Role of Education in Growth and Development of the Society

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ABSTRACT

Plato believed, education is indispensable to the economic health of good society, for education, he said, makes citizens 'reasonable men' Education was regarded important on its own. Since education has high value in the society, Plato argued that a considerable part of a community's wealth must be invested in education. The positive contribution was emphasized by many philosophers and thinkers over centuries. A major contribution to the discussion on the contribution of education to development was made by several social thinkers and philosophers for several centuries. The role of education in economic development, in reducing poverty and inequality, as a possible contributor to greater social and economic equality and as an enhancer of development was widely recognized from the days of Adam Smith. Education rightly regarded as an important factor of economic growth and development, within education, focus has been relatively more on primary education. Several studies have analyzedthe contribution of literacy and primary education to improvement in poverty, agricultural productivity, health and nutrition, growth in population, human development indicators like infant mortality, life expectancy etc., and. Very few studies have examined the role of secondary and higher education in case of these aspects; and firmly concluded that literacy and primary education have significant effects on poverty reduction.

Keywords: Infant Mortality, Life expectancy, Productivity, Inequality, Income distribution, Neo-classical growth, Empirical studies, Parameters.

INTRODUCTION

Ancient scholars in many countries highlighted the importance of widespread education in development. Education, Plato believed, is indispensable to the economic health of good society, for education, he said, makes citizens 'reasonable men' Education was regarded important on its own. Since education has high value in the society, Plato argued that a considerable part of a community's wealth must be invested in education. The positive contribution was emphasized by many philosophers and thinkers over centuries. A major contribution to the discussion on the contribution of education to development was made by several social thinkers and philosophers for several centuries. The role of education in economic development, in reducing poverty and inequality, as a possible contributor to greater social and economic equality and as an enhancer of development was widely recognized from the days of Adam Smith. Even prior to Adam Smith, we find significant references in the literature to the equity role of education, besides the economic role in the creation of wealth of nations (see Vaizey 1962; Blaug1975). It was William petty who first advocated equitable distribution of education. Nehenia Green and James Stewart of the Mercantilist period also advocated mass education so as to increase agricultural productivity in particular and society's progress in general. Palmerstone favoured spread of literacy for various social and political purposes. The 18th and 9th Century school reformers in the US like Horace Mann, Henry Barnard, James Carter, Robert Dale Owen and George Evans favourededucational opportunities to be extended to poorer groups of population. Horace Mann, a typical example of these reformers, viewed the school as an effective instrument to achieve justice and equality of opportunity and to remove poverty. As early as in 1896, the role of education in reducing poverty was clearly recognized in Russia: "An increase of labour productivity is the only means to erase poverty in Russia and the best policy to achieve it is through the spread of education and knowledge" (Kahan 1963, pp. 400-1). Among economists, Adam Smith made extensive references to education, including generation of public benefits by education of all levels, university education included, and hence the role of the 'public' in providing it. He was followed by a long and honorable tradition of classical and neo-classical economists. By the end of the 19th century the thesis was clear: education makes significant contribution to development. John Stuart Mill, who followed Adam Smith, recognized the social benefits more clearly and more explicitly than Smith and other. In the early 20th century, Marshall emphasized that "most valuable of all capital is that invested in human beings "and that "knowledge is our most powerful engine if production; it enable us to subdue Nature and force her to satisfy our wants…"

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While there is a long tradition of economists who recognized the value of education in development, the important of education in the wellbeing of the nations is more clearly recognized since the heralding of the human capital theory by Theodore Schultz (1961). Schultz has convincingly demonstrated that education is an investment leading to human capital formation that contributes to economic growth. According to the human capital theory, education transf0rms raw human beings into productive 'human capital' by imparting knowledge and inculcating skills required by both the traditional sector and the modern sector of the economy, and makes individuals more productive members of the society, not only in the market place but also in the households and also in the whole society. The core of the human capital theory lies in the thesis that education increases productivity of the population in general and of labour force in particular, leading increase in individual earnings and thereby contributing to economic growth and reduction in poverty. The process of education influencing growth and income distribution is as follows: education creates a more skilled labour force which produces a shift from low-paid, unskilled and below-poverty employment levels, to better-paid, skilled and above-poverty levels of employment. This shift produces higher labour incomes, a reduction in skill differentials, and an increase in the share of wages in total output. The increase in the number of more educated and skilled people increases the ration of such people and decreases the ratio of less educated people in the total labour force. However, in the labour market oversupply of highly educated people results, given no change in demand, in lowering their wages and increase in wages of those with less education, thus contributing to overall reduction in income differences in the labour market (see Ahluwalia 1976,[.322). Thus, expansion of education influences not only the wages of those who receive better education, but also of those who do not have education or have less education. Education also compensates for adverse socio-economic background and opens up better socioeconomic opportunities for weaker of the society leading to faster mobility and to higher wages. In short, education reduces poverty and improves income distribution at the same time.

The human capital theory propounded by Schultz laid a strong foundation for treating education as an investment in human beings and for treating it as an important source of economic growth. It is now widely accepted that investment in human capital is one of the important factorof economic growth and development and the research that followed further highlighted the number of ways in which education influences socioeconomic well-being of the individuals and the society. First and directly, at individual level, it increases one's human capital; increases one's productivity in the labour market, and increases his/her earnings. Second, there are consumption effects of education. Educated people make more informed choices in their consumption patterns. Third, education reduces search time in labour markets for employment. Fourth, at societal level, there is found to be a positive correlation between education and health of the people. Fifth, there is an inverse relationship between average level of education and fertility rates, meaning that education reduces growth of population, which in developing countries is generally regarded as a positive aspect. Sixth, there is a direct relationship between education level of children and their parents' education. Seventh, education has an inverse effect on crime, a direct positive effect on social cohesion and technology development. Lastly, education produces several other positive externalities simple, and dynamic- social, economic, political and cultural, some of which can even by inter-generational.

The theoretical developments on the examination of the contribution of education to economic growth are very important. The neo-classical growth theory (Solow 1956, 1957) did not recognize education as a major input for production and hence education was explained by assuming an exogenous technological development; initially it focused much on physical capital accumulation. Schultz's human capital theory has indeed created a "human investment revolution in economic thought" (bowman 1966). The contributions of Schultz (1961), Becker (1964) and mincer (1974) have formalized the treatment of education as an investment and as a factor in growth theory. The seminal contributions of arrow (1973), Spence (1973) and Stiglitz (1975) raised questions on the human capital theory and the possibility of treating education as a signal to the employer instead of having any economic value on its own, a thesis which remained as a hypothesis, and which did not last (Blaug 1985). Schultz and Denison's growth accounting equations were again considered to be valid. According to the endogenous growth theories (Lucas 1988;ROMER 1986, 1990a, b) stock of human capital affects the growth rates of the economy: education facilitates technological development; higher levels of human capital lead to more innovations and higher efficiency or total factor productivity, which causes higher growth rates of aggregate income. The level of human capital is co-

integrated with the growth rate of the aggregate income. The production function now is a two-step simultaneous process, in which resources are used to produce education, and education enters the production process, in a way that allows increasing to returns to scale. These endogenous growth theories (e.g., Mankiw 1995; et al 1999) use two sector growth models and consider manufacturing firms as producing good and (research) universities as producing knowledge, which in is used in both sectors. The research on endogenous growth theories was enriched by consideration of externalities (Webbink 2000). The endogenous growth models show that the steady-state growth rate of output per worker depends positively on the level of available stock of human capital or endowment of skilled labour. Hence, an increase in the average educational attainment of the labour force will lead to a permanent increase in the long-term growth rate of per capital income. When a country reaches an advanced stage of development, the role of human capital on economic growth move from direct impact on labour productivity to an indirect impact through increase in capability of labour force as a whole to manage innovation and technical progress (Funke and Strulik 2000). As Chen and Lee (2008) stated, in the subsequent R&D based growth models, growth rate of per capital income depends only on parameters that are usually taken as exogenous, such as the growth rate of population, and no longer depend on the level of R&D resources or the stock of human capital. In such models, the levels of human capital and other R&D resources affect only the long-run level of per capital income, but not the growth rate.

Thus, as Psacharopoulos (2004) summed up, the major landmarks in theoretical contributions, beginning with Schultz's pioneering contribution, are as follows:

Table-1: Landmark Theoretical Contributions on Education and Economic Growth

Period	Theory	Exponents
1960s	Human capital theory	Theodore W.Schultz, Gary Backer,Jacob Mincer
1970s	Signaling and Screeing	Kenneth J Arrow, Michael Spence, Joseph Stiglitz
1980s	Endogenous Growth theory	Robert Lucas, Paul Romer
1990s+	Externalities, non-market	R. Venikker

Source: Psacharopoulos (2004, p.342)

EMPIRICAL RESEARCH: ROBUST AND POPULAR FINDINGS

Following Schultz (1961), there has been a phenomenal growth in research in Economics of Education, including in India (see Kothari and Panchamukhi1985; Tilak 2006b for surveys), that concentrated on estimating the contribution to growth and development. Studies include those on rates of return to education, production function methodologies applied to national income, agricultural productivity, poverty, income distribution etc. in recent years. Empirical research on endogenous growth models has become popular, that emphasized that the level of education attainment itself is based on initial level of education.

The nexus between education and development is so all pervasive, that it difficult to systematically describe, decompose and quantify the effect of education on each specific aspect of development. Secondly, the relationship between education and development is not unidirectional. Education contributes to development, and development of the economy contributes to further development of education. It is not exactly possible to assert which is the cause and which is the effect. Both are causes and both are effects. This bi-directional relationship is very important in understanding the role of education in development. However, I concentrate here on findings on the contribution of education to development. Based on an extensive review of literature (Tilak 1989a 1994, 2006a b; Psacharopoulos and Woodhall 1985), covering a wide variety of empirical studies -national, sub-national and international level studies, case studies based on field level data and observation, one can list a few robust findings on the contribution of education to growth and development.

1. Education Earnings: Economics of Education is abundant with studies that firmly established the existence of positive correlation between education and earnings. Individual wage earning systematically increase sig-

nificantly by increasing levels of education. Earning rise with increase in education levels, not rarely but almost universally and quite steeply and systematically, in case of the general population and also of sub-groups of the population- males, females, rural, urban, socially backward sections, etc.(Psacharopoulos and Tilak 1992). Higher levels of schooling are consistently associated with higher earnings. Studies using Mincerian earnings function have also shown that the relationship to be quite consistent. It is not mere correlation. Education has been found to have a strong casual effect on individual wages, the being higher in case of regular workers, compared to causal workers and the effect increases systematically by increasing levels of education, the effect being the highest in case of those who have higher education. As Blaug (1972) noted the universality of this relationship is well recognized beyond doubt.

2. Rates of Return: conventionally the contribution of education to economic development is analysed in term of education-earnings relationships and more conveniently in the form of rates of return. Rates of return are a summary statistic of the relationship between lifetime earnings and the costs of education. Beginning with Strumilin (1926), the first attempt on cost benefits analysis in education and Becker (1960) the first more systematic attempt after the beginning of the human investment revolution, we have a large number of studies on rates of return to education in various countries. Based on international comparative studies on this aspect (e.g., Psacharopoulos and Patrinos 2004), it has been concluded that the economic returns to education are reasonably high; they are comparable to rates of return to investment in physical capita. Investment in education may be equally if not more conducive to economic growth as investment in physical capital. On average, the rate of return to education in many countries has been around ten percent. Further, in many countries they are found to be increasing (Bourguingnon and Rogers 2008).
3. Agricultural productivity: A large body of empirical evidence on the contribution of education to agricultural productivity is available that shows that increase in effects 0f education on agricultural productivity significantly.physical effects of education on agricultural productivity of workers include (a) innovative effects such as ability to decode new information, know what, why, where and how ability to estimate costs and benefits of alternatives, and ability to establish quicker access to newly available economically useful information; (b) allocative effects such as ability to choose optimum combinations of crops and agricultural practices in least number of trials, and ability to choose optimum time for marketing, transportation etc.; (c) worker effects such as ability to perform agricultural operations more efficiently in the economic sense; and (d) externalities (see Welch 1970; also Schultz 1975). Abundant research on the relationship between education and agricultural productivity (Jamison and Lau 1982; Lockheed et., 1980; Tilak 1994) shows that education significantly influences productivity directly and indirectly by influencing the selection of methods of production, use of modern inputs like fertilizers, seeds and machines, selection of crops, etc.
4. Education and Economic Growth: Not only rate of return studies, but also studies that used production functions- starting from residual to endogenous growth functions have highlighted the vital role of education in improving the productivity of the labour force and/ or total factor productivity. A good proportion of rate of economic growth is estimated to be attributable to investment in education in many countries. The effect of education on growth is direct, as well as indirect. When a country reaches an advanced stage of development, the role of human capital on economic growth moves from direct impact on labour productivity to an indirect impact through increase in capability of labour force as a whole to manage innovation and technical progress. Further, as knowledge economy expands the role of human capital may outstrip physical capital and labour in determining aggregate growth rate (Romer 1998).
5. Education and Poverty: Voluminous reaches in the last 2-3 decades (.g., Fields 1980a, 1980b) clearly shows that education and poverty are inversely related: the incidence of poverty is the largest among the illiterate households, and the higher the levels of education of the population, the lower would be the proportion of poor people in the total population, as education imparts knowledge and skills that are associated with higher wage. In addition to this direct effect of education, the effect of education on poverty could be indirect through its fulfillment of other basic needs like better utilization of health facilities, shelter, water and sanitation. Fulfillment of education and other basic needs reinforce each other (Noor 1980; Tilak 1989b).in fact, education is recognized as an important basic need fulfillment of which helps in the fulfill-

ment of others that results in amelioration of poverty. Further, among the various anti-poverty measures, it has been found that education is a very powerful, statistically significant factor that breaks the poverty cycle, and takes people above the poverty line. In fact the relationship between education and poverty is bi-directional: education reduces poverty and reduction in poverty helps in improving educational levels of the population; this bi-directional relationship is found to hold good both at micro/household and macro levels. It is increasingly noted, education might serve as a batter measure to break this education- poverty cyclical trap.

6. Education and Income Distribution: Simon Kuznets (1955) predicted that income distribution in capitalist countries world become more equal as the labourforce "these changes in human capital are a basic factor reducing the inequality ibn the personal distribution of income. Analyzing the problem in his numerous works, both from a positive point of view (Tinbergen 1977) and a normative point of view Tinbergen (1970 and 1980) concluded that human capital is one of the most important determinants of income inequality. Many empirical studies in the later period have shown that education is one of the most important variables influencing positively the income distribution.
7. Women's Education and Development: Substantial research has shown very clearly that education of women matters a lot. It significantly contributes towards demographic improvement by reducing fertility, and improving the use of better methods of population control, by influencing the age of marriage, desired family size, etc., improvement in infant mortality, child nutrition, health of the members of the family, improvement in participation of children in educationand in their levels of education achievement through improving pre-school abilities of children, and participation of women, thereby in the household earnings etc. The effects of women's education on women's behavior on decisions relating to fertility, family welfare and health etc. are very significant (Noor 1980; Cochrane 1988) which in turn enhance the productivity of people and yield higher wages. In fact, a large amount of research has concluded that women's education has a higher effect than the education of men on several dimensions of development, which are not only related to women, but also related to the total population.
8. Education and Social and Political Development: It has also been observed historically that education helps to broaden the base of understanding among people, and thereby helps to strengthen the democratic process, which in turn could pave the way to the promotion of sustainable development, though a better understanding of the intimate relationships between environment, ecology and sustainable development. By strengthening democratic forces, education would help in promoting sustainable human development, making rapid social progress including abolition or containment of the elite's discretionary power (see Cohen 1998, p.15). As Sen (2001) notes, education enhances individual's choices in life. It is an instrument of economic expansion; it influences balance of power in the society; lower classes can acquire higher ability and more articulation to influence social decisions, thus contributing to more participatory democracy. Changes in power distribution will have positive effects on social relationships. The contribution of education is significant not only in the improvement of basic needs like health and nutrition, and in demographic development, but also thereby in strengthening democracy and political stability.
9. Threshold Levels of Education and Development: All types and nature of education do not necessarily lead to economic growth. Education has to be not only widely spread, but also qualitatively rich. It is important to no note that there is a threshold levels education development for education to have an effect on growth. The coefficients of education in wage regressions in India (Vasudeva-Dutta 20040 show that there is a significant jump in the coefficient between secondary and higher education, suggesting that secondary education may be a threshold levels for education to influence the earnings. Literature on education and agricultural productivity also makes it clear that there exists threshold levels of education for its impact to be significant and while this level varies for different regions marginally and for different purposes, mostly it is secondary level of education of about ten years of schooling. The threshold level of education is relevant not only for farm efficiency, but also for other activities like utilization of credit facilities, adoption of family planning methods etc. The multiplier effects of a modernizing environment on agricultural productivity gain are more likely to be available only where education is widely spread (Lockheed et al., 1980). As the

economy develops and technological advancement takes place, this threshold level goes up. Secondly, there is a threshold level in terms of education which does not have good quality may not produce significant effects on growth. Very poor quality education may not lead to development at all. As many (e.g., Behrman and birdcall 1983; fuller 1990; fuller et al 1986; Hanushek 2003)have shown, returns to investment in quality education are much higher than returns to investment in quantitative expansion of education. Recently based on extensive cross nation data, Hanushek and (2008) have found that cognitive skills of the population, rather than mere school of income and to economic growth. This also helps in reducing gap between rich and then poor countries.

10. Technology,Education and Development: The effect of education on growth differs due other factors like technology .In case of agriculture;the level and type of farming and the overall general and technological environment are also seen to be resulting in varying effect of education on agricultural productivity.As Schultz(1964)demonstrated, education would be more effective in a changing, modernizing agricultural environment where fertilizers and new technologiesare becoming available,than in a traditional one.Impact of education on agricultural productivity in high technology and better environmental condition like Japan, will different from the impact of education on agricultural productivity in low technology and poorer environmental like in Nepal and Pakistan.In fact,because of differences in level of technology development,certain growth models are not found to be relevant.For instance,Leeuwen and Foldvari(2008) showed that Lucas modelaccumulation of human capital effects economic growth, is relevant for developing countries like India; and Romer' model explains the growth of developed countries like Japan, which are near the technological frontierand where human capital is employed to expand the technological frontier.To sum up, extensive empirical research during the last four decades has established that education makes a significant positive contribution ton development directly as a factor of production, or in directly through innovations and technological development and through several externalities(Outlon1997). It has been found to improve productivity of labour force,enhance individual earnings, raise nation income, increase economic growth, raise agricultural productivity, reduce poverty, improve income distribution,etc.It also reduces infant mortality, improves life expectancy, reduces fertility and thereby reduces growth in population etc. Whether the impact is measured in monetary terms or in non-monetary terms, the positive contribution of education to development is quite significant in many countries. The contribution of education to development in economic such as those in Asia, as human resource led development'(Behrman 1990).

While education contributes to development in general, the relationship is not automatic,and not necessarily linear . It depends upon a large set of factors.Both the nature and quantum of effect of education varies from country to country , depending upon the level of development of the education system,the level of socioeconomic development, and the level of technological development.In some cases, education may not necessarily lead to highgrowth.This is also partly due to errors in measurement of educational attainment (Pritchet2001,Wolf 2002). An important aspect relating to the research studies is worth noting. Though education rightly regarded as an importantfactor of economic growthand development, within education, focus has been relatively more on primary education. Several studies have analysedthe contribution of literacy and primary education to improvement in poverty, agricultural productivity, health and nutrition, growth in population, human development indicators like infant mortality, life expectancy etc., and. Very few studies have examined the role of secondary and higher education in case of theseaspects; and firmly concluded that literacy and primary education have significant effects on poverty reduction. Studies on rates of return, though estimated returns to all levels of education, by showing that primary education yields higher returns than secondary and higher education, justified concentration of attention of policy researches and planners on primary education and its effects on development (Psacharopoulos 1984; Coicough 1993). In other words, secondary and higher education received only secondary attention. As a result, the role of primary education in poverty reduction and development is often highlighted and role of secondary and higher education is ignored. All this neglect in research, but for a few important studies in recent years (discussed in the following section), led many researchers to conclude that secondary and more importantly higher education is not important for development in developing countries. Consequently, the attention of the policy makers in developing

countries and of the international development organizations got narrowly concentrated on primary education only, as reflected in the global statements on Education for All, or the United Nations'Millennium Development Goals.

EMPIRICAL RESEARCH: ROBUST BUT LESS POPULAR FINDINGS

Higher Education and Development

But there does exist some important research, some of which is, however, more recent, that analysed the relationship between post primary education and development, and did find significant impact of secondary and higher education on growth (e.g., Barro 1991; Barro and Salai- i- Martin 1995; 1988; Mankiw et al 1992; Barro and Lee 1993a, b; Benhabib and Spiegel 1994; Petrakis and Stamatakis 2002; Romer 1986). For instance, the panel analysis of real per capital GDP growth rates in about 100 counties over three period, 1965-75, 1975-85 and 1985-90 by Barro (1991) showed that secondary and tertiary levels of education attainment of male adult population have significant effects on growth, and more over the growth is not significantly related to primary education. An increase in male secondary schooling by one standard deviation is estimated to raise the growth by 1.1 percentage points annually and higher education by 0.5 percentage points. According to Barro and Lee (1994),countries where the labour force had one year of secondary level more experienced a higher annual growth rate of about 1.34 points more. This is robust even with the introduction of additional variables like political stability, openness of the economy and black market. Benhabib and Spiegel (1994) have found that secondary education helps in innovating technology and in sustaining growth. Self and Grabowski 92004) found significant impact of secondary education on economic growth and the relationship is causal and statistically significant when secondary education is measured in terms of enrolments or in the form of stock of human capital. Jorenson (2000) estimated that a considerable part of the growth during the 1990s was attributable to research innovations at universities and larger proportion of higher educated workforce. While primary education serves as a threshold level of human capital development for economic growth (Azariadis and Drazen 1990), it is secondary and higher education including investment in science and technology that accelerates and sustains high economic growth (see Mc. Mahon 1999).

Even in case of India, there are a few important studies on this subject. Using recent data Mathur and Mamgain (2004) found significantly increasing effects of education on economic development (NSDP) per capital) by increasing levels of education. It is important to note that the regression coefficients for not only illiteracy but also for just literacy are negative and highest effects are found of higher education, followed by higher secondary and secondary education.

Very few major empirical estimates are available on the quantitative effect of specialized human capital (Schultz 1988) on economic development. In a relatively recent growth accounting exercise, Mathura (1987) estimated the contribution of 'technological change' to economic growth in India to be quite significant. Such research is relatively abundant particularly referring to agricultural productivity in India (Tilak 1994). Malathy and Duraisamy (1993) estimated rates of return (using Mincerian earnings function) to scientific and technical education in India. The average rates of return based on 1981 census survey data, are high and vary between 17.4 per cent (Under-Graduate Diploma) and 70.8 per cent(Ph. D. Degree). Though few studies are available on the effect of research and development on other aspects of national development, its contribution is well noted.

Estimates based on production function on a cross section data on india (Tilak 2007) similar cross section studies on 49 counties in Asia (Tilak 2003a), and larger number of countries (Tilak 2006a) Indicate a strong effect of higher education on development.

Higher education is also positively related to several human development indicators, in addition to economic development. Higher education is found to be very significantly related to the human development index and also to the gender development index. The higher the level of higher education in a society, where in stock or flow forms, the higher can be the level of human development. Through its influence on two main components of human development index, viz. the life expectancy and GDP per capita. It is not only life expectancy that is significantly related to higher education but also infant mortality, another measure of health is significantly related to higher education.Poverty is also found to be inversely related to the level of higher education. The relationship between poverty and gross enrolment ratio in higher education is negative and statistically significant.

CONCLUSION

A careful review of recent research leads to the conclusion that the general presumption on the weak or negligible role of secondary and higher education in development is not valid and that post-primary education plays a significant role in development. Post-Primary education leads to economic growth. After all while primary education gives the basic three r's and important and necessary for development, but not adequate for over all sustainable development. Most of the literacy and primary education Programme are also found to be not imparting literacy that is sustainable, so that children donot relapse in to illiteracy. Primary and even elementary education rarely serves as a terminal level of education. Even if primary education imparts some valuable attributes, in terms of attitudes and skills and if primary education is able to take the people from below the poverty line to above the poverty line, it is possible that this could be just above the poverty line. It is secondary and Higher education that can keep the people above poverty line without such a danger of falling back into poverty trap-educational poverty or income poverty and in fact it is Secondary and Higher education that can take people to above the poverty line by increasing the social, occupational and economic level of the households. Further it is Higher education that can ensure sustainable economic growth, as it is Higher education or the specialized human capital that helps individuals and nations to withstand economic shocks, face disequilibria and to be able to restore equilibrium. This is Secondary and Higher education that forms a human capability and human freedom that helps in attaining other freedoms.

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