



The Relationship between Secondary Education and Economic Growth in Sub-Saharan Africa: A Review of the Literature

Lasse Grimmer

To cite this article:

Grimmer, L. (2022). The Relationship between Secondary Education and Economic Growth in Sub-Saharan Africa: A Review of the Literature. Cambridge Educational Research e-Journal, 9, 299-309. <https://doi.org/10.17863/CAM.90569>



Link to the article online: <https://doi.org/10.17863/CAM.90569>



Published online: 30 November 2022



The Relationship between Secondary Education and Economic Growth in Sub-Saharan Africa: A Review of the Literature

Lasse Grimmer

Faculty of Education, Cambridge University

ABSTRACT

Education plays a vital role in a person's life as it provides them with the necessary knowledge, skills and tools needed for the working world later on. With the introduction of the Millennium and Sustainable Development Goals in the 21st century by the international community, more children, especially in Africa, are attending school. With fast-growing economies, such as Kenya and Ghana, and the Sustainable Development Goals' particular focus on secondary education, the relationship between secondary education and economic development becomes fascinating. While most studies on this topic have looked at primary education's association with economic growth, this literature review tries to fill the gap in the academic literature by documenting and analysing the relationship between secondary education and economic growth in Sub-Saharan Africa. A general overview of the field and three detailed case studies are given. In addition, human capital theory is used to explain how people acquire knowledge and use it to their benefit to contribute and be productive in an economy. For this literature review, six major academic research databases have been searched for quantitative studies examining the relationship between education and economic growth in Sub-Saharan Africa. Most studies found a positive association between secondary education, largely proxied through enrolment rates, and national economic growth. This shows that investments in secondary education can boost local economies and provide people with more opportunities. However, more research must be conducted as the quality of education has been neglected in studies examining the relationship between secondary education and economic growth in Sub-Saharan Africa.

KEYWORDS

secondary education, economic growth, human capital theory, Sub-Saharan Africa

Goal two of the Millennium Declaration sets forth that by 2015, universal primary education should have been achieved by all countries worldwide. The declaration was signed in 2000 and set the groundwork for governments and international organisations in helping to achieve educational goals (General Assembly, 2000). In 2015, the Sustainable Development Goals (SDGs) were adopted by 193 countries and laid the foundation for the next 15 years of international development. Education targets were expanded compared to the previous development goals and now include all levels of education and the promotion of life-long learning (General Assembly, 2015). Overall, the SDGs have incorporated a more explicit focus on sustainability and development in all aspects of life. The importance of secondary education and its relationship to economic growth becomes fascinating in the context of Sub-Saharan Africa, where national education policies and international organisations have placed a particular focus on universal primary education for the past two

centuries (General Assembly, 2000). This literature review provides an up-to-date overview of the field. Studies have shown that investments in secondary education demonstrate a clear boost to economic growth (Grant, 2017). Moreover, the returns to secondary education, while not as high as for primary education, are still significant, especially in Sub-Saharan Africa (Psacharopoulos & Patrinos, 2004). Human capital theory is used to explain how education and the accumulation of knowledge in individuals and society contributes to economic growth.

The paper is structured as follows. First, an overview of human capital theory and its critique is given. Second, general quantitative studies are presented on the relationship between education and economic growth. A small general introduction follows this section into secondary education and economic growth. Fourth, cross-country studies focusing on the association between secondary education and economic growth in Sub-Saharan Africa are given. Fifth, Sub-Saharan African country-specific studies are presented and critiqued. This format is chosen as few studies exist on the association between secondary education and economic growth in Sub-Saharan Africa. In addition, analysing cross-country contexts only gives a general direction of what the relationship might be; thus, country-specific contexts are neglected. Looking at country-specific contexts is more accurate as every country is responsible for its education system and economy. Hence, the format, while not being typical for literature reviews, was chosen.

Human Capital Theory

Human capital theory emerged in the 1960s and was mainly coined by Theodore W. Schultz, Gary S. Becker, and Jacob Mincer. The theory proposes that more and better education leads to increased economic growth. Schultz defined education within human capital theory "as an investment in man" (Schultz, 1960, p. 571). He describes education as a form of capital in which individuals can invest time and money to increase their abilities. Becker also sees education as an investment in a person's abilities and describes human capital as "activities that influence future monetary and psychic income by increasing the resources in people" (Becker, 2009, p. 11). He proposed two main drivers for an increased human capital resource base: on-the-job training and schooling. Mincer, also a main contributor of the human capital theory, views education within the framework as "an investment in the stock of human skills" (Mincer, 1974, p. 71). The returns to educational investment are usually accounted for through the income a person receives after their schooling is over and they participate in the economy. Economists often use individual earnings as proxies in their cost-benefit analysis to calculate the returns to education. This ability to see labour differently from before in neoclassical economics was central to the human capital theory (Mincer, 1984).

Critique of the Human Capital Theory

Over the years, multiple scholars have criticised human capital theory and its simple and seemingly elegant calculation of individual productivity within an economy. While many believe in the theory, others contend that multiple variables commonly used in the calculation do not fit the mathematical model. Klees (2016) asserts that using income as a proxy for education is inaccurate since the rates of return to education cannot be fully accounted for without considering other externalities. These externalities can include an individual's socioeconomic background, workplace, or democratic societies. Each of those externalities affects an individual differently, thus making it extremely difficult to calculate a worker's productivity post-education (Klees, 2016). Bowles and Gintis (1975) state that the theory is just another approach to try and quantify labour by assuming that all variables of the theory account for growth. Subsequently, the income a person receives later in life or how they perform during their years in school is influenced by multiple variables which are hard to account for

quantitatively, thus making income, according to Klees (2016), not a suitable proxy for education in the calculation of a worker's productivity (Bradley & Corwyn, 2002).

While the authors mentioned above criticised human capital theory from an individual perspective and argue that it cannot be used to calculate a worker's productivity post-education, others argue that it cannot be used to explain economic growth in higher-educated societies. Marginson postulates that human capital theory "lacks realism" (p.291) and thus cannot be used to explain how education influences economic growth (Marginson, 2019). He argues that human capital theory looks at the relationship between education and economic development from a meta-perspective and thus cannot explain and consider individual factors that explain societal changes. Bowles and Gintis (1975) assess that human capital theory ultimately leaves out the importance of class in a capitalist society and thus cannot be used to account for economic growth as a person's class is important for their productivity in an economy. Contrary to the other authors, Tan, who cites Pritchett's famous *Where has all the education gone?* argues that the theory can account for the fact that education can raise an individual's returns and thus their productivity but cannot be used to calculate societal ones and thus not economic growth.

Nonetheless, human capital theory is frequently utilised in current education policy research, and its theory appears to hold, even though the analytical methodologies used by various writers to evaluate its premise seem to differ significantly (Sweetland, 1996). Hence, in the next section of this essay, various articles are presented and analysed that deal with the general relationship between education and economic growth. These articles explore the relationship on a broad level and present mathematical and cross-country evidence about the association between education and economic growth.

Education and Economic Growth

Education provides a person with more knowledge at their disposal to better participate in society. People can pick up and process new information quicker through higher and better education as well. Multiple authors have tried calculating education's effects on economic growth using various mathematical models. Nelson and Phelps (1966) calculate the implications of new technology through better investment in human capital using different mathematical models. The authors argue that a better-educated person is quicker in picking up tasks and consequently realising innovations faster, resulting in greater returns to education (Nelson & Phelps, 1966). While Nelson and Phelps calculate with a marginal productivity function, Lucas (1988) proposes a new neoclassical growth model in which he assumes that increased human capital will be explicit to the production of precise goods, thus requiring on-the-job training. He states that there is no one-size-fits-all economic growth model since every economy functions differently (Lucas, 1988). Benhabib and Spiegel (1994) argue that a mathematical model failed to deliver a positive relationship between human capital accumulation and economic growth. However, a second model yielded positive results. Both authors pick up the argument of Nelson and Phelps and discuss the mechanism of faster adoption of new technologies through better human capital as an instrument for increasing economic development (Nelson & Phelps, 1966). Although these sources are dated, these sentiments still hold.

Other general studies looked at big datasets and performed cross-country analyses on the relationship between education and economic growth. As mentioned earlier, authors use various analytical approaches to measure how human capital impacts economic growth (Sweetland, 1996). Although the literature is torn on the impact of schooling on economic growth, each study adds valuable insight to the conversation. In large-scale, cross-country studies, researchers found a positive connection

between education and economic growth. In a study involving 98 countries, Barro (1991) found that school attainment, which he used as a proxy for human capital, is positively linked to real GDP per capita growth rates.¹ On the other hand, Bils and Klenow (2000) analyse the same dataset and conclude that the impact on growth through schooling justifies less than one-third of all cross-country relationships. Breton (2013) analyses education's direct and indirect effects on national output,² finding that education raises the productivity of an individual and others, thus contributing positively to the economy.

While the authors above find a positive relationship between education and economic growth, other authors have not confirmed this association. After conducting multiple cross-country analyses, Pritchett argues that educational attainment has no positive impact on subsequent output per worker (Pritchett, 1996, 2001).³ He acknowledges that these results display the average relationship between education and economic growth in multiple countries and proposes three potentialities for countries that have seen improvements in education but not subsequent economic growth. The most prominent is that in some education systems, an additional year of schooling did not result in the acquisition of new skills. Hence, the quality of education targeted by the SDGs in 2015 was insufficiently supported by local and national authorities (General Assembly, 2015).

Most studies have neglected the quality of education in their studies. All of the studies mentioned above-proxied education with a quantitative variable (e.g., years of schooling) and left out the quality of education, which is an essential factor in calculating the returns to education since only attending school does not equal learning. Hence, looking at the general reflections on the relationship between education and economic growth, the quality of schooling was often disregarded and not considered.

Hanushek and Woessmann (2008) argue that school attainment is not guaranteed to increase economic growth. Both authors claim that cognitive skills rather than school attainment are positively linked to individual earnings. While cognitive skills are a person's abilities to do something (e.g., learn, think, justify), school attainment is the highest level of education a person has achieved. Results show a positive relationship between annual GDP per capita and a higher cognitive skilled workforce. In addition, Hanushek and Woessmann assert that new technologies can be adapted quicker through better cognitive skills, leading to better production processes and, ultimately, more output (Hanushek & Woessmann, 2008, 2012). These results connect to Nelson and Phelps's mathematical model, which shows that faster adoption of new technologies is positively linked to economic growth (Nelson & Phelps, 1966). Hence, both authors support the notion that the quality of education rather than quantity is associated with higher economic growth. While general mathematical and cross-country studies on the relationship between education and economic growth indicate a possible impact, it is crucial to study country-specific evidence, as every country is responsible for its own education system and has its own economy. Therefore, the next part of the article provides specific literature on the relationship between secondary education and economic growth in Sub-Saharan Africa.

1 Gross domestic product (GDP) is the value of all goods and services that were added in a country during a certain period (usually one year). Real GDP, compared to nominal GDP, is adjusted for inflation and per capita means that the GDP was divided by the amount of people who live in that particular country (Rosa, 2017).

2 National output is the value of all goods and services manufactured and sold during a particular period (usually one year) (Schaffer, n.d.).

3 Output per worker is another measure of productivity and is defined as how much one person can produce in a given time period.

Method

For the specific literature part of this essay, the British Education Index, the Education Resources Information Centre, Scopus, Web of Science, Google Scholar, and the African Education Research Database were searched. Keywords used in the search were "secondary education" OR "high school" OR "secondary school" AND "economic growth" OR "economic development" OR "economic impact" AND "low-income country" OR "developing country" OR "Africa". Most articles include mathematical and econometric analyses of the association between education and economic growth. The next section will critically review and analyse the specific literature.

Secondary Education and Economic Growth in Sub-Saharan Africa

Secondary education provides children with more knowledge and resources that they can later use to advance into tertiary education or enter the job market. Being able to advance into higher grades or enter the job market depends on various factors. These include attending preceding schools, skills acquisition during their time in school or outside, availability of jobs, and the quality of teaching. After the Millennium Goals were adopted, many countries, especially in Africa, focused on increasing enrolment rates for children at the primary level (General Assembly, 2000). This focus resulted in an increase in primary school attainment throughout the continent. However, multiple factors played a role in why children did not advance to higher levels of schooling in Sub-Saharan Africa. The quality of learning was often disregarded, and thus children did not learn the knowledge and skills necessary to enter secondary school. In addition, the unavailability of secondary schools and school fees for higher levels of education played a significant role in children not advancing into higher grades. The SDGs focus on successfully completing primary and secondary school until 2030 (General Assembly, 2015). Completing secondary school has a significant impact on a person's life. It can lift them into a better position for obtaining a job and an increased income in the future. Therefore, the next section is structured as follows. First, cross-country studies examining the relationship between secondary education and economic growth in African countries are presented. Second, three studies focusing on particular countries in Sub-Saharan Africa are analysed and critiqued. This format is chosen as cross-country studies give a general overview of the association between education and economic growth. These studies are followed by a more focused approach to individual countries and their relationship between secondary education and economic growth thereafter.

Cross-Country Studies

A country's investment in secondary education can significantly impact its future economic growth. Gyimah-Brempong (2011) investigates the economic impact of different stages of development in Africa. He concludes that secondary education is significantly and positively related to income growth rates per capita. Countries in Africa have one of the lowest school attainment rates globally, especially at the higher levels of schooling. The economic impact would be enormous if education systems provided more people with learning opportunities after primary school. However, Gyimah-Brempong only shows average results for the African continent and not for specific countries or regions within Africa. In addition, he did not consider the quality of schooling in his analysis. Nonetheless, he acknowledges that a lower student-to-teacher ratio could yield even higher educational returns than increased school attainment alone (Gyimah-Brempong, 2011). In a different study by Basten and Cuaresma, both authors calculate the economic impact of three educational investment strategies in Africa. Calculations incorporate primary, secondary, and tertiary education levels. Data comes from the projection of the educational attainment database from KC et al. (2010). Model one runs with constant enrolment numbers in pre-tertiary education. Model two calculates with constant enrolment rates and model three with increasing enrolment numbers. According to Basten and Cuaresma's

projections, increasing investment in pre-tertiary enrolment rates, especially secondary education, would yield significant economic growth for lower-developed countries in Africa by 2040. Lower-developed countries profit more from investment in education because they can catch up more than countries with an already existing high human capital base. However, only investing in increasing enrolment rates might not lead to the desired outcome for policymakers. Basten and Cuaresma do not consider the importance of quality of education, which has been of focus for many countries after the SDGs were adopted in 2015 (Basten & Cuaresma, 2014; General Assembly, 2015). While increasing the number of students who go to school is necessary and good, investments in the quality of education should equally be made to ensure that students gain knowledge and skills.

Deme and Mahmoud (2020) consider this in their study of the effect of education quality and quantity on economic growth in developing countries in Africa. The quantity of education is measured through primary and secondary school enrolment rates, while the quality of education is measured through published journal articles and GRE scores of students wanting to attend higher education. Results show that the quantity of education substantially impacts real GDP per capita. Interestingly, primary school enrolment rates have a stronger association with economic growth than secondary school enrolment rates (Deme & Mahmoud, 2020). An explanation for this phenomenon could be that the skills acquired by the students in primary school matched the jobs available in the economy. Another interesting result shows that the quality of education, measured through GRE scores and published journal articles, failed to deliver its promise and showed a weaker association with economic growth than the quantity of education. These results could be because published journal articles per capita do not reflect the skills acquired by primary and secondary students in low-income countries in Africa. Published journal articles reflect the degree to which university personnel conducts research in a country. In addition, only a few selected people research and publish articles compared to a significantly higher number enrolled in primary and secondary education (Deme & Mahmoud, 2020).

On the other hand, one could argue that primary and secondary schooling prepares students with the necessary skills to enter tertiary education and become researchers. However, it would be wiser to use a proxy closer to the end of primary and secondary school to measure the quality of education rather than one after another step of education and formal training. Another proxy that Deme and Mahmoud use to measure education quality is GRE scores. Undergraduate students sometimes complete the Graduate Record Examination (GRE) in their final year to apply to graduate school since many graduate programs worldwide require the test as part of their admission portfolio. The GRE test measures the test taker's analytical writing, verbal reasoning, and quantitative reasoning abilities, thus covering the mathematical and reading skills of the student. However, Deme and Mahmoud report that the data on the GRE tests does not include all countries in their sample size. In addition, only a tiny number of students in their final year of undergraduate studies took the GRE test, making the sample size too small to include in the regression analysis and questioning the effect of the quality of education on economic growth in African countries.

In a different study, Angrist et al. (2021) place a particular emphasis on measuring the effect of the quality of education or skills acquired during schooling on economic growth in various regions worldwide. In their regression model, Angrist et al. (2021) use a different method than other researchers, accounting for better and more reliable education quality variables in the human capital equation. By using regional test scores and international assessments, the authors can portray an enhanced picture of the quality of education in multiple countries globally. Results show that learning (quality of education) drastically increases annual economic growth. While two-thirds of the countries in the

sample are developing nations, countries with high inflation rates and conflict regions are excluded from the analysis.

Other cross-country studies in educational economics looked at reducing gender inequality in secondary school. Increasing the number of girls who complete pre-tertiary education significantly affects subsequent economic growth (Wodon et al., 2018). Klasen (2002) investigates the association between gender inequality and economic development in low-income regions worldwide, and his study shows that gender inequality harms economic growth. Interestingly, gender inequality in education has a more significant effect on economic growth in Sub-Saharan Africa than in other low-income regions. While having more girls complete secondary school not only results in higher economic returns, girls' education also indirectly affects multiple other parts of society, such as improved health (Smith et al., 2016).

While all the cross-country studies above focused entirely or partly on Africa or Sub-Saharan Africa and portrayed a positive relationship between secondary education and economic growth, Biao (2018) comes to a different conclusion. He examines the relationship between educational attainment and economic development in Sub-Saharan Africa in the 21st century and concludes that education in Africa failed to yield the results promised and did not result in higher economic growth over the past centuries. Biao (2018) argues that the various education systems in Africa stem from the colonisation era, and thus "schooling" and "learning" are implemented through a western approach and local contexts are not taken into account. However, he does not provide any solutions to this problem but merely asks questions to help answer it. The continent of Africa is one of the most diverse regions on earth and differs drastically from Western countries. An education system that has been proven to work in the Western hemisphere may not work in these environments as each context is vastly different (Brock, 2013). Thus, looking at local and regional settings is essential to creating an education system that works for people on site. Therefore, in the following subsection of the essay, three studies are presented, focusing on particular countries in Sub-Saharan Africa.

Country-Specific Studies

Ghana

Adu and Denkyirah (2017) look at the different impact levels of schooling on Ghana's economic growth between 1980 and 2016. Findings show that secondary education has a significant positive relationship with economic growth, but only in the long run. However, it must be said that Ghana experienced a series of fluctuations in its GDP per capita and high inflation rates during this time. In addition, Ghana experienced an economic decline between 1981 and 1983. Thus, growth rates afterwards are higher. Nonetheless, Adu and Denkyirah (2017) estimate that a one percentage point increase in secondary school enrolment rates in Ghana would lead to a five percentage point increase in GDP per capita. While both authors look mainly at the relationship between school enrolment rates and economic growth, they also provide evidence of the association between the quality of education and economic growth. Adu and Denkyirah (2017) use government expenditure as a proxy for the quality of education. Results indicate a negative, statistically insignificant relationship between those two variables. Using government expenditure as a proxy for the quality of education is problematic because the authors cannot ensure that everything the government allocates in its education budget also goes towards the quality of education. Proxying the quality of education with either literacy rates or standardised test scores would be a better variable and closer to students' abilities. However, both authors acknowledge that the government in Ghana should work more closely on improving the quality of education rather than trying to increase the enrolment rates.

Ethiopia

Reinikka (2013) provides an interesting argument in her book chapter *"The Place of Secondary Education in an Economic Transformation Strategy"*. Here she explores the policy implications needed in Ethiopia to advance its economy towards a low-middle-income country. Her study mainly focuses on the skills required at every educational level and cites that countries where most people only graduate from primary school and do not advance into secondary school can only experience so much growth until a particular point when the economy requires better and higher skills. Reinikka (2013) argues that the focus of Ethiopia's education policy should be on the expansion of secondary education both in its access (quantity) and skills acquired (quality) by the students to meet the demands of the changing economy. While targeting the quantity of education and bringing more children into school might be an excellent short-term resolution to increase the human capital base of a country, governments should not ignore the fact that the quality of education is crucial in the end so that the children learn and improve their skills. In addition, Reinikka (2013) asserts that Ethiopia should emphasise the options students should have after graduating from secondary school. They are either continuing with tertiary education or entering the job market to receive on-the-job training through their employer. Either way, students contribute more to the economy than only a primary education degree. Of course, this is only true if the economy provides such jobs.

Malawi

Smith et al. (2016) investigate the relationship between education, health, and economic growth in Malawi. Using the Malawian Third Integrated Household Survey, which spans from 2010 to 2011, the authors show that education indirectly affects economic growth from better health. The authors predict that individuals could increase their annual wage by more than 136 percentage points by completing secondary school. Earning more money would result in individuals paying higher taxes, which could be invested in educational programs across the country. In their calculation model, Smith and colleagues assume job opportunities are present for recent graduates of secondary schools in Malawi. However, Smith et al. (2016) do not consider education quality in their analysis. A significant part since student-teacher ratios in Malawi is among the highest in Sub-Saharan Africa. Hence, by improving the quality of education through lower student-teacher ratios, the impact on economic growth could be even more significant than calculated by the authors (Smith et al., 2016).

Conclusion

This literature review tries to fill the gap by providing an overview of the existing yet rare literature on the relationship between secondary education and economic growth in Sub-Saharan Africa. Education profoundly impacts an individual's life and society as a whole. With better and more education, people can build a greater future for themselves and those around them. A higher human capital base enables economies to be more productive and compete better in the international market. A better-educated workforce leads to higher economic growth and individuals having more opportunities. In Sub-Saharan Africa, education systems are notoriously underfunded, and enrolment rates are far behind the standard of industrialised countries. Multiple studies have shown that increasing enrolment rates at the secondary school level in Sub-Saharan Africa contributes to economic development. Secondary education provides students with the knowledge and skills necessary to participate in a developing economy and contribute to national output. While most studies focus on analysing the effect of increasing enrolment rates on economic growth, only some focus on improving the quality of secondary education to achieve the same. In addition, while cross-country studies analyse the relationship between education and economic growth on a broad level, more studies must be conducted to investigate the effect of secondary education, particularly the quality of education, on economic

development in countries in Sub-Saharan Africa. Through the diversity of countries in Sub-Saharan Africa, it is essential to pay attention to local contexts and the people when trying to implement new policies to improve secondary education and increase economic growth.

References

- Angrist, N., Djankov, S., Goldberg, P. K., & Patrinos, H. A. (2021). Measuring human capital using global learning data. *Nature*, 592(7854), 403–408. <https://doi.org/10.1038/s41586-021-03323-7>
- Barro, R. J. (1991). Economic Growth in a Cross Section of Countries. *The Quarterly Journal of Economics*, 106(2), 407–443. <https://doi.org/10.2307/2937943>
- Basten, S., & Cuaresma, J. (2014). Modelling the macroeconomic impact of future trajectories of educational development in Least Developed Countries. *International Journal of Educational Development*, 36, 44–50. <https://doi.org/10.1016/j.ijedudev.2013.12.003>
- Becker, G. S. (2009). *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. University of Chicago Press.
- Biao, I. (2018). Supplying Basic Education and Learning to Sub-Saharan Africa in the Twenty-First Century. *World Journal of Education*, 8(2), 181–190.
- Bils, M., & Klenow, P. J. (2000). Does Schooling Cause Growth? *American Economic Review*, 90(5), 1160–1183. <https://doi.org/10.1257/aer.90.5.1160>
- Bowles, S., & Gintis, H. (1975). The Problem with Human Capital Theory—A Marxian Critique. *The American Economic Review*, 65(2), 74–82.
- Bradley, R. H., & Corwyn, R. F. (2002). Socioeconomic Status and Child Development. *Annual Review of Psychology*, 53(1), 371–399. <https://doi.org/10.1146/annurev.psych.53.100901.135233>
- Breton, T. R. (2013). The role of education in economic growth: Theory, history and current returns. *Educational Research*, 55(2), 121–138. <https://doi.org/10.1080/00131881.2013.801241>
- Brock, C. (2013). *Education around the world: A comparative introduction*. Bloomsbury. https://cam.ldls.org.uk/vd-c_100096748485.0x000001
- Deme, M., & Mahmoud, A. M. A. (2020). Effect of quantity and quality of education on per capita real-GDP growth: Evidence from low- and middle-income African countries. *Applied Economics*, 52(57), 6248–6264. <https://doi.org/10.1080/00036846.2020.1789058>
- General Assembly. (2000). *United Nations Millennium Declaration*. United Nations. <https://undocs.org/en/A/RES/55/2>
- General Assembly. (2015). *Transforming our world: The 2030 Agenda for Sustainable Development*. United Nations. <https://undocs.org/en/A/RES/70/1>
- Grant, C. (2017). *The contribution of education to economic growth*. 25.
- Gyimah-Brempong, K. (2011). Education and Economic Development in Africa. *African Development Review-Revue Africaine De Developpement*, 23(2), 219–236. <https://doi.org/10.1111/j.1467-8268.2011.00282.x>
- Hanushek, E. A., & Woessmann, L. (2008). The Role of Cognitive Skills in Economic Development. *Journal of Economic Literature*, 46(3), 607–668. <https://doi.org/10.1257/jel.46.3.607>
- Hanushek, E. A., & Woessmann, L. (2012). Do better schools lead to more growth? Cognitive skills, economic outcomes, and causation. *Journal of Economic Growth*, 17(4), 267–321. <https://doi.org/10.1007/s10887-012-9081-x>
- KC, S., Barakat, B., Goujon, A., Skirbekk, V., Sanderson, W., & Lutz, W. (2010). Projection of populations by level of educational attainment, age, and sex for 120 countries for 2005-2050. *Demographic Research*, 22, 383–472.
- Klasen, S. (2002). Low Schooling for Girls, Slower Growth for All? Cross-Country Evidence on the Effect of Gender Inequality in Education on Economic Development. *World Bank Economic Review*, 16(3), 345–373. <https://doi.org/10.1093/wber/lhf004>
- Klees, S. J. (2016). Human Capital and Rates of Return: Brilliant Ideas or Ideological Dead Ends? *Comparative Education Review*, 60(4), 644–672. <https://doi.org/10.1086/688063>

- Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22(1), 3–42. [https://doi.org/10.1016/0304-3932\(88\)90168-7](https://doi.org/10.1016/0304-3932(88)90168-7)
- Marginson, S. (2019). Limitations of human capital theory. *Studies in Higher Education*, 44(2), 287–301. <https://doi.org/10.1080/03075079.2017.1359823>
- Mincer, J. (1974). *Schooling, experience, and earnings / Jacob Mincer*. NBER.
- Mincer, J. (1984). Human capital and economic growth. *Economics of Education Review*, 3(3), 195–205. [https://doi.org/10.1016/0272-7757\(84\)90032-3](https://doi.org/10.1016/0272-7757(84)90032-3)
- Nelson, R. R., & Phelps, E. S. (1966). Investment in Humans, Technological Diffusion, and Economic Growth. *The American Economic Review*, 56(1/2), 69–75.
- Pritchett, L. (1996). Where has all the education gone? In *Policy Research Working Paper Series* (No. 1581; Policy Research Working Paper Series). The World Bank. <https://ideas.repec.org/p/wbk/wbrwps/1581.html>
- Pritchett, L. (2001). Where Has All the Education Gone? *World Bank Economic Review*, 15(3), 367–391.
- Psacharopoulos, G., & Patrinos, H. A. (2004). Returns to investment in education: A further update. *Education Economics*, 12(2), 111–134. <https://doi.org/10.1080/0964529042000239140>
- Reinikka, R. S. (2013). The Place of Secondary Education in an Economic Transformation Strategy. In *Secondary Education in Ethiopia: Supporting Growth and Transformation* (pp. 41–57). World Bank Inst. <https://www.webofscience.com/wos/woscc/full-record/WOS:000323752500004>
- Rosa, W. (Ed.). (2017). Goal 8. Promote Sustained, Inclusive, and Sustainable Economic Growth, Full and Productive Employment, and Decent Work for All. In *A New Era in Global Health*. Springer Publishing Company. <https://doi.org/10.1891/9780826190123.0019>
- Schaffer, D. L. (n.d.). *ECONOMICS 104 PRINCIPLES OF MACROECONOMICS. 2*.
- Schultz, T. W. (1960). Capital Formation by Education. *Journal of Political Economy*, 68(6), 571–583.
- Smith, W. C., Ikoma, S., & Baker, D. P. (2016). Education, health, and labor force supply: Broadening human capital for national development in Malawi. *Cogent Education*, 3, UNSP 1149041. <https://doi.org/10.1080/2331186X.2016.1149041>
- Sweetland, S. R. (1996). Human Capital Theory: Foundations of a Field of Inquiry. *Review of Educational Research*, 66(3), 341–359. <https://doi.org/10.3102/00346543066003341>
- T. Adu, D., & Denkyirah, E. (2017). Education and economic growth: A co-integration approach. *International Journal of Education Economics and Development*, 8, 228. <https://doi.org/10.1504/IJEED.2017.10009612>
- Wodon, Q., Montenegro, C., Nguyen, H., & Onagoruwa, A. (2018). *Missed Opportunities: The High Cost of Not Educating Girls*. World Bank. <https://doi.org/10.1596/29956>