilled labor.

The comparison between the response of a flexible economy (curve AS*) and a more rigid illustrates what has been said above wage rigidities limit the effects on wages $\Delta(w_u-w_s)$ is less $\Delta(w_u^*-w_s^*)$, but unemployment rises.

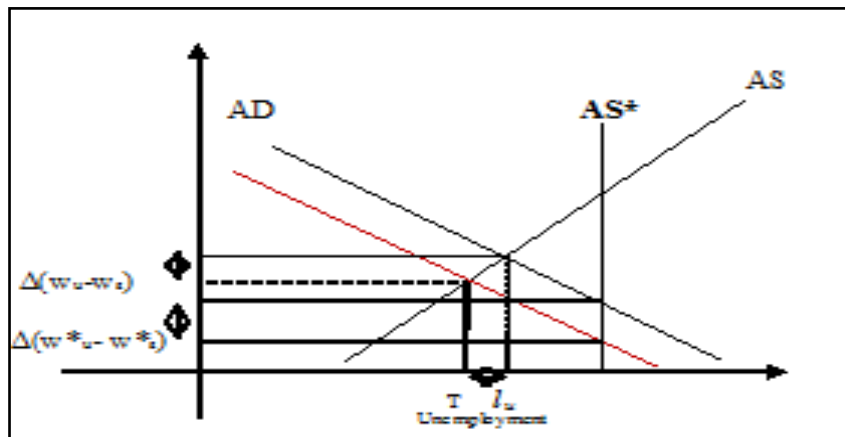


Fig 9. Effect Of Impact Of Technical Change On Labor Market Equilibrium

When taking into account wage rigidities, technological change affects both relative wages and unemployment.

VI. FROM HUMAN CAPITAL TO A BROADER CONCEPT OF INTANGIBLE CAPITAL

VI.1. Human capital and social capital

➤ Social capital

In sociology, social capital is the expected collective or economic benefits derived from the preferential treatment and cooperation between individuals and groups

According to the OECD definition, social capital is networks, together with shared norms, values and understandings that facilitate cooperation within or among groups. Networks refer to concrete links between groups or individuals, for example, networks of friends, family networks or networks of former colleagues. Norms, values and understandings are less tangible: the sociologists define as sometimes unwritten rules, but widely accepted within a society.

➤ *Are Human and social capital related?*

Human capital and social capital do not exist independently of one another. They maintain complex relationships, and to a certain extent, feed each other. In other words, through complex mechanisms, social capital promotes the development of human capital and human capital promotes the development of social capital.

VI.2. How social capital contributes to human capital?

Schoolchildren know that the main threat to them when they leave the course come just neighbors. Their fear of discovery based on social capital (the relationship between the child's family and neighbors) that contributes to the development of education. We then say that "communities with high social capital tend to have better grades than those in which the social body is fragmented and where people are more isolated."¹² Some sociologists have analyzed the dropout rate in high school to determine if they were related to the level of social capital in families and communities. Measuring factors such as the degree of attention paid by parents to their children and family relations with the community in a broader sense, it was found that children are more likely to continue their education when capital is high.

Paradoxically, social capital can also be a barrier to education. Indeed, in communities which place little value, children and adults are discouraged from learning or pursue lifelong learning.

VI.3. Does human capital contributes to social capital?

Generally, it is assumed that human capital contributes to social capital. In this sense, education helps young people become aware of their responsibilities as members of society. Similarly, it is verified that more people spend time on education, more social and civic engagement is high. However, if several studies confirm that education enhances civic and social engagement, the link between them is not entirely clear.

To better understand how education affects our behavior, which is at the heart of the issue discussed here, we must not only consider the level of education of the individual, but also the level it has over other individuals and the level of education displayed by the total society. To understand how these mechanisms work, take the example of an individual much more educated than the other members of his community. According to some sociologists, his high social status encourage them to get involved in the political, as it will be sure to get close to the levers of power. In contrast, less educated individuals may come to the opposite conclusion, to deter political engagement and prefer to engage only in his community.

VII. HUMAN CAPITAL VS. CULTURAL CAPITAL

These two concepts are not exactly the same level and are not in direct competition. But as the cultural capital may designate among other knowledge or attitudes embedded in the individual, it may be appropriate to compare them.

VII.1. The origin of the concept of cultural capital

It is important to compare the approach of Becker to that proposed by Pierre Bourdieu and Jean-Claude Passeron. The authors wish to highlight the role of the school in the reproduction of social inequality. Their key concept is that of cultural capital.

The idea is that children from favored social origin receive in their family knowledge and behaviors that are valued in school. Thus, they have a cultural heritage that strongly favors their success in school. Thus, the intergenerational transmission of social inequality is ensured by a more delicate than the mere transmission of material wealth.

Indeed, the children of favored origin have greater proximity with the school culture. They read books, go to museums, etc. They acquire, within their family, a language, a way to express themselves, which are those expected by the school. In contrast, children of socially disadvantaged to see imposed on a language school is not that they practice at home. School transmits to students a cultural practice which does not provide itself. It expects the knowledge, which provided no keys. Thus, under the guise of equality of opportunity, the school provides a reproduction of the dominant social class, reproduction occurs way more effective it is hidden.

¹² Taken from « La nouvelle économie: Mythe ou réalité? », OECD report on growth , 2001, Box IV, p65.

VII.2. Properties of cultural capital

Bourdieu describes cultural capital in the embodied state (which is its "ground state"). He also studied the consequences he draws from this property of incorporation that could be taken to describe the properties of human capital, "the accumulation of cultural capital requires incorporation which, as it implies a work of inculcation and assimilation, costs time and time that must be invested personally by the investor [...] This 'personal' capital cannot be transmitted instantaneously (unlike money, the same title or title nobility) by gift or inheritance, purchase or exchange [...] cannot be accumulated beyond the capabilities of a singular ownership agent, it withers and dies with the holder (with biological capacities, memory, etc.)"¹³.

Note that these common properties are different from those of physical capital. Indeed, the emphasis on time as essential input in the production of cultural capital cannot fail to recall the analysis of Becker, in which the shortfall appears to be the main cost of human capital. Of course, this shortfall is due to the time that the individual must devote to training rather than paid work. Passeron (1982) has shown that comparing education to physical capital is interesting. Firstly, because some properties are common to both. Secondly, because this comparison allows considering what makes the specificity of human or cultural capital. It appears that for each of these two concepts, the specificities in relation to physical capital flow all the property of incorporation. This is identical to the analysis developed by Jean-Pierre Jarousse about human capital, "the assimilation of human capital to physical capital is imperfect and is distinguished from the first second on many levels. All these features result from the essential property of human capital: its incorporation into the person".

VIII. CONCLUSION

The empirical observation allowed us to witness today a renewed interest in human capital. This became essentially with the increased education activities and training and a decline in demand for unskilled labor. Also, we have traced the existence of a strong complementary relationship between human capital and cultural capital.

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