

## EXPANSION OF TECHNOLOGY VIA EDUCATION

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### Abstract

*Recently, governments' vital task is to provide the use of production sources effectively. Experiencing information revolution, intellectual capital's becoming forefront make high level education obligatory especially for human capital. It means that in order to have economic improvement and superior competitive power, the governments have to implement policies providing citizens' personal development and supply the adequate substructure on their personal progress opportunities*

*The basic differences in per capital income among the countries stem from technological structures in a limited sense and economic structures on the large scale. The differences on the changing technological development rate among the countries affect the world income distribution. Taking the structural differences of countries and regions into consideration, the investigations of both the capital and skilled labour or human capital earned by technology, the novelties and technology become critically important.*

**Keywords:** Education, Technology, Technological Development, Technological Expansion, Brain Drain

### 1. The Technology Concept

Technology includes everything defining the level of effectiveness of product and service production - oriented human activities. It covers general, scientific information, mathematics, philosophy, accumulation of aesthetics and transaction techniques.

There are many definitions on the term 'technology'. There is not a definition agreed upon technology. The most simple and narrow sense of technology is information, know-how and experiences which are necessary for the production of the goods and service. This expression is mentioned in most definitions. Therefore, technology is closely related to production of the goods and services. However, Dunning extended the definition and defined technology as 'an information source to improve the production and marketing activity of the existing asset and services and to create new commodity and services'. At an early date, he defined technology as 'a technological and organizational capacity output which turns financial and semi-financial sources into manufactures and semi-manufactures'. According to these definitions, technology includes each kind of production information. A more detailed definition of technology is 'the methods which are used in solution of the problems of

enterprises in all kinds of services. Thus, it could be defined as ‘technical and administrative methods and information used in the all process from planning of the production to distribution of the goods and services’. With a similar approach, it could be said that technology covers production designs, factory projects (plant blueprints), patent, know-how, marketing techniques, distribution channel, and even all other operating operations [7].

At the present day, financial enterprises use technology in order to minimize the risk, develop the commercial activities and form their implementations. Technology creates global markets by connecting local markets via networks and it is also the most important power in the development process of the global markets [12].

‘Technology is a perishable source consisted of knowledge, skills and means which are necessary for production, distribution, maintenance, use and control of economically and socially demanded products and services’. Some other writers define technology more specifically. Howells assumes that technology should be accepted as novelty and all kind of scientific and technical change. Technology is also defined as machines, equipments and information and organization methods that change the inputs into products (goods and services). According to another definition, technology consists of the methods which collectively reflect various techniques, having a special target, from the beginning till the end of the service. Briefly, it is the branch of knowledge reflects the techniques that are used [7].

## **2. Development and Expansion of Technology**

The expansion of the information consists of two phases like technology; creation of the information and expansion. The first signs of this differentiation are seen on Schumpeter (1948). Gort and Klepper (1982) had created the expansion of the new product in order to make the expansion of information and innovation definite and Griliches (1957) and Davies (1979) had managed the expansion of the new process [9].

The development and expansion of the technology brings modeling up in two fields at the same time. On the one hand, creation of the invention and innovation related to development and alternation of technology, on the other hand, the imitation or expansion of an existing innovation or invention exists. Eventually, innovation-imitation is seen as a solution point in modeling of the expansion of technology.

Technology is a product of information industry and the inputs of this product is the researcher manpower, the funds allocated to R&D activities and technical information current. The places where the said inputs turn into technological production are universities, R&D enterprises, units and researchers. The output of the information industry is the results of the researches reaping benefits individually and socially. Therefore, technology is a powerful mean for development of economy and transformation of society. It is also an impulsive force for the modern civilization [10]. The developments in information and communication technologies, especially internet provide new opportunities in production, transmission, integration and usage [6].

In comparison to other traditional sectors, the activities in information and communication sectors are performed by enterprises which do not need to use great amount of capital at the beginning. This should be taken into consideration while explaining that high technological industries have greater economic pace of growth than low technological industries. Therefore, it is seen that information based technology parks lay the groundwork for the development of the information and communication technologies. Technology parks also form a basis for progressive steps that meant economic development.

## **2.1 The Relation between Educated Labour Force and Development**

The terms such as improvement, development and expansion etc. are variously used to define the economic situations of the countries and societies. Economic improvement and development theories are similar to each other according to their meanings and it causes confusion in the use. For instance; there is not an exact criterion about what is the meaning of the definitions of a poor, undeveloped, underdeveloped, developing region, country and society or a developed, prosperous, industrialized society [8].

The first target of the improvement is industrialization and maximization the level of drawing benefit from the technological information. Thus, a men power that has the necessary qualifications created by the industrialization process and new technologies (information technologies) is needed. Qualified human capital about the production of information technologies, use and development of service sector, in other words, educated human capital becomes important during process of turning into an information society than an industrial society. The new technologies forming the information technologies generally require labour force and high educated labour. The education could be categorized as pre-school, general education, mass education and post-school education. During the process of socio-economic development and in the information society, not only school education and having a degree are important but also the post-school education given by professional enterprises and continuity of the education are important [11].

In recent years, education is an obvious indication of the rapid growth. Soft wares, television, teleconference, computer and internet helps learning all around the world. Internet has changed in a pioneering way to help the students to gather information, provide more easily available the education, expansion of the ideas. However, underdeveloped countries still struggle despite all the improvement around world [3].

Nowadays, understanding the rapid economic and technological changes and developments has become important because these determined the required skills. The developments in the information and communication sectors have caused a reduction on the demand for the blue-collar worker and business firms have gone contraction except some certain sectors. In this process, while the demand for the white-collar workers increases, the demand for the blue-collar worker decreases and it causes an indispensable alternation. New created sector requires education, creative and high mobility labour [4].

The expansion of the technology has a complementary role on educated or skilled based labour force. For instance, there is a positive directed relation between capital goods trade and labour force motion. The transfer of a new machine carrying all technologies increases the demand for the skilled labour force in a short time [9].

The labour force has also undergone a change in the context of qualification during the process of computerized business world. Capitalism has intended the integration of the global market by developing the substructure of information and communication all around the world. Accordingly, experienced labour force is needed to form the supplies and contents concerning information technologies. [2].

Two approaches stand in the forefront while explaining the relation between the educated labour force and development. These are human capital accumulation based 'Lucas Approach' and human capital stock based 'Nelson-Phelps'. According to Lucas approach, level of outcome is depended on human capital level, more specifically; growth of outcome is depended on human capital growth because human capital is also a production factor. Nelson-Phelps approach, human capital is not an outcome; but it is one of the most important sources of the innovations. In other words, level of outcome (growth) is depended on the level of innovations (growth rate) in stead of level of human capital (growth) [9]. Filson ve Franco (2000) who worked for the international mobility of the labour force emphasized the importance of the expansion by means of educated labour force in high technological industries. They had explained that high labour force mobility is possible by semiconductors in computer software and hardware industries. According to Filson ve Franco (2000), the labour force mobility occurs because there is a difficulty in imitation of technical information, in other words, in imitation of know-how [9].

## **2.2. Brain Drain**

The location change in the labour force is called labour motion and mobility [14]. These high educated people would like to work in other countries or other cities rather than their hometowns because of the wage inadequacy, insufficient fields of business and social conditions. However, self-educated individuals have difficulties in achieving better working conditions in other countries by means of brain drain [5].

The governments might implement some methods in order to prevent brain drain because there is a negative relation between education, human capital, development, prosperity and brain drain. However, whereas brain drain has a positive effect on well-qualified labour force, it has a negative effect on unskilled labour force [13].

Drucker determined 'a sharp decrease in the employment of routine office works and an unemployment stemming from the shifting of employees whose works adapted to automation' in 1957 – 1977. His determination appeared in 'information revolution' with automation in 90s. The most striking examples of deterioration in living and working conditions of the workers are; decreases in real wages in the USA, lack of employment stability, insufficient employment in Japan, the dissociation of the labour force rapidly [1].

Besides, there is especially a student invasion from the developing countries to the universities and colleges of developed countries. Exchange agreements depended on the treaties between the governments have been done. A technological transfer could be mentioned by means of both travelers and students' carrying the information to their own countries and implementing it in their own countries. Transfer appears here as carrying technical information [10].

## RESULT

Mankind has been experiencing a great process of transformation since the second half of XX. Many alternations called as globalization cause important changes in social and political enterprises. In this process, the importance of knowledge has increased and well-educated man power called knowledge workers has become the most important factor for the countries. This development could be commented that the known relation between the manpower and economic growth has become more important nowadays.

Technology is one of the indispensable components of our time. The development levels of countries are assessed according to the technological conditions that they have. The usage fields of technology are quite widespread. Technology used in education, defense industry, and all other fields has also become indispensable in social and economic life. The importance of the R&D investments is a criterion for the expansion of the technology considering the developing and developed countries. The amounts of the developed countries for R&D investments are much more than the amounts in developing countries. The great amounts of R&D investments confirm this theory. In addition, the amount allocated to the education reflects the importance of the educational investments. However, the rate in the developed countries is excessively high in comparison to developing countries.

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