K4D | Knowledge, evidence and learning for development

The contribution of education to economic growth

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Question

We would like to commission a rapid review on available evidence on the contribution of education to economic growth (beyond private returns, including productivity, social and economic returns etc). We would like a written report – a concise overview of the available evidence, a sense of how reliable the evidence is, and any significant gaps.

We are not looking at any particular region. It would be useful if evidence from LICs, LMICs and MICs could be split out. And we are interested in education overall, evidence split by basic, secondary, tertiary (and TVET if possible).

Contents

1. Introduction

There are many reasons why education is important, this report focuses on its contribution to economic growth and outcomes. Education 'can be defined as the stock of skills, competencies, and other productivity-enhancing characteristics' (WEF 2016). In general, education—as a critical component of a country's human capital—increases the efficiency of each individual worker and helps economies to move up the value chain beyond manual tasks or simple production processes (WEF 2016). Human capital has long been considered the most distinctive feature of the economic system and further work has proven the impact of education on productivity growth empirically.

The World Economic Forum 2016 suggested three channels through which education affects a country's productivity. First, it increases the collective ability of the workforce to carry out existing tasks more quickly. Second, secondary and tertiary education especially facilitate the transfer of knowledge about new information, products, and technologies created by others (Barro and Lee 2010). Finally, by increasing creativity it boosts a country's own capacity to create new knowledge, products, and technologies.

There is a wealth of literature on this topic, showing the long held expectation that human capital formation (a population's education and health status) plays a significant role in a country's economic development. Better education leads not only to higher individual income but is also a necessary (although not always sufficient) precondition for long-term economic growth (IIASA 2008). Woessmann 2015 surveys the most recent empirical evidence stating that it shows the crucial role of education for individual and societal prosperity.

Education is a leading determinant of economic growth, employment, and earnings. Ignoring the economic dimension of education would endanger the prosperity of future generations, with widespread repercussions for poverty, social exclusion, and sustainability of social security systems (Woessman 2015). For every US$1 spent on education, as much as US$10 to US$15 can be generated in economic growth (UNESCO 2012). If 75% more 15-year-olds in forty-six of the world's poorest countries were to reach the lowest OECD benchmark for mathematics, economic growth could improve by 2.1% from its baseline and 104 million people could be lifted out of extreme poverty (UNESCO 2012).

What level of education is needed for economic growth?

Investment in secondary education provides a clear boost to economic development, much more than can be achieved by universal primary education alone. Hence, the focus of the United Nations Millennium Development Goals on universal primary education was important but insufficient. Universal primary education must be complemented with the goal of ensuring broad sections of the population have at least completed junior secondary education (IIASA 2008). The Sustainable Development Goals (SDGs) also have education targets including that 'by 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes'. This shows more of an awareness of the importance of secondary education.

Only broad based secondary education and universal primary education is likely to give poor countries the human capital boost necessary to bring large segments of the population out of poverty. For more industrialised countries, tertiary education of younger adults also plays a key role in economic growth (IIASA 2008).

Policy implications

For international policymakers, more and better education should become the top priority because it empowers the people to help themselves and thus helps to improve governance and to reduce corruption. A concerted effort for much more primary and secondary education combining national and international forces would appear to be the most promising route out of poverty and toward sustainable development (IIASA 2008). Policy-makers interested in advancing future prosperity should particularly focus on educational outcomes, rather than inputs or attainment (Woessmann 2015).

Other considerations

Education concerns not only the quantity of schooling—the percentage of the population that completed primary, secondary, or tertiary education—but also, critically, its quality. Hanushek and Kimko (2000), for example, find that it is not merely years of schooling but the quality of schooling (which may be reflected in international examinations) that has a significant relationship with economic growth. Pavlova noted in her email communication that when The World Economic Forum measures secondary and tertiary enrolment rates, their measurement also includes training and the quality of education as evaluated by business leaders and the extent of staff training (WEF 2016).

The SDGs note that there has been major progress in education access, specifically at the primary school level, for both boys and girls. However, access does not always mean quality of education, or completion of primary school. Currently, 103 million youth worldwide still lack basic literacy skills, and more than 60 per cent of them are women.

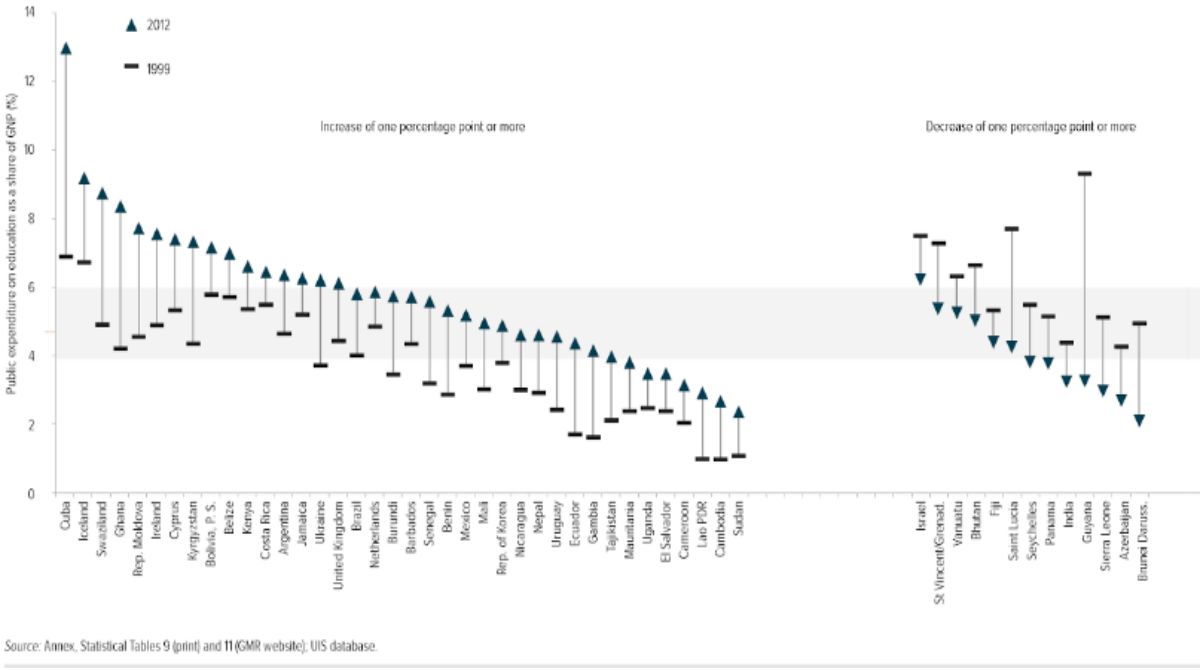
Hanushek et al (2010) review the role of education in promoting economic growth, with a particular focus on the role of educational quality. It concludes that there is strong evidence that the cognitive skills of the population – rather than mere school attainment – are powerfully related to long-run economic growth. The relationship between skills and growth proves extremely robust in empirical applications. The effect of skills is complementary to the quality of economic institutions. Growth simulations reveal that the long-run rewards to educational quality are large but also require patience.

The focus on human capital as a driver of economic growth for developing countries has led to undue attention on school attainment. Developing countries have made considerable progress in closing the gap with developed countries in terms of school attainment, but research has underscored the importance of cognitive skills for economic growth. This result shifts attention to issues of school quality, where developing countries have been much less successful in closing the gaps with developed countries. Without improving school quality, developing countries will find it difficult to improve their long run economic performance (Hanushek et al 2010).

Spending on education is becoming more of a priority worldwide. The graph below shows that a majority of countries have increased education spending as a share of national income since 1999.

Figure 8.1: A majority of countries have increased education spending as a share of national income since 1999

Public expenditure on education as a percentage of GNP, 1999 and 2012



Source: Annex, Statistical Tables 9 (print) and 11 (GMR website); UIS database.

Source: *UNESCO (2015) Education for All 2000-2015: Achievements and Challenges. EFA Global Monitoring Report 2015. UNESCO Publishing.*

Beyond economic growth

Additionally, health and survival rates, fertility levels and even the quality of a country's governance and institutions can plausibly be assumed to be linked to a country's levels of educational attainment (IIASA 2008). While completion of a basic education is associated with higher quality health indicators, progress on the other MDGs were influenced even more by the completion of a secondary education, and especially by women, for example in sub-Saharan Africa, an estimated 1.8 million children's lives could have been saved in 2008 if their mothers had at least secondary education – a 41% reduction (UNESCO 2011). Women with a secondary education seek out antenatal care and better medical treatment in general, take more measures to improve their children's health, delay marriage and have fewer children (thus reducing maternal mortality), are more likely to send their children to school, and have greater economic opportunities that will alleviate poverty and hunger (UNESCO 2010).

A note on the evidence base

There is a large evidence base on this topic. However, understanding how education influences a person's future is not straightforward. For several decades, economists have measured the effects of skills on work opportunities mainly by looking at the difference in earnings between people with different levels of education. These studies originally analysed the apparently simple relationship between wages, years of schooling and years of experience, controlling for basic demographic characteristics such as gender and age, to estimate the rate of return to education – the percentage increase in wages for each year of school (UNESCO 2012). The most recent compilation of studies from around the world suggests that not only are returns to education high in general, but the return to post-primary education is higher than for primary schooling

(Colclough et al., 2010). Yet there are wide variations in these patterns among countries. One reason for the mixed evidence is that the number of years of education is an imperfect measure of what young people learn. Simply completing primary and lower secondary education does not necessarily mean obtaining foundation skills. Also acquiring basic literacy and numeracy alone is not enough to get good jobs (UNESCO 2012).

Glossary

Primary education: Primary education is typically the first stage of compulsory education, coming between early childhood education and secondary education.

Secondary education: Typically takes place after six years of primary education and is followed by higher education, vocational training or employment.

Tertiary education: Tertiary education, also referred to as third stage, third level, and post-secondary education, is the educational level following the completion of a school providing a secondary education. The World Bank, for example, defines tertiary education as including universities as well as institutions that teach specific capacities of higher learning such as colleges, technical training institutes, community colleges, nursing schools, research laboratories, centres of excellence, and distance learning centres.

Technical and Vocational Education and Training (TVET): Vocational education is education that prepares people to work in a trade, a craft, as a technician, or in professional vocations. Craft vocations are usually based on manual or practical activities and are traditionally non-academic but related to a specific trade or occupation.

LICs, LMICs, MICs: For the current 2017 fiscal year, low-income economies are defined as those with a GNI per capita, calculated using the World Bank Atlas method, of $1,025 or less in 2015; lower middle-income economies are those with a GNI per capita between $1,026 and $4,035; upper middle-income economies are those with a GNI per capita between $4,036 and $12,475; high-income economies are those with a GNI per capita of $12,476 or more. A list of countries in each group is in the appendix of this report with a reference to the World Bank website.

2. Primary education

A considerable amount of evidence on the positive economic effects of a completed primary education, especially for those working in agriculture, has been generated over the past 40 years (UNESCO 2010). A study which modelled the impact of attainment in fifty countries between 1960 and 2000 found that an additional year of schooling can increase a person's earnings by 10% and average GDP by 0.37% annually (Hanushek et al., 2008). A different cross-country study claimed that each additional year of education increases income by 10% (Psacharopoulos and Patrinos, 2004). Generally, economic rates of return to individuals' and societies' investment in primary education have been reported to be higher in low income countries than in high income countries and to be higher for primary education than for secondary or tertiary education (UNESCO 2010). The Commission on Growth and Development (2008) concluded that social returns probably exceed private returns through the broader contribution to society of educated individuals.

An influential early study which analysed the effects of primary education on agricultural production in 13 countries found that the average annual gain in production associated with four years of schooling was 8.7% (Lockheed, Jamison and Lau, 1980). A more recent paper by de Muro and Burchi (2007) examined the relationship between primary education and food insecurity across 48 countries. The results showed that doubling the attendance rates in primary education for rural populations would reduce levels of food insecurity by between 20% and 24%. Some papers which measured the effect on income of the quality of education showed that these are higher than previously understood (Hanushek and Wossman, 2007).

The incidence of poverty across households is closely linked to educational attainment (UNESCO 2010). For example, a study found that in Papua New Guinea, people living in households headed by a person with no formal education constitute more than 50% of the poor while in the Republic of Serbia, the poverty level of households where the head has no schooling is three times higher than the national average (UNDP 2010a).

Basic education also impacts on poverty reduction and hunger. The feeding and body weight monitoring provided in many early childhood programmes can directly alleviate malnutrition while research based on the International Adult Literacy Survey has shown that adult literacy programmes can raise earnings potential at a similar rate as additional years of schooling (UNESCO 2010). The case of China has shown during the past twenty years that combating illiteracy aggressively is possible and can provide governments with the incentive for moving their citizens towards economic sectors with higher productivity (UNESCO 2010).

Social change and long-term prospects for economic growth rely considerably on the expansion of quality learning opportunities for all. Greater equity in both education enrolment and school quality across all population groups will result in a more equal income distribution and reduce socioeconomic inequalities in general (UNESCO 2010).

171 million people could be lifted out of poverty if all students in low-income countries left school with basic reading skills – that is equivalent to a 12% drop in the number of people living on less than $1.25 a day (UNESCO 2011).

The expansion of basic education leads to improvements in the other areas across the population in general. This is even more the case for socially and economically marginalised groups who have the most to gain from basic education (UNESCO 2010).

3. Secondary education

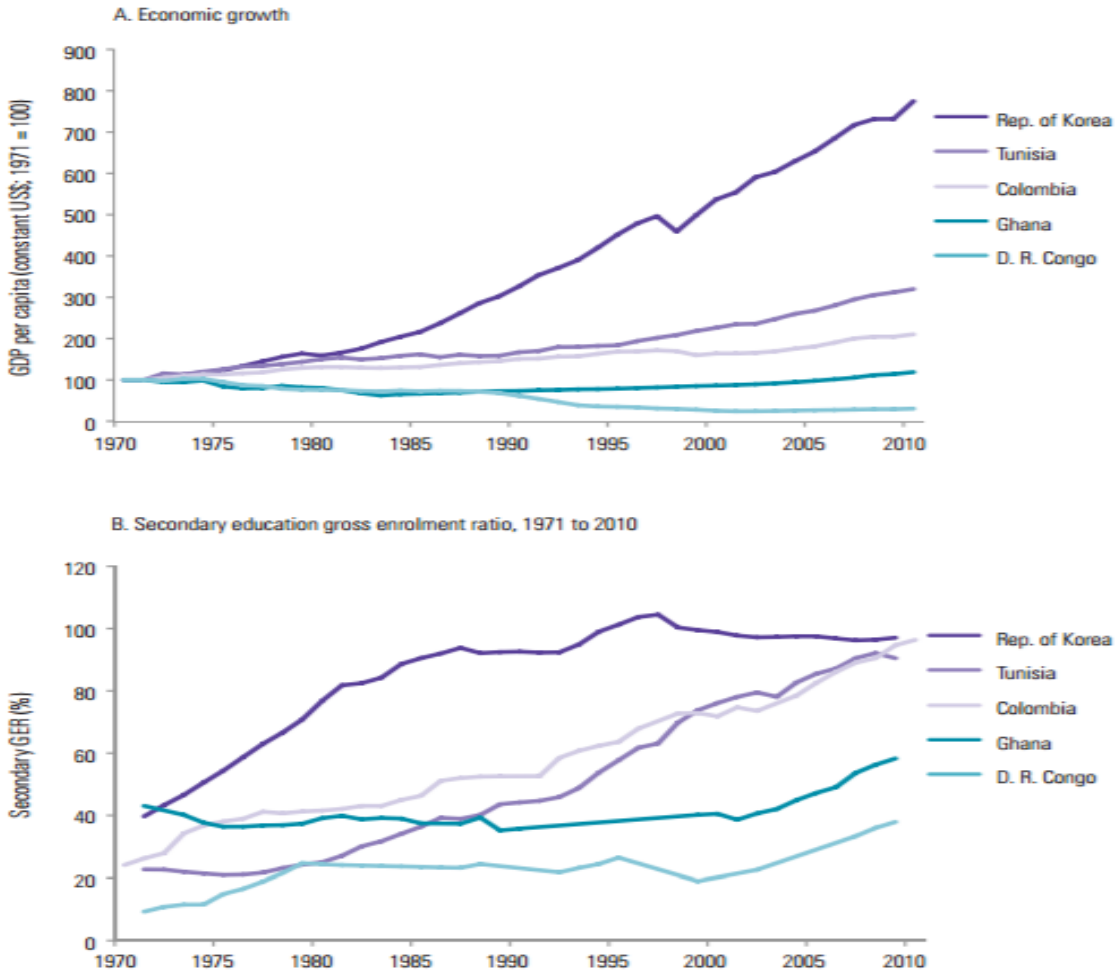
Investment in secondary education provides a clear boost to economic development, much more than can be achieved by universal primary education alone. Hence, the focus of the United Nations Millennium Development Goals on universal primary education was important but insufficient. Universal primary education must be complemented with the goal of giving broad segments of the population at least a completed junior secondary education (IIASA 2008). This IIASA study claims that data deficiencies are responsible for previous research study findings which show that changes in educational attainment are largely unrelated to economic growth. IIASA researchers completed a full reconstruction of the education attainment distribution by age and sex for 120 countries for the years 1970–2000. The advantages of this dataset compared to others arise from its detail (four educational categories for five-year age groups of men and women), its consideration of differential mortality, and its strict consistency of the definition of educational categories over time. This level of detail allows researchers to perform more detailed

statistical analyses of the relation between education and economic growth than had previously been possible (Lutz et al 2007).

Pavlova also cited the following evidence in her email communication when contacted for this report. Although official numbers are not available, indirect data shows a correlation between the enrolment rate in primary and secondary education and position of the country in the International Competitive Index (WEF 2016). For example, Laos is ranked 93rd, Cambodia 95th and Myanmar 125th (WEF 2016) in terms of the International Competitive Index; and enrolment rates in secondary education are especially low in these countries (ASEAN Secretariat 2015). Additionally, the figure below shows a correlation between economic growth and secondary enrolment levels when comparing five countries (UNESCO 2012).

Figure 4.1: The Republic of Korea's investment in skills development has contributed to its impressive economic growth

Economic and education growth in five countries with similar incomes in 1970



Note: The top figure is normalized with the year 1971 set to 100.
Sources: UIS database and World Bank (2012c).

Source: UNESCO 2012

Make secondary education a goal

In 2000 world leaders meeting in New York announced the United Nations Millennium Development Goals (MDGs). One goal that featured prominently was that of universal primary education by 2015. The SDGs, which followed on from these, also have education targets including that 'by 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes'. This shows more of an awareness of the importance of secondary education. A majority of the 94 low and middle income countries with information have legislated free lower secondary education since 1999. Of these, 66 have constitutional guarantees and 28 enacted other legal measures. As of 2015, only a few nations charge lower secondary school fees, including Botswana, Guinea, Papua New Guinea, South Africa and the United Republic of Tanzania (UNESCO 2016). However, 1/3 of adolescents in low and middle income countries will not have completed lower secondary school in 2015 (UNESCO 2016).

The graph below, showing different scenarios, highlights the benefits of complementing universal primary education with broad based secondary education. Only this step is likely to give initially poor countries the human capital boost that is necessary to bring large segments of the population out of poverty.

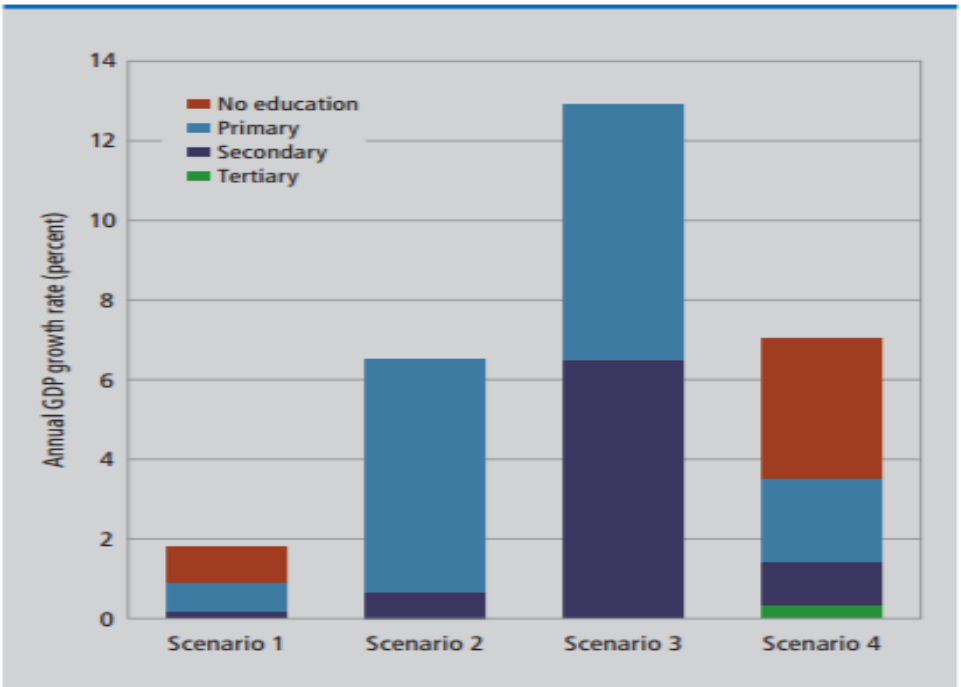


Figure 1
Annual GDP growth rates according to four alternative educational attainment distributions.

More details on this study can be found in the paper, but this report wants to highlight scenario 3 in this section on secondary education. Scenario 3 considers a possible new MDG effort that adds widespread secondary education (assuming 50% of the population achieves at least some secondary schooling) to universal primary. The model simulations indicate that this additional investment in secondary education provides a huge boost to economic growth, over five times

the level of the baseline scenario and also much more than in the scenario of universal primary education alone (IIASA 2008).

The data enables researchers to explore the education effects of different age and education structures. The findings show that there are differences in the impact of educational attainment on economic growth across age groups. In particular, tertiary education of younger adults (20-39), for instance, matters more in terms of economic growth than that of older adults, while the opposite is the case for secondary education (IIASA 2008).

While primary and other components of basic education remain a priority, the direct contribution of secondary education (particularly for young women) to the achievement of the other MDGs needs to be recognised and planned for. While completion of a basic education is associated with higher quality health indicators, progress on the other MDGs are influenced even more by the completion of a secondary education, and especially by women, for example in sub-Saharan Africa, an estimated 1.8 million children's lives could have been saved in 2008 if their mothers had at least secondary education – a 41% reduction (UNESCO 2011).

MDG 3 called for gender parity in primary and secondary education by 2005. Women with a secondary education seek out antenatal care and better medical treatment in general, take more measures to improve their children's health, delay marriage and have fewer children (thus reducing maternal mortality), are more likely to send their children to school, and have greater economic opportunities that will alleviate poverty and hunger (UNESCO 2010). However, another report found that the effects of completing secondary education on young people's ability to find adequately paid work vary by gender. In Nepal, young men who have not completed secondary education are more likely to earn an adequate wage than better-educated young women – over 40% earn above the poverty line, compared with fewer than 30% of young women who have completed secondary schooling (UNESCO 2012).

4. Tertiary education

HEART produced a Higher Education Topic Guide which looks at the contribution of higher education to economic growth (Power et al 2015). It states that traditionally the contribution of education to economic development was analysed in terms of the relationship between the level of education and earnings and also in the form of rates of return (A summary statistic of the relationship between lifetime earnings and the costs of education). Available estimates on the social and private rates of return to investment in primary education are the highest, followed by secondary education. Returns to higher education (HE) are the least. Such evidence was extensively used to discourage public investment in HE and to concentrate almost exclusively on primary education in the 1980s and 1990s (Power et al 2015).

Recent evidence, however, suggests that HE can produce both social and private benefits (Power et al 2015). Estimates of regional average social and private rates of return are shown in the table below, which is from the HEART topic guide. Although there are variations in the rates of return between several countries, commonly they show that investment in HE yields positive rates of return to the individual (19%) and society (10%) (Psacharopoulos & Patrinos, 2002).

Returns to HE

Region	Social (%)	Private (%)
Asia*	11.0	18.2
Europe/Middle East/North Africa*	9.9	18.8
Latin America/Caribbean	12.3	19.5
OECD	8.5	11.6
Sub-Saharan Africa	11.3	27.8
World average	10.3	19.0

*Non-OECD. Source: Psacharopoulos & Patrinos 2002

The HEART Topic Guide reviews a paper by Tilak. This paper found that the contribution of HE to economic development can also be measured with a simple regression equation. Using data from 49 countries in the Asia Pacific region, Tilak (2003) found a significant effect of HE (gross enrolment ratio and HE attainment) on the level of economic development (as measured by GDP per capita). Tilak (2003) pre-empted the argument that there only exists a correlation between the two by allowing a time lag for HE to *cause* economic development (GDP per capita from 1999 was regressed on the enrolment ratio around 1990). This suggests that action to improve HE needs to be taken now to allow time for its effect on economic development. Also, there are very few countries with higher levels of HE being economically underdeveloped, while all the economically rich countries have not necessarily advanced in the development and spread of HE.

Tilak (2003) also showed that the proportion of the adult population with HE (a measure of the stock of human capital) is an important indicator of the level of development. This 'stock' indicator represents the cumulative efforts of a country in the development of HE over the years. The larger the stock of the adult population with higher levels of education, the higher the potential for economic growth Tilak (2003).

India's rise onto the world economic stage is attributed by some to its decades-long successful efforts to provide high-quality, technically orientated HE to a significant number of its citizens Bloom *et al.* (2006). Research by Bloom *et al.* (2006) supports the idea that expanding HE may promote faster technological catch-up and improve a country's ability to maximise its economic output. Results show that SSAs current production level is about 23% below its production possibility frontier. A one-year increase in the HE stock would raise the growth rate of GDP per capita by 0.24 percentage points and African output growth by an added 0.39 percentage points in the first year. This implies that a one-year increase in HE stock may boost incomes by roughly 3 per cent after 5 years and ultimately by 12% Bloom *et al.* (2006).

The private market benefits for individuals include better employment prospects, higher salaries, labour market flexibility and a greater ability to save and invest Psacharapoulos (2006). Public benefits, although less well studied, also exist and include higher productivity and output per worker, higher net tax revenue and less reliance on government financial support (Psacharapoulos 2006). Rates of return focusing solely on the private and public financial rewards fail to encompass the broader benefits of HE manifested through

entrepreneurship, job creation and good economic and political governance along with the positive impacts of research on economies Pillay (2011).

The complex relationships in economic development with a focus on the context in which universities operate (political and socio-economic), the internal structure and dynamics of the universities themselves, and the interaction between national and institutional contexts have recently been studied. Initially a review of the international literature on the relationship between HE and economic development was conducted by Pillay (2011). This was followed by the study of three successful systems – Finland, South Korea and the North Carolina state in the US – that have harnessed HE in their economic development initiatives to distil implications for African countries (Pillay, 2010). Common to the success of all these systems is, amongst others, the link between economic and educational planning; quality public schooling; high tertiary participation rates with institutional differentiation; labour market demand; cooperation and networks; and consensus about the importance of HE for education and development.

Finally the key findings of eight African countries and universities – Botswana, Ghana, Kenya, Mauritius, Mozambique, South Africa, Tanzania and Uganda – were analysed and discussed (Cloete *et. al.,* 2011). The following three main conclusions were drawn:

- There was a lack of clarity and agreement (pact) about a development model and the role of HE in economic development, at both national and university levels, in all eight cases. There was, however, an increasing awareness, particularly at government level, of the importance of universities in the global context of the knowledge economy.
- Research production at the eight African universities was not strong enough to enable them to build on their traditional undergraduate teaching roles and make a sustained contribution to development via new knowledge production. A number of the universities had manageable student–staff ratios and adequately qualified staff, but inadequate funds for staff to engage in research. In addition, the incentive regimes did not support knowledge production.
- In none of the countries in the sample was there a coordinated effort between government, external stakeholders and the university to systematically strengthen the contribution that the university can make to development. While at each of the universities there were exemplary development projects that connected strongly to external stakeholders and strengthened the academic core, the challenge remains how to increase the number of these projects.

However, Hanushek (2016) suggests that the quality of basic skills is key and that more higher education without good basic skills does not pay. His paper states that higher education has yielded substantial rewards to individuals in terms of individual earnings. Partly for this reason, but perhaps more for the potential impact on productivity and economic growth, governments have pushed for the expansion of higher education.

However, once knowledge capital as measured by international mathematics and science tests is taken into account, school attainment (or years of schooling) per se is unrelated to economic growth. In this, adding years of university provide no greater impact than added years of earlier schooling. Higher education is important for skilled jobs but if universities start with students with stronger skills they produce better skilled workers. Looking across countries, the better engineers produced in countries with greater knowledge capital appear to have a distinct impact on growth differences. Part of this lack of impact of attainment of higher education in the growth models

Hanushek (2016) uses is probably that there are no good measures of university quality, so that very different outcomes are treated the same. But the achievement levels of students at an earlier age appears to provide an index of the aggregate skills of the students at the end of their schooling when each level of schooling builds on earlier knowledge.

Teles et al (2004) reached the conclusion that basic education affects agents' decisions over their lifetime. The paper found that the significance of the relationship between public spending on education and economic growth is altered by changes in the composition of government spending with regard to basic and higher education. This relationship may be insignificant when higher education is not promoted.

5. Technical and vocational education and training (TVET)

There is a strong message from the TVET literature that it works, but only when it offers comprehensive and complementary training, with links to the labour market. Browne (2016) argued that single-component TVET interventions are not successful. Recently UNESCO-UNEVOC (International Centre for Technical and Vocational Education and Training) and the National Vocational Centre for Vocational Education Research (NCVER) developed a tool on measuring 'investment- return' in terms of TVET (http://www.unevoc.unesco.org/up/05_Shanghai-Update_EN.pdf).

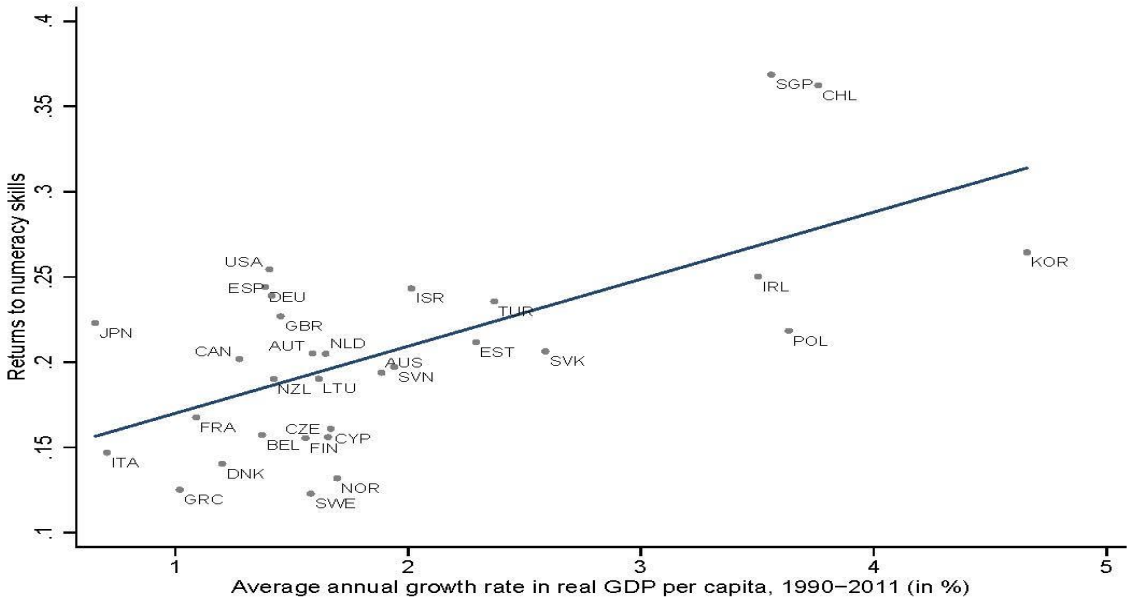
When contacted for this report Eric Hanushek stated that he is 'not a fan of TVET for development for two reasons. First, even if TVET makes the school-work transition easier, it makes it less likely that workers can adjust to changing economic conditions when their old skills are no longer needed (Hanushek, Schwerdt and Woessmann 2017). Second, with more rapid growth, the returns to skills become larger. This is just the development issue. Moreover, if TVET provides lower skills, individuals will find themselves in a bad position if there actually is growth and development (Hanushek, Schwerdt, Wiederhold, and Woessmann. 2017).

Hanushek et al 2017 test their theory that policy proposals promoting vocational education focus on the school-to-work transition. But with technological change, gains in youth employment may be offset by less adaptability and diminished employment later in life. To test for this trade-off, they employ a difference-in-differences approach that compares employment rates across different ages for people with general and vocational education. Using micro data for 11 countries from IALS, they find strong and robust support for such a trade-off, especially in countries emphasising apprenticeship programs.

They also conclude that the impact of vocational education varies considerably with the specific institutional structure of schooling and work-based training. While the declining age-employment pattern for those with vocational education relative to those with general education is found in all vocational education countries, it is most acute in the three apprenticeship countries in Hanushek et al's sample. The balance of early gains against later losses for vocational relative to general education is, however, not uniform across these countries.

However, workplace-based programmes that teach non-cognitive skills appear to be effective remedial interventions for adolescents. They motivate acquisition of work-relevant skills and provide for disadvantaged youth the discipline and guidance which is often missing in their homes or high schools. Successful interventions at any age emulate the mentoring and attachment that successful families give their children. Skills enable people. They are capacities to function. Greater levels of skill foster social inclusion and promote economic and social

mobility. They generate economic productivity and create social well-being. Skills give agency to people to shape their lives, to create new skills and to flourish (Kautz et al 2014).



International data from the Programme for the International Assessment of Adult Competencies (PIAAC) survey allow estimation of comparable labour-market returns to skills for 32 countries. Returns to skills are larger in faster growing economies, consistent with the hypothesis that skills are particularly important for adaptation to economic change.

6. Low-income countries (LICs)

Only broad based secondary education and universal primary education is likely to give poor countries the human capital boost necessary to bring large segments of the population out of poverty (IIASA 2008). For more industrialised countries, tertiary education of younger adults also plays a key role in economic growth.

Skills development is vital in reducing unemployment, inequality and poverty, and promoting growth. It also makes economic sense – for every US$1 spent on education, US$10 to US$15 can be generated in economic growth. If 75% more 15-year-olds in 46 of the world's poorest countries were to reach the lowest OECD benchmark for mathematics, economic growth could improve by 2.1% from its baseline and 104 million people could be lifted out of extreme poverty (UNESCO 2012).

After decades of low or no growth, sub-Saharan African countries experienced strong growth in the 2000s. Over a third of countries in the region have achieved growth rates of at least 6%, and some hope to achieve middle income status in the first half of the twenty first century. Experience

from the Republic of Korea[1] and the other East Asian 'tigers' suggests that sustained growth in sub-Saharan Africa will depend on sound economic policies coordinated with government investment in education and skills training that meets the needs of the labour market (UNESCO 2012).

Young people in LICs

In low income countries, less educated young people, who cannot afford to wait for the right kind of job, are at greatest risk of being in low paid work. While this may be partly because education levels tend to be low where there are other barriers to finding work that pays well, it is also likely that low levels of education are often the main reason young people are in poorly paid jobs. In Cambodia, for instance, 91% of young people with no education work below the poverty line, compared with less than 67% of those with secondary education (UNESCO 2012).

Young people living in rural areas in poor countries are more likely to have left school early, and to be in low paid work rather than unemployed. In rural areas of Cameroon, for example, the unemployment rate is only around 1%. Agriculture provides jobs for large numbers of young people with lower levels of education, but many are poorly paid. Two-thirds of rural youth with no education work for less than US$1.25 per day, with rural, uneducated women the worst off (UNESCO 2012). Education, particularly women's education, has the potential to play a key role in the achievement of more sustainable development in Africa (IIASA 2008).

Is education the solution to economic growth and decent employment in developing countries?

Sparreboom and Staneva (2014) state that increasing the level of education of the emerging workforce in developing economies will not in itself ensure an easy absorption of higher skilled labour into non-vulnerable jobs. Yet it is clear that continuing to push forth undereducated, underskilled youth into the labour market is a no-win situation, both for the young person who remains destined for a hand-to-mouth existence based on vulnerable employment and for the economy which gains little in terms of boosting its labour productivity potential. In general, earnings tend to rise in accordance with workers' levels of educational attainment and those with higher qualifications and/or more work experience can expect to earn more. Returns to education differ widely between workers in paid employment, for whom an additional year of schooling generally results in a higher income, and those in own-account work, for whom significant returns are far less certain.

The findings also underline the labour market segmentation in developing economies, in particular between workers in non-vulnerable employment (employers and employees) and those in vulnerable employment (own-account workers and contributing family workers). Workers in vulnerable employment are severely disadvantaged by both higher levels of qualifications mismatch and much lower levels of educational attainment. In low income countries, under qualification resulting from low levels of education is also more prevalent. Returns to education differ widely between workers in paid employment, for whom an additional year of schooling

[1] The Republic of Korea went from being poor to wealthy in just thirty years, partly by emphasising and planning for skills development. The state upgraded the skills of the whole population by achieving universal primary, then secondary, education. It then focused on supporting industries with skills training. In short, the state played a key role in matching skills supply to demand (UNESCO 2012).

generally results in a higher income, and those in own-account work, for whom significant returns are far less certain. Finally, the findings also point to the increasing importance of educational attainment beyond the primary level (Starreboom and Staneva 2014).

75 per cent of tertiary graduates were working in non-vulnerable employment. Unfortunately, completion of education at the secondary level alone is not enough to push youth through towards better labour market outcomes in low-income countries. Only four in ten young secondary school graduates were engaged in non-vulnerable employment in the low-income countries (compared to seven in ten (72 per cent) in lower middle-income countries).

Across all countries, the proportion of youth with less than primary or only primary education is greater for youth in vulnerable employment, while those in non-vulnerable employment are more likely to have a secondary or tertiary level of qualification (on average, 83 per cent of youth with tertiary education were in non-vulnerable employment). Poorly educated youth are more likely to work in agriculture and higher educational attainment is evident in industry and services, where productivity levels are generally also higher (Starreboom and Staneva 2014).

Completion of education at the secondary level alone is not enough to push youth towards better labour market outcomes in LICs. Only 40 per cent of young secondary school graduates were engaged in non-vulnerable employment in the low-income countries (compared to 72 per cent in lower middle-income countries). The returns to education for youth in own-account work are weaker than for youth in paid employment. This seems consistent with a view of own-account work as an option of last resort, which is less driven by economic opportunities, and also with the relatively high levels of qualifications mismatch in vulnerable employment. Unemployment rates in low-income countries tend to rise by level of education. Relatively high unemployment rates for better educated youth reveal that youth are not preparing themselves for the careers that are in demand in the labour market, and also that these youth are prepared to wait for the opportunity of a quality job (in the formal sector) (Starreboom and Staneva 2014).

How education interacts with the human drivers of development and how this affects economic growth

At the heart of the many problems faced by Sub-Saharan Africa are the intertwined challenges of rapid population growth and low human capital—human capital being defined here as people with a certain education and health status (Lutz et al 2008). The human drivers of development are made up of this interacting population–education–health triad in every world region. However in Africa, the interactions are particularly important in terms of bringing people out of poverty. Lutz et al argue that education is a fundamental determinant not only of health, demographic trends (in particular, fertility), and individual income, but also—and notably—of a country's aggregate level economic growth. It also shows that in order to provide the boost in economic growth that brings countries out of poverty, universal primary education needs to be supplemented by providing secondary education to a wide proportion of the population. However, in many African countries, slow or even stalled fertility declines have resulted in very high population growth, which seriously curtails the increase in school enrolments. For that reason, family planning also needs to be among the development priorities in Africa.

Population projections for Sub-Saharan Africa over the 21st century suggest a likely tripling of the population in 2000 to 1.5 billion in 2050 and 2 billion in 2100. Population growth depends, of course, on the uncertain future courses of fertility and mortality. But evidence published in 2008 by the Population Council of a "stalled fertility transition" shows that expected declines in fertility

in Africa cannot be taken for granted. Today, two-thirds of the population of Sub-Saharan Africa are under 25 years of age and the average fertility rate is still above five children. Women with higher levels of educational attainment almost universally have fewer children than women with lower levels of education (IIASA 2008).

7. Lower-middle-income countries (LMICs)

In many low income countries, large numbers are still in primary school at 15 to 19, an age by which they should have at least completed lower secondary education. Even lower middle income countries where half of those aged 15 to 19 have completed lower secondary, such as India, Indonesia and the Syrian Arab Republic, there are many who have never been to school, who dropped out before completing secondary school, or who are still only in primary school. The consequences of such low levels of education are grim for the young people concerned and for the countries in which they live. Many youth will be consigned to poorly paid, insecure and often risky work, and their countries will be deprived of the kind of skills that can drive economic growth. Ensuring that all young people achieve at least a good primary and lower secondary education is vital to give countries the skilled workforce they need to realise the demographic dividend for development (UNESCO 2012).

Quality

Far more children than expected in low and lower middle income countries are completing primary school without becoming literate. In Ghana, for example, over half of women and over one-third of men aged 15 to 29 who had completed six years of school could not read a sentence at all in 2008. A further 28% of the young women and 33% of the young men could only read part of a sentence (UNESCO 2012).

Inequality

Even in lower middle income countries like Indonesia, where most children go to school, almost 80% of 15- to 19-year-olds from the poorest households are not in upper secondary school or higher education, compared with less than 20% from the richest households.

A lack of skills is not the only reason many young people cannot get work that pays a decent wage. Stagnant economies, corrupt politics and nepotism can also play a role, as was starkly evident in pre-revolution Egypt. In a 2009 survey, 90% of youth complained about nepotism in job markets and 84% felt that corruption was growing in Egypt. Youth felt that their future depended to a large extent on their connections with the government (UNESCO 2012).

Policy implications

Governments should mobilise more domestic resources to ensure a sustainable source of funding for the post-2015 education framework. Low and lower middle income countries will need to spend 3.4% of GDP on pre-primary, primary and lower secondary education or 5.4% of GDP across all education levels. Public education resources need to be re-allocated to pre-primary education, non-formal schooling and adult literacy for the benefit of marginalised groups. Donors should greatly increase their disbursements to education and ensure that they are better targeted. Global development and humanitarian aid coordination must not leave behind the countries most in need of support. In light of the estimated $22 billion financing gap, donors will

need to increase the volume of aid for pre-primary, primary and lower secondary education in low and lower middle income countries by at least four times (UNESCO 2016).

8. Middle-income countries (MICs)

The impact of not being well educated may be different in middle income countries. For example, in low income countries, less educated young people, who cannot afford the wait for the right kind of job, are at greatest risk of being in low paid work. In some middle income countries such as Brazil, by contrast, unemployment plays a larger role (UNESCO 2012).

Another factor to consider is the value of skills, as was show by the World Bank's ongoing Skills Toward Employment and Productivity (STEP) study which is based on samples of households and enterprises in mainly urban areas of middle income countries. It surveys reading proficiency as well as task-specific skills, including numeracy and computer use, which are used both in and outside work. STEP confirmed the value of soft skills in general, and more specifically found that 'openness' boosts earnings, even when years of education are taken into account (UNESCO 2015).

When economists discuss the 'middle income trap' they have included education as one of the factors that may help the transition to high income country status, particularly strong secondary and tertiary education systems. While the process of convergence is often painfully slow, the transition from middle to high income does not on average take longer than other transitions. Likewise, comparing today's middle-income stagnators with countries that have reached high-income status suggests that "escapees" have simply always grown faster, even at lower income levels (Bulman, Eden, and Nguyen 2014). These countries' higher growth patterns may be explained by other underlying factors, such as rapid industrial transformation, low inflation, stronger exports, better quality education, or reduced inequality (Larson et al 2016)

Policy implications

59% of out-of-school children are concentrated in middle income countries. Nevertheless, the countries most in need of aid for basic services – low income countries and fragile states – should still be prioritised. Despite this, the share of basic education aid going to low income countries declined from 40% to 34% over the decade (UNESCO 2015).

However, investment in education and human capital development are crucial to growth for middle income countries. As the returns to physical capital accumulation diminish, the rate of productivity improvement and technological innovations depend largely on the presence of highly skilled human capital.

Additionally, no matter what policy options a country selects, it still faces the challenge of implementing them—and the kinds of implementation challenges confronting middle income countries (e.g., improving the quality of education, enhancing regulatory effectiveness) may require rather different capabilities than those that got them to middle-income status in the first place (e.g., sound macroeconomic management, provision of basic infrastructure) (Larson et al 2016).

9. References

Barro, R. J. and J.-W. Lee. (2010) ”A New Dataset of Educational Attainment in the World, 1950–2010.” NBER Working Paper No. 15902. Cambridge, MA: National Bureau of Economic Research.

Bloom, D., Canning, D. & Chan, K. (2006) Higher Education and Economic Development in Africa. (The World Bank, 2006).

Browne, E. (2016) What works in youth employment programmes?, HEART Helpdesk Report

Cloete, N., Bailey, T., Pillay, P, Bunting, I. and Maassen, P. Universities and economic development in Africa. (Centre for Higher Education Transformation (CHET), 2011)

Bulman, David, Maya Eden and Ha Nguyen (2014). “Transitioning from Low-Income Growth to High Income Growth. Is There a Middle Income Trap?” Policy Research Working Paper No. 7104. World Bank, Washington DC.

Crespo Cuaresma, J. & Lutz, W. (2007). Human Capital, Age Structure and Economic Growth: Evidence from a New Dataset. IIASA Interim Report IR-07-011. Available at www.iiasa.ac.at/Publications/Documents/IR-07-011.pdf.

Commission on Growth and Development. (2008). The Growth Report. Strategies for Sustained Growth and Inclusive Development. Washington DC. IBRD / The World Bank.

De Muro, P. and Burchi, F. (2007). Education for Rural People and Food Security, A Cross Country Analysis. Rome. FAO.

Hanushek, E.A., (2016). Will more higher education improve economic growth? Oxford Review of Economic Policy 32, no. 4: 538-552.

Hanushek, E. A., Schwerdt, G., Wiederhold, S. and Woessmann, L. (2015). Returns to skills around the world: Evidence from PIAAC. European Economic Review 73(January): 103-130.

Hanushek, E. A., Jamison, D. T., Jamison, E. A. and Wößmann, L. (2008). Education and economic growth: it’s not just going to school but learning that matters. Education Next, Vol. 8, No. 2, pp. 62–70. Hanushek, E. and Wößmann, L. 2007. The Role of Education Quality for Economic Growth. Policy Research Working Paper Series 4122. Washington DC. World Bank.

Hanushek, E.A., Schwerdt, G., Wiederhold, S., and Woessmann, L. (2017). Coping with change: International differences in the returns to skills. Economic Letters 153(April): 15-19.

Hanushek, E.A., Schwerdt, G.,, Woessmann, L., and Zhang, L. (2017). General education, vocational education, and labor-market outcomes over the life-cycle. Journal of Human Resources 52, no. 1 (Winter): 48-87.

Hanushek, E. A., and Woessmann, L. (2008). The role of cognitive skills in economic development. Journal of Economic Literature 46, no. 3 (September): 607-668.

Hanushek, E. A., and Woessmann, L. (2012a). Do better schools lead to more growth? Cognitive skills, economic outcomes, and causation. Journal of Economic Growth 17, no. 4 (December): 267-321.

Hanushek, E. A., and Woessmann, L. (2012b). "Schooling, educational achievement, and the Latin American growth puzzle." Journal of Development Economics 99, no. 2 (November): 497-512.

Hanushek, Eric A., and Ludger Woessmann. (2016). "Knowledge capital, growth, and the East Asian miracle." *Science* 351, no. 6271: 344-345.

Hanushek, Eric A., and Ludger Woessmann. (2015b). *Universal basic skills: What countries stand to gain*. Paris: Organisation for Economic Co-operation and Development.

Hanushek, Eric A., and Ludger Woessmann. (2015a). *The knowledge capital of nations: Education and the economics of growth*. Cambridge, MA: MIT Press.

Hanushek, E.A., Woessmann, L. in Dominic J. Brewer and Patrick J. McEwan (2010) Economics of Education, Amsterdam: Elsevier, 2010, pp. 60-67[reprinted in Eva Baker, Barry McGaw and Penelope Peterson (ed.), International Encyclopedia of Education (Amsterdam: Elsevier, 2010), pp. 245-252].http://hanushek.stanford.edu/publications/education-and-economic-growth

IIASA (2008) Economic Growth in Developing Countries: Education Proves Key, Policy Brief #3http://www.iiasa.ac.at/web/home/resources/publications/IIASAPolicyBriefs/pb03-web.pdf

Kautz, T, Heckman, JJ, Diris, R, Ter Weel, B and Borghans, L, (2014). Fostering and measuring skills: improving cognitive and non-cognitive skills to promote lifetime success. The Organisation for Economic Co-operation and Development.https://www.oecd.org/edu/ceri/Fostering-and-Measuring-Skills-Improving-Cognitive-and-Non-Cognitive-Skills-to-Promote-Lifetime-Success.pdf

Greg Larson, Norman Loayza, Michael Woolcock (2016) The Middle-Income Trap: Myth or Reality? Research Policy Briefs From the World Bank Malaysia Hub http://documents.worldbank.org/curated/en/965511468194956837/pdf/104230-REVISED-Revised-RPB-1-Middle-Income-Trap.pdf.

Lockheed, M., Jamison, D., and Lau, L. (1980). Farmer education and farmer efficiency: a survey. In King, T. (ed) Education and Income. World Bank Staff Working Paper 402. Washington DC, World Bank.

Lutz W, Goujon A, KC S & Sanderson W (2007). Reconstruction of populations by age, sex and level of educational attainment for 120 countries for 1970–2000. Vienna Yearbook of Population Research 2007, pp. 193–235. http://hw.oeaw.ac.at.

Lutz W, Crespo Cuaresma J & Sanderson W (2008). The Demography of Educational Attainment and Economic Growth. Science 319(5866):1047–1048. www.sciencemag.org.

Lutz W, Goujon A & KC S (2008). Education: The Key to Development. Options (Summer 2008):12–15. www.iiasa.ac.at/Admin/INF/OPT/Summer08/opt-08sum.pdf.

Pavlova, M (2014) TVET as an important factor in country's economic development, Springerplus**. 2014; 3(Suppl 1): K3.**https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4262679/

Pillay, P. (2011) Higher Education and Economic Development Literature Review. (Centre for Higher Education Transformation (CHET).

Pillay, P. (2010) Linking higher education and economic development: implications for Africa from three successful systems, African Minds Publishers.

Lorna Power, Kerry A. Millington and Stephanie Bengtsson (2015) Building Capacity in Higher Education Topic Guide, HEART http://www.heart-resources.org/wp-content/uploads/2015/09/Capacity-Building-in-Higher-Education-Topic-Guide.pdf?x30250

Psacharopoulos, G. and Patrinos, H. A. (2004). Returns to investments in education: a further update. Education Economics, Vol. 12, No 2.

Psacharopoulos, G. & Patrinos, A. H. (2002) Returns to Investment in Education: A Further Update, The World Bank. http://elibrary.worldbank.org/doi/abs/10.1596/1813-9450-2881

Psacharopoulos, G. (2006) The Value of Investment in Education: Theory, Evidence and Policy. J. Educ. Finance 32, 113–136.

Robertson, Susan, Novelli, Mario, Dale, Roger, Tikly, Leon, Dachi, Hillary and Alphonce, Ndibelema (2007) *Globalisation, education and development : ideas, actors and dynamics.* Researching the Issues vol 68, 2 . DFID. ISBN 9781861928702 http://webarchive.nationalarchives.gov.uk/+/http://www.dfid.gov.uk/documents/publications/global-education-dev-68.pdf

Sparreboom T. & Staneva, A. (2014) Is education the solution to decent work for youth in developing economies? : Identifying qualifications mismatch from 28 school-to-work transition surveys. International Labour Office. Geneva: ILO. http://www.ilo.org/employment/areas/youth-employment/work-for-youth/publications/thematic-reports/WCMS_326260/lang--en/index.htm

Teles, Vladimir Kühl and de Andrade, Joaquim (2004) Public Investment in Basic Education and Economic Growth, SSRN. https://ssrn.com/abstract=573301 or http://dx.doi.org/10.2139/ssrn.573301

Tilak, J. B. G. (2003) Higher Education and Development in Asia. J. Educ. Plan. Adm. XVII, 151–173.

UNDP. (2010). Millennium Development Goals Report 2010. New York.

UNDP. (2010a). What Will It Take to Achieve the Millennium Development Goals? – An International Assessment. New York

UNESCO (2010) The Central Role of Education in the Millennium Development Goals, MDG Summit High-Level Round Table, 22/09/2010, United Nations, New York Secondary education. http://www.unesco.org/fileadmin/MULTIMEDIA/HQ/ED/ED_new/images/education_for_all_international_coordination_new/PDF/analyticalnote.pdf

UNESCO (2012) UNESCO Global Monitoring Report http://unesdoc.unesco.org/images/0021/002180/218003e.pdf

UNESCO (2015) Global Monitoring Report http://en.unesco.org/gem-report/report/2015/education-all-2000-2015-achievements-and-challenges#sthash.PCt2SRTA.dpbs

Woessmann, L (2015) The economic case for education, *Education Economics*, Volume 24.http://www.tandfonline.com/doi/abs/10.1080/09645292.2015.1059801?journalCode=cede20

World Economic Forum (2016) Global Competitiveness Report 2015-2016 http://reports.weforum.org/global-competitiveness-report-2015-2016/education/#view/fn-53

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About this report

This report is based on five days of desk-based research. The K4D research helpdesk provides rapid syntheses of a selection of recent relevant literature and international expert thinking in response to specific questions relating to international development. For any enquiries, contact helpdesk@k4d.info.

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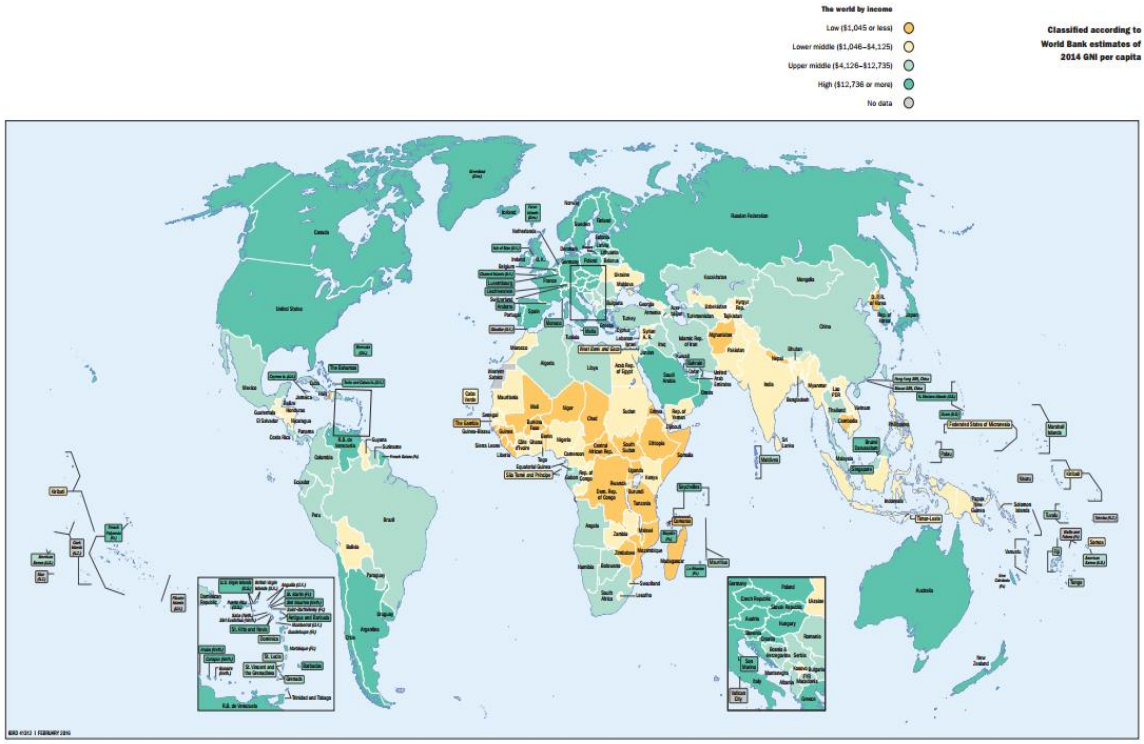
Appendix

World Bank Country Classifications

https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups



LOW-INCOME ECONOMIES ($1,025 OR LESS)

(31)

Afghanistan	Guinea	Rwanda
Benin	Guinea-Bissau	Senegal
Burkina Faso	Haiti	Sierra Leone
Burundi	Korea, Dem. People's Rep.	Somalia
Central African Republic	Liberia	South Sudan
Chad	Madagascar	Tanzania
Comoros	Malawi	Togo

Congo, Dem. Rep	Mali	Uganda
Eritrea	Mozambique	Zimbabwe
Ethiopia	Nepal	
Gambia, The	Niger	

LOWER-MIDDLE-INCOME ECONOMIES ($1,026 TO $4,035)

(52)

Armenia	Kiribati	Solomon Islands
Bangladesh	Kosovo	Sri Lanka
Bhutan	Kyrgyz Republic	Sudan
Bolivia	Lao PDR	Swaziland
Cabo Verde	Lesotho	Syrian Arab Republic
Cambodia	Mauritania	Tajikistan
Cameroon	Micronesia, Fed. Sts.	Timor-Leste
Congo, Rep.	Moldova	Tonga
Côte d'Ivoire	Mongolia	Tunisia
Djibouti	Morocco	Ukraine
Egypt, Arab Rep.	Myanmar	Uzbekistan
El Salvador	Nicaragua	Vanuatu
Ghana	Nigeria	Vietnam

Guatemala	Pakistan	West Bank and Gaza
Honduras	Papua New Guinea	Yemen, Rep.
India	Philippines	Zambia
Indonesia	Samoa	
Kenya	São Tomé and Principe	

UPPER-MIDDLE-INCOME ECONOMIES ($4,036 TO $12,475)

(56)

Albania	Ecuador	Montenegro
Algeria	Fiji	Namibia
American Samoa	Gabon	Palau
Angola	Georgia	Panama
Argentina	Grenada	Paraguay
Azerbaijan	Guyana	Peru
Belarus	Iran, Islamic Rep.	Romania
Belize	Iraq	Russian Federation
Bosnia and Herzegovina	Jamaica	Serbia
Botswana	Jordan	South Africa
Brazil	Kazakhstan	St. Lucia
Bulgaria	Lebanon	St. Vincent and the Grenadines
China	Libya	Suriname

Colombia	Macedonia, FYR	Thailand
Costa Rica	Malaysia	Turkey
Cuba	Maldives	Turkmenistan
Dominica	Marshall Islands	Tuvalu
Dominican Republic	Mauritius	Venezuela, RB
Equatorial Guinea	Mexico	