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An evaluation of education relations together with technology, employement and economic development components

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Abstract

Today, the industry has created demand for well-trained people. In the labor market, educational system depending on competition has expanded to provide more skills for more people. On the other hand the production of information technology imported from abroad and the adoption of these manufacturing techniques ensure compliance; research and development activities supported by educational activities are closely related to each other. Education, by increasing labor productivity is also contributing economic growth. Productivity is increasing with education results in variety and increase of the earnings of the labor force at different education levels. Relevant literature on topic shows that economic growth is being accelerated in countries where education level is higher. The contribution of education to economic growth in some cases is more than physical capital, when trained manpower and expectations of the economy are taken into consideration. Thus, individuals in a country where they benefit from education services constitute an integrated capital for themselves. This also necessitates forming to create human resources in a country to accelerate economic growth and to use these resources in required fields. In this study, it is objected to bring a concept of perspective in interaction of education and technology, employment with economic growth.

Keywords: Education; employment; technology; economic growth; human resources.

1. Introduction

Natural and social environment, in which we are, are constantly changing, and the repeatedly living conditions form themselves. This situation gained momentum especially at the end of the 20th century in which the concept of "Information Age" has been a part of, and gone into our life. Both instinctive and learned responses to adapt to the direction changes are no longer adequate enough in both quality and quantity. This situation has increased the requirements of the learned response, and this requirement has led to a rapidly increasing need for education (Kızıloluk, 2007). Meeting of training requirements needed necessitates people's adapting to today's technology, so this situation will provide the employment to be easy and thus economic growth to advance in a positive way. Many of the scientific research have revealed that the relationship between education / education level and technological

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development is a linear one. . In this study, it is objected to bring a concept of perspective in interaction of education and technology, employment with economic growth.

2. A brief recall for education

Although many definitions have been made relating with education, it may be defined for the basic nature of it, as transferring process of the knowledge and culture of humanity from generation to generation (Thompson, 1973). Education with this definition includes all efforts to increase about the development of human behavior, knowledge and skills. With a similar definition, education is a process of deliberately changing of individuals' behavior through their own lives (Erturk, 1972). With this definition, it is stated that the individual's behavior changing should be in a required direction, and it cannot be arbitrary. Thus, education has predetermined objectives. When it comes to purposes, there are differences for each country (Tezcan, 1991). Because it is the human being that will govern the state, plan , set up, operate factories, distribute products, consume goods, do agricultural activities, build roads, dams, houses, or do opposite of them creating problems and solve them. In these circumstances, it is inevitable to equip the people with required behavior and skills by educating them (Sonmez, 2001).

It is the basic aim of education to provide a healthy society with high level of information, both individually and with a universal culture. With this aspect, education is responsible for change in society, and has to comply with changes more than any other segments of the society. Because a country's prosperity and happiness depend on training the people continuously qualifiedly, contributions to economic growth of the people with knowledge and skills that they have taken through education (Cakmak, 2008). Educational needs required in a social system should be met systematically. That is, all the countries should have an education system capable of resetting changing modern production styles and methods. (Duman, 1991). Because it is among the economical tasks of education to meet the brain and human power needed by economy. (Bursalıoglu, 1978) Education operates as a catalyst in development of a country's economies (Sarıcay, 2009).

3. Relationship of education with technology

Today, the economic development of societies is possible through developing new technologies and transferring them into their social and cultural life. To say that industrialization process has completed is a fantasy and; this process is a structure in itself that is constantly changing. Saying that the process of industrialization is completed, and nothing can be done, one cannot remain settled. Together with changes, there are developments occurring. These developments make changes necessary in the way of life. Information received, due to the changing technology gets unavailable. On this basis, a service worker is hired by a work place with certain expectations, and these expectations may get insufficient in time. For an individual to sustain the productivity, he or she may have to develop and gain new qualities according to the order of that day's conditions (Ultanır, 2005).

On the other hand, innovations brought by technological developments are closely related to the economy and the economy has entered orbit of technology (Ansal, 1996). So, as a result of both science and technology, production, and technological opportunities, circulation of scientific knowledge has provided to grow individuals with higher creativity potential. As a result of this development, countries have been faced with significant changes in both economics and politics. The speed of this change increasing gradually has accelerated tendency of continuous modernization and development and the competition for having more knowledge and more new Technologies. Parallel to these developments, there has also been rapid changes in education filed and education system has also been affected from them (Cakmak, 2008).

Today, the resources allocated to education should not be seen as an expense, and even should be regarded as the most profitable investment necessary for countries (Unal, 1985). In developed countries, administrators accept education as a tool for development of human resources (Sedef, 2005). Actually, the countries understanding the money spent on education is very productive, have allocated a significant portion of national income on education.
In the study by Kim (1997) for developed countries, I has been put forward that more than half of economic growth was caused by the new production methods leading to productivity, there are similar studies in the literature like this one.

As stated above, technological developments and scientific advances are the ones determining and shaping a country's economic development, and they emerge as outputs of education. Technological development and change

are very fast in our world experiencing information age. Therefore, developing countries hoping to achieve by becoming industry with only imported technology, are no longer benefitting from these opportunities. Because the imported technology is losing its adequacy and validity rapidly and they cannot sustain competition capability (Cakmak, 2008).

4. The relationship of education with manpower and employment

Technological developments and changes directly affect and format the working life. By knowledge and technology entering into every aspect of our lives, the structural transformations in the field of employment has started happening. The share of employment in services and information sector has started to increase especially in developed countries (İcli, 2001). Therefore, well-trained manpower is also needed in a country's economic development besides capital and technology. Knowledge and skills acquired through education for achieving this will both affect both communities' development and will decrease the negativity due to lack education of the individuals.

The skills gained through education for the Manpower needed for economic development makes them productive meet the need of society in industry, agriculture and services (Fidan, 1986). Educated manpower which is one of the most important factors of economy, produce better quality and more goods and services spending less time, less effort and less money (Kızıloluk, 2007).

Nowadays, the quality of manpower generally is measured as long as it remains within the school system. Educational institutions both include universal values and have the ability to transfer circulation technology to everyday life. Manpower having this ability displays the skill of using national resources in international competition (Tatlıdil, 2000). Therefore, for development of manpower, in addition to extension of compulsory education, it is important for vocational and technical education programs to be developed.

Education and employment interact with each other complementarily. Manpower using vocational and technical education should be made qualified and new training programs suitable to technology should be created. Because it also gets difficult to have unqualified manpower be employed. In other words, doing this will both develop manpower more and make its employment easier (İcli , 2001). Therefore, manpower, which does not renew itself, improve itself continuously have knowledge and skills necessary for current production technologies, face unemployment. This problem can be solved by for the education system to be more flexible in order that the individual can adopt themselves to the changing work conditions and technology (Ustun, 2004). The lack of Manpower in changes and development on production, knowledge and technology can be resolved by in-service training (Kızıloluk, 2007).

5. Relationship between education and economic growth

The basic condition in economic growth which can be defined as the permanent increase in a country's national income is the increase of the total amount of production factors used in production (Hesapcıoglu, 1984). One of the most important goals of national economic policy is economic growth. Another matter related with education and economy is cost analysis. To measure the return of the spending on education is very important in any country, as well as in developing a country. There are different methods used to measure this return. One of them is cost-benefit analysis (Cınkır, 2000).

In the calculation contribution of education to the economic growth, the economists often use the Cobb-Douglas Production Function. Two production-factor derivated Cobb-Douglas Production Function;

$Q=A+\alpha N+\beta K$ $(\alpha+\beta=1)$, can be written (Sarıaslan, 2009).

Q = Production output

N = labor input

K = Capital input

α = Labor output in production ratio (%)

β = The production of capital output ratio (%)

A = Surplus factor (the part not explained by labor and capital increase in production)

Schultz and Denison investigating contribution of education to the economy for the American economy, have concluded that surplus factors causes about two thirds of growth except the factors known as labor and capital (natural constant) (Schultz, 1961; Denison, 1962).

Surplus factors are also derived from technical progress and the same amount inputs entering into production provide more output in time (Sarıaslan, 2009). The first of two progress defined as "All the Non-integrated Technical Progress" “Integrated Technical Progress” affect the quality and production factors and, the latter; refers to the developments in the nature of production factors. For example, better trained manpower integrated with labor is labor progress but, devices integrated with capital doing the same job for the same price, lower costs or more is technical progress (Sarıaslan, 2009). It is evident that technical progress including surplus factor has many dimensions. The dimension integrated with education is one of these dimensions (Sarıaslan, 2009).

Schultz (1961), one of the researchers trying to find rate of education in unexplained factors reviewed the U.S. economic growth between 1929 and 1957, and found this rate as 36% - 70%. Denison (1962) trying to find the rate of education in surplus factor for the same period found this ratio as 23% and stated that it is more than of physical capital (15%) in the same study. It has been put forward in this study that the contribution of education to economic growth 7% in the UK, 14% in Belgium, 15%in U.S. 16%in Argentina, 25% in Canada (OECD, 2005).

On the other hand there are also studies available trying to find the existence of the correlation between education and economic growth. These studies are usually related to literacy rate. In the study by Bowman and Anderson's for 85 countries,it is determined that It is a pre-condition to have a literacy rate of 40% for exceeding $ 300 GNP, and 90% for exceeding GNP 500 dollars. In addition, according to Anderson, for economic development’s starting the first step is to have a literacy rate of 40% (Blaug, 1972). Kaser in his study for 12 developed countries has determined that economic growth rate is bigger following the ten-year period after years of schooling is higher (Robinson & Vaizey, 1966). Harbison and Myers have pointed out in their study (1964), that schooling rate of secondory and higher education rate is closely related to GNP. On the other hand, there is a linear relationship between the educational level of manpower and economic growth rate. The rise of a society's level of education will improve the quality of labor and therefore will increase production capacity. This can only be possible by investing in human capital (Erdogan, 2006).

6. Conclusion

Besides Relevant theoretical framework and empirical studies, the quantitative values acquired from public institutions suggests a spiral relationship of education with technology, employment and economic growth. It has been seen that an important part of these studies has been modeled and implemented. According to certain indicators, in countries where education level is higher, economic growth has also accelerated. Increasing the resources allocated to education in the national economy, by increasing the quality of labor, impact the mid and long-term employment in significant and positive direction. It is also understood that economic growth has a relationship with "literacy level” which is the most basic parameters of education. Furthermore, it has been put forward that education affects the economic capital size directly. In addition, it is observed that better-trained manpower reduces the production and management costs and indirectly creates a technical progress. With the entry of creative individuals equipped with more knowledge into R & D activities, technological advancement is even more impetus. It is understood that when acquisitions gained with manpower enter manufacturing and service sector, they make a difference in both.

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