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**Education-Economic Growth Nexus: A Review**

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**Abstract.** This paper is focused on a review of education and economic growth relationship. It reviews both the theoretical as well as empirical literature relevant to education-economic growth nexus. The study of economic growth is an old area but addition to the determinants remained a unceasing during the history. The human capital-economic growth relationship is evident even from Adam smith theories. However, it got formal recognition in New Growth theories. The literature shows that human capital is not measurable directly; instead, some proxies are used for it. Education, health, research and development, experience and skills are some of the most commonly measures for human capital. Education as a determinant has been used extensively. Some of the studies recognize its positive role while others negative. Different levels of education showed different type of effects. It is concluded on the basis of reviewed literature that human capital in form of education affects economic growth through different channels.

**Keywords.** Education, Economics Education.

**JEL.** O10, O15, O40.

**1. Introduction**

The story of the economic growth is very old. Initially, it had a few determinants but with the passage of time, much was added to its determinants. The role of human capital in economic growth was acknowledged by economists ever since Adam Smith<sup>i</sup> but it was formally recognized in new growth theories. These theories modified the work of Schultz (1961), Arrow (1962) and Uzawa (1965) and as a result Research and Development (R&D), school enrollment, health, education expenditures, life expectancy, and on-the-job training emerged as determinants of economic growth<sup>ii</sup>. Lucas (1988) introduced human capital as a factor of production in the theory of economic growth. Human capital was introduced in form of education in the model which was on neoclassical growth theory. This explained how individual allocation of time to different current activities influences the productivity or his level of human capital in coming years. A time allocated for human capital accumulation today will bring fruits in form of increased productivity tomorrow. Human capital is embodied in person and it enhances the productivity of labor as well as physical capital. Human capital formation depends on returns in human capital accumulation. In process of human capital formation, an individual

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pass through different stages of education (Khan, 2012). Ngangue & Kouty (2015) quoted Foggel (1994), Deaten (2001), Weil (2005), and Madsen (2012) who emphasized the role of human capital in productivity and growth.

Barro (1991) used school enrollment rates as proxy for human capital and found positive association of real GDP per capita growth rate with initial human capital measured by school enrollment rates of 1960. It was concluded that the poor countries can follow the rich countries if they have higher human capital per person. Political instability has negative relationship with the investment and economic growth. It is suggested in a number of studies to investment in children more<sup>iii</sup>, which will have emotional, physical and cognitive effects on their lives. Higher investment in children will help them in achievement of higher economic capabilities as compared to those children who get less investment. Lower investment will result in lower income, poor health and poor economic capabilities. It will affect the society as a whole in form on unequal distribution of income, poor skills higher crime rate and more dependent population. Therefore, those societies who invest more will have more social and economic benefits than those societies who invest less in their children. The societies with less investment in children will have a higher proportion of population unproductive and dependent of public resources (Romer, 1994; Khan, 2012).

The major theme of this paper is to present of a review of the existing literature of the education-economic growth literature.

### 2. A Review of Education- Economic Growth Nexus

Human capital is known as the engine of economic growth in literature (Khan, 2012). Schultz (1961), Arrow (1962), Uzawa (1965), Lucas (1988), Mankiw, Romer & Weil (1992), Romer (1995), Weil (2005), Khattak & Jangraiz (2012), Khan & Khattak (2013), and many other studies<sup>iv</sup> recognize the role of human capital in economic growth in one way or other. Evans (1998) found evidence against different trend growth rates for selected developed countries and countries with well educated population. The exogenous growth theories were found consistent for 13 rich countries and 27 countries with relatively well educated population. The endogenous growth theories which describe the growth experience of 27 countries with least educated population in 1950s are supported by empirical evidence. It is suggested that the technical knowledge may be out of reach in those economies where the per capita stock of human capital is small. Interestingly, Pritchett (1996) is on the view that increase in education of labour force has no positive impact on growth rate of output per worker. The growth of human capital has large, negative and significant impact on total factor productivity. It is possible that schooling may not create human capital but it raises the private wage. In those economies where demand for educated labour is stagnant, marginal returns to education are falling. The institutional environment in many countries is bad and this may led to less contribution of educated labour to economic growth. Human capital does raise productivity but it needs proper environment for utilization. According to Asteriou and G.M, (2001) primary and secondary enrollment causes GDP growth but higher education enrollment cause in opposite direction. The finding in case of higher education indicates that acquisition of higher degrees may not improve ability to do a productive work. The study suggested that further research and technological development can change

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the causality in right direction from mathematicians, applied scientists, IT Experts to economic growth. Abbas (2001) found negative impact of primary school enrollment on economic growth in Pakistan and Sri Lanka. When the human capital is proxied by secondary school enrollment the impact becomes positive in case of both countries. The overall results confirm the positive role of human capital in economic growth of Pakistan. Seren (2001) found level effect of education on economic growth. Petrakis & Stamatakis (2002) used endogenous growth theories to link human capital to economic growth in three groups of countries with different levels of development by using pooled data. These countries were less developed, developed and advanced countries. The developed and advanced countries were covered by taking Organization for Economic Co-operation and Development (OECD) countries while less developed countries considered those poor countries out of OECD. The empirical evidence showed that contribution of education varies with variation in the level of development. There is strong link between education and economic growth. The study shows that the effect of primary and secondary education in economic growth is higher in less developed countries (LDC) as compared to OECD countries. The higher education contributed more to economic growth in OECD countries than less developed countries

Harman, Oosterbeek, & Walker (2003) found positive effects of schooling from education on economic growth. Albatel (2004) used Johenson-Jueslius Co integration test for finding the existence of any long run relationship between human capital and economic growth in Saudi economy during 1965-99. The results showed expenditure on Human resources and related policies had positive impacts on economic growth of Saudi Arabia. Foreign labor in Saudi Arabia satisfied domestic demand and made significant contribution to output growth during the study period. Knowledge and skills are beneficial not only for individuals but also for the Societies as a whole. The data supported the hypothesis of Human capital as engine of economic growth. He suggested government should go beyond emphasis on saving and investment only and investment in Human capital and technology should be enhanced. Investment in Research and people will generate beneficial externalities in form of knowledge and skill diffusion in the economy.

Glewwe & Hanan (2004) investigated the relationship Household resources and demand for education in Vietnam during 1993-1998. The period of was taken due to high secondary school enrollment in Vietnam. Consumption expenditure was used to measure household's wealth. The results show that increasing returns to education played no significant role in determination of education demand in Vietnam in mid 1990s. school enrollment increased in those households fastly who got greater increase in wealth. The model predicted an increase of 10.3% against actual increase of 1% for children of age 10-18 during 1993-1998. the relationship between wealth changes and variation in demand for education was found positive and significant. The wealth does play its role even if some of important variables like returns to education, quality of schools and opportunity cost are controlled.

Limam & Stephen (2004) got positive association between quality of capital and output in a group of 80 countries. The quality of labour however had positive impinge on economic growth in Africa, East Asia and the west. The effect was negative and significant in Latin America and south Asia. Khan (2005) compared Pakistan's growth performance with selected Asian

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countries during the period 1980-2002. The study used data set of 72 countries taken from Barro & Lee (2000), and World Development Indicators (WDI). The quality of human capital along with conventional factors of growth was also considered. Education and health showed significant contributions to growth. Investment in education and health can generate highly productive labor force and increase total factor productivity. The growth performance of Pakistan Economy was found on average better than a large group of low and middle-income countries. The results show that improving institutions and raising investment contribute to economic growth significantly. It was suggested to accumulate physical capital and to enhance the quality of institutions to accelerate the pace of growth.

Echevarría & Amaia (2006) developed an overlapping generations model showing the effects of mortality rate on the life expectancy of individuals, their education human capital and economic growth. The model finds the average change in human capital as engine of economic growth. The level of human capital is derived by the educational level and decision of retirement of individuals. The demographic characteristics also affect the quality of human resources. A change in mortality rate brings a change in the life expectancy which results in behaviour effect as well as composition effect. This paves path for economic growth. The study got negative relationship between social security and per capita GDP growth rate.

Lin (2006) studied the impact of human capital (education) on economic growth in Taiwan during period 1964-2000 by using augmented form of Cobb Douglas production function. The study used human capital as average number of years in formal education system in employed population instead of whole population. Various levels of education showed different types of effects. Elementary education contributed to economic growth at higher rate than other levels of education in the study period. It was suggested to improve the quality of higher education training as well as elementary and secondary education training to achieve economic growth. However, Akintoye & Adidu (2008) found a negative relationship between Human Capital investment and per capita income growth in Nigerian economy. Income strongly influences human capital as compared to impact of human capital on income. Capital spending on education promotes more than recurrent spending. The study suggested emphasis on qualitative education and strong attention to science and technology in Nigeria to achieve the desired level of economic growth.

### 3. Conclusion

It can be concluded on the basis of the above reviewed literature that human capital is an integral part of economic growth. The effect of education as human capital on economic growth is controversial in literature. However, most of the studies agree with the fact that human capital in form education effects economic growth positively. However, different levels of education can have different types of effect on economic growth.

### Notes

<sup>i</sup> See Pejovicj (1966)

<sup>ii</sup> See Lucas (1988) for reference.

<sup>iii</sup> Khattak & Jangraiz (2012)

<sup>iv</sup> For details see Khan (2012)

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