

The Relationship between efficiency of education and economic development: A comparative study

Hoda Abd El Hamid Ali

Faculty of Commerce and Business Administration
Future university in Egypt, Egypt

Hajar Tarek Mahmoud

Senior Economic Researcher
Influence Communications, Egypt

Keywords

Efficiency, Education, Economic Development, Sustainability, Theories of Efficiency, Sustainable Development Goals, Determinants of Efficiency, Economic Development theories, Efficiency Measures, Input and Output Efficiency system.

Abstract

In the last years governments are working towards improving their economic development stance among countries, while also working on achieving their set sustainable development goals in different sectors. One of those sectors that plays a vital role in enhancing and improving economic development ranks is education. However, countries are not paying enough attention on improving and developing their education system through neither increasing their spending on developing and improving their education sector nor paying attention on assessing their efficiency performance in education. Therefore, the aim of this paper is to study the impact of efficiency of education on economic development through on selected Asian and North African countries from the period of 2000-2021. In which the results of this study have showed that the efficiency of education determinants has a positive impact on spurring economic development. The outcomes of the study have also indicated that the countries who recorded higher efficiency of education and thus higher economic development rate are the countries that are concentrated in Asia. On the other hand, North African countries had low rates of education efficiency and lagged behind in the economic development ranks compared to Asian Countries this was due to the characteristics of their education system which was acknowledged by being underdeveloped infrastructure, traditional learning tools, and low government spending.

Introduction

Currently countries are increasing their investment in education sector each year to enhance and improve their economic development ranks, since education plays a crucial role in promoting economic development (Glewwe et al 2014). However, countries are mainly focusing on increasing their spending on education while paying less attention on assessing their efficiency performance in education.

Efficiency can be described as the optimal use of resources to obtain the maximum output from these allocated resources, while ensuring that this process promotes economic growth and development (Lavado and Cabanda 2009). Therefore, input-output efficiency is a crucial analysis to evaluate their education spending effect on efficiency performance and economic development.

However, developing countries experienced almost no critical development throughout the past years. Therefore, most developing countries formulated its national long-term vision, which encompassed setting a new strategy for all sectors in the economy including education system that aims at improving the learning and teaching conditions, ensuring equal access to education, promoting high quality of education, and introducing digital and advanced learning tools (World Bank, 2019).

Since education is one of the drivers of economic development, investing and developing in the education sector that based on equal access to education with a good education quality and an efficient implementation system can promote economic efficiency and development.

It is worth mentioning that there are very few studies that have tackled specifically the concept of "Efficiency of Education" in relationship to "Economic Development". Even the couple of studies that

analyzed the impact of efficiency of education on economic development neglected and didn't take into consideration developing countries as part of their study sample especially the Middle East and North Africa region, while focused mainly on developing countries.

Thus, this study aimed at bridging the gap in literature and focusing on measuring and assessing the relationship between efficiency of education and economic development and especially across developing countries in the North African Countries and compare their performance with Asian countries. Accordingly, the study has employed the panel regression model across selected 10 countries from the African and Asian Countries in order to assess the relationship between the efficiency of education and Economic development.

2. Theoretical Overview of Theories and Objectives of Economic Development

Economic development throughout the past years have gone through many changes and was assessed from many angles in order to capture what is really meant by economic development and how can countries achieve economic development. Many scholars have agreed that economic development process is a "Multidimensional Process" that takes into consideration several factors in order to achieve economic development. Accordingly, this chapter will present the literature review of the history of economic development concept, theories, goals, and measures throughout the past years and until present. In which the first section of this chapter will introduce the different definitions and concepts of "Economic Development" according to prominent economists. Then the second section will present the evolution of economic development theories. Finally, the third section will move towards a more capturing and concrete measure which aims at introducing the transitional phases of Economic development goals, its measures and Indicators.

2.1 Defining "Economic Development" Concept

The term "Development" throughout the history had various perspectives and definitions, since many economies had difficulties in identifying a concrete and fixed definition for the term "Development". This caused economists to start defining the term "Development".

Before the 1950s, traditional economies defined and conceptualized development as "The process of achieving "a sustained income per capita growth rates" to allow nations to achieve higher output growth rate" (Todaro and Smith 2011). Traditional economies at that time perceived development from a very narrow standpoint and solely focusing on one dimension of development which is achieving persistent income per capita growth rate, while neglecting economic development issues and factors that are included in the development process such as, income distribution, poverty, and unemployment.

During the 1950s until 1960s, economies has started to realize that they achieved the targeted income per capita growth rates, yet economic issues such as poverty, unemployment, and income distribution weren't solved, and the standard of living remained unchanged (Maryann Feldman 2014). This caused economies to question the traditional concept of economic development and the concept of "Trickle Down Effect" and recognize the traditional development concept as being a very narrow definition of development. In the 1970s, Dudley Seers stressed on considering other development dimensions in achieving economic development and not to solely rely on achieving high income per capita growth rate. In 1980 and 1990s, the developing economies deteriorated in which Denis Goulet urged economies to start perceiving the process of economic development as a "Multidimensional Process" in order to overcome these harsh economic obstacles.

During 1998, the eminent economist and Nobel Prize winner, Amartya Sen introduced an intellectual shift in perceiving the development concept in which he focused on two new angels in the development process which highlights that individuals are the core focus in economic development and that development is a "Multidimensional Process". The concept and approach of "Capability to function" which he highlights as a very crucial element in achieving development. Amartya Sen believed that focusing on "Output" as traditional economies believed isn't sufficient to achieve development (Jon Hall & John Helliwell 2014) and that the availability of commodities in the economy as a result of focusing on increasing output level is useless, unless an individual has the "Capability to functioning" and can make use of these commodities or services according to the characteristics these individuals hold.

This multidimensional process that takes into consideration the enhancement of more than one factor beside income, will consequently achieve economic development since the main objective of economic development is achieving a better standard of living for individuals through improving the above-mentioned factors (Hoda Ali 2018).

In all the previous eras, development was conceived as the process that aimed at achieving a better standard of living for individuals. The question of what exactly constitute a better standard of living drove economists to define the three core values of development that achieve a better standard of living which include: Sustenance, Self-Esteem, and Freedom of Servitude (W.Arthur Lewis).

2.2 A Close Eye on: The evolution of Economic Development Theories

Economic development theories have undergone progress and development throughout the past years, in which these theories can be classified into two main categories which is the classical and modern economic development theories. After the Second World War, classical economic development theories began to focus on developing countries regarding how they can achieve economic development. In which these theories have mainly relied on four main approaches. Each approach has presented a distinguished perceptions and channels of how to achieve development.

During the 1950s and 1960s, economists believed that in order for a developing country to achieve economic development and transform into a developed country, they need to undergo the same process that developed countries have gone through back then when they were developing countries. In addition, developing countries must also transform from being heavily relying on primary agricultural sector and to start focusing on developing their industrial sector which unlike the agricultural sector, causes an increasing rate of growth. These assumptions were derived from the Linear Stages of Growth Models which were well-known by the two main theories: Rostow stages of Economic Growth and Harrod-Domar Growth Model.

In the 1970s, the rise of the Structural Changes Models came to take into consideration the structural and institutional differences that were neglected in the linear stages of growth model. In which the structural changes models assumed that in order for the under developing economy to grasp the amount of capital formation and investment to achieve economic growth, it needs to change its economic structural and institutional framework (Mario Coccia 2019). However, structural changes models also considered economic growth as an important factor of development. However, it believed that in order for developing countries to achieve economic development, they need to transform from being an agriculture-based economy to an industrialized economy.

After the structural change models, came the International Dependency Theories which were inspired by Marx's Ideology and gained a lot of attention and support from the developing countries (Osakue Omoera 2019). These theories focused on the constraints that the developing countries face and how it can tackle these constraints rather than presenting a process of development. These constraints were both international and domestic constraints. In addition to, the lower level of capital formation in which the developing countries encounter and accordingly hamper them from achieving development. These constraints are the economic, institutional, and political structure that the developing countries obtain. In addition, these models tend to encourage closed economy to achieve development, since they advise less dependency of the developing countries on developed countries. However, the International Dependency Theories, the models don't provide the information on how can developing countries achieve development.

In the 1980s, The Neoclassical Counter Revolution approach appeared in the 1980s with a total opposing ideology to that of International Dependence Revolution theories (Łukasz Piętak 2014). The neoclassical counter revolution school gained the attention and the support from the developed countries and international organizations. In contrast to the International Dependence Revolution theories, the Neoclassical counter revolution approach called for promoting "Free competitive markets" and that the developing countries must transform from relying on closed economies and to start to open and free their markets in order to attract domestic and foreign investments, increase capital accumulation, and accordingly achieving economic development and growth.

The Modern Theories of Development during the late 1990s started to perceive development as a more challenging process to be obtained and that development process encounters more barriers

compared to previous eras. In which, it sheds lights on the negative consequences of being an open economy and the importance of government intervention in achieving development.

3. Efficiency in Education : Concept and Determinates

3.1 The Concept of Efficiency

Throughout the literature review it happens to be that there are many scholars and economists who were interested in the “Efficiency” concept and tried to define it. The most well-known economist whose name was associated directly with efficiency is the Italian economist Pareto who developed a formulation of efficiency concept known as “Pareto Efficiency or Optimization.” According to Pareto, efficiency is related to the “Distribution of Resource or Resources Allocation” which can be applied when studying the efficiency of the producer, the consumer, or the economy as a whole. Pareto perceived “Efficiency” as the state at which an economy is optimizing all its resources to meet generations’ needs and that resources are being efficiently allocated to ensure that a consumer is satisfied without decreasing the satisfaction of another consumer (Griffiths and Wall 2000).

Peter Drucker referred to efficiency as “Doing Things Right” and focused in his definition on the aspect of activities and inputs that determine efficiency. The Asian Productivity Organization provides a similar definition of Efficiency as: “Doing things right at the right time, in the right place, and by qualified people.” Thus, efficiency is concerned with doing business with being economic oriented in terms of effort, time, labor and money (Simpas , Garcia and Ramiro 1981).

Achabal and Chan in their definition of efficiency they focus on inputs. In which Achabal believes that efficiency refers to “An organization’s ability to allocate resources and reduce costs to a minimum.” On the other hand, Chan defines efficiency as “The optimal use of resources in a way that saves money and time, thus improving the organization’s performance. In other words, Chan sees efficiency as the “ratio of the resources expected to be used, and those that have actually been used (Ibid).

Both Lusthaus et al. and Amitai Etzioni elaborated more on the efficiency definition of “Sumanth” in terms of the relationship between input and output. Amitai Etzioni defines efficiency as “The number of resources used to produce one unit of output” while Lusthaus et al defines efficiency as “The organization’s ability to achieve desired results through the optimal use of the resources available.”

3.2 The Progress of Economic Development Goals & Determinants of the Efficiency of the Education Sector

By time, some incidents have emerged that grabbed the attention of not only scholars but also the international community to start critically think of how these incidents may affect our lives, the future generation’s resources and its importance in achieving economic development. These incidents were more vivid during the industrial revolution when economies witnessed growth and development in production which led to depletion of natural resources that negatively impacted economies (Kates and Parris 2003).

In which many countries started to notice the importance of preserving our natural resources. In parallel, other problems such as poverty, inequality, food and energy shortages, literacy, unemployment and health have augmented and persisted, causing lower economic growth rates and hampering economic development. This urged countries to start looking for a way that can solve these persistent issues and to start reanalyzing their stance in the ecosystem and look for new long-term plans that preserve resources for the current and future generations (Longyu , Linwei , Fengmei ,& Lijie 2019) and to start to have a concrete measure, goals, and means to economic development.

International Organizations started introducing the Millennium Development Goals as a mandate for countries to follow. The MDGs include eradicate extreme poverty and hunger, achieve universal primary education, promote gender equality and empower women, reduce child mortality, improve maternal health, combat HIV/AIDS, malaria, and other diseases, ensure environmental sustainability and develop a global partnership for development. Later on, the concept of sustainability was introduced by the United Nations in 2015 through achieving “Sustainable Development Goals” by 2030. The SDGs goals consist of 17 goals as that include: No Poverty, Zero Hunger, Good Health and Well-being, Gender Equality ,Clean Water and Sanitation, Affordable and Clean Energy, Decent Work and Economic Growth, Industry, Innovation and Infrastructure, Reduced Inequality , Sustainable Cities and Communities,

Responsible Consumption and Production, Climate Action, Life Below Water, Life on Land, Peace and Justice, Strong Institutions, and Partnerships to achieve the Goal, and Quality of Education.

Since Education became a required dimension to achieve sustainable development goals set by the United Nations in which countries must abide by and work towards. Accordingly, governments invest heavily in human capital development through education and since it will contribute positively to the country's economic, social, and environmental levels in which according (Fabrizio Carmignani 2016), An educated person who is enlightened and knowledgeable will be able to add value to the economy through his productivity and acquired skills, while helping the surrounded communities and fitting more easily in the society.

While governments around the world have started to expand their dedicated budgets to enhance and develop their education sector, they came at a point where they need to start assessing how "Efficient" is their investments and public expenditure they are spending on the education sector since most countries are looking forward to increase their efficiency level of these investments which became a goal where several countries are trying to reach.

In order to analyse the efficiency level of education, we need to understand how efficiency can be reflected and applied in the education sector. In other words, what determines efficiency of education? Since the common factor between almost all definitions of "Efficiency" is the inputs and outputs relationship to achieve efficiency, so will be the determinants of efficiency of education. According to the literature, the determinants of efficiency of education can be classified into inputs and outputs.

The most common determinates of efficiency in the education sector which constitute the most commonly used inputs and outputs of the education system is Public Expenditure "Monetary Input": Public expenditure is considered one of the most important inputs of the education system. Basically, it is how much does a government spend on the education sector in order to provide it with all its needed facilities, services, and utilities to improve and develop it. It is worth mentioning that public spending or expenditure on education is one of the necessary variables being used by researchers to measure efficiency in the education sector (Cuellar 2014).

Classes Size is a non-monetary education input used to measure efficiency of the educational system. A crowded classroom will hamper teacher to provide equal attention to the large number of students and recognize the individual differences between students, while making it difficult for students to comprehend the lessons conducted by teachers(Cuellar 2014).

Also known as the Students/Teacher ratio is another important indicator and efficiency input of the educational system. This ratio is the number of students or share of students allocated for a teacher. The less the share of students allocated for a teacher, the more the teachers are giving more attention to the students and thus the higher the probability of education achievement (Afonso and Aubyn 2006).

The physical condition of schools is one of the determining factors for the success or failure of education to achieve its goals. The quantitative and qualitative deficiency in buildings leads to inconvenient and unhealthy education atmosphere for students and thus causing deteriorations in the quality of education. Sometimes the condition of schools not only negatively impact the education quality or achievement but sometimes causes a threat to students' lives and consequently affecting the efficiency level of the education system (Ruggiero 1995).

Teachers play an important role in the students' education quality since they are the main source of transcending information and the main player in the education process (Afonso and Aubyn 2006). A qualified, trained, knowledgeable teacher will positively impact the students' academic achievement. Curricula also represent the core of the educational process and a main tool for achieving the set targets of the educational system in general, while impacting the efficiency of the education system. The Curricula are a crucial input in the education system and should not only be designed to tackle one dimension which is basically knowledge, but also should take into account other factors that nourish students' wellbeing such as psychological and social aspects(Ruggiero 1995).

As for the outputs of education, the literacy rate which basically measures the number of people who can write and read within a population or a target age group. The literacy rate is a very good indicator and output of the education system (Cuellar 2014). In which literacy rate can reflect the efficiency of the

education system output, in other words if the inputs of an education system are allocated efficiently and optimally the literacy rate should then be at a higher rate and the vice versa.

Enrolment rate is one of the main outputs that reflects the extent of efficiency an education system obtains (Afonso and Aubyn 2006). Enrolment rate is basically the number of students of the official age group of the population that are currently enrolled at any level of education. With the increase of enrolment rate at any levels of education, this means that the education output is maximized.

Repetition rates are among the important education output indicators that is basically when student is unable to pass tests and accordingly do not get nominated to the next education level. Repetition rate is also another main reason that drives students to not complete their studies since they get demotivated from their failure in the tests (Agasisti, 2014).

The unemployment rate is one of the reflective outputs of the efficiency of education system (Agasisti, 2014). An efficient education system will meet the needs of the goals it is set for in the first place. An efficient education system will meet the labour market needs through equipping and preparing students with the needed skills and knowledge of the labour market and to be able to perform in the companies and consequently drive economic growth and development. Actually, unemployment rate is the number of people within the working age group who doesn't acquire a job although they have the intention and willing to work

4. Assessment of the impact of education efficiency on economic development in selected Asian and North African Countries: A Comparative Study Approach.

4.1 Introduction

In order to assess and measure the impact of efficiency of education on economic development, this chapter will use empirical approach through employing a panel regression model to examine the relationship between education and economic development in selected Asian and North African Countries from the period of 2000 till 2021. The study has selected the North African Countries since there are very few studied tackled this region and compared it with Asian Countries education efficiency performance.

In addition, the study will select the Human Development Index as the dependent variable and a proxy to reflect economic development since this index takes into account the countries performance in education, income, and health sectors. In addition, the study will measure education efficiency through the following independent variables, which is education enrollment represented by (secondary and tertiary enrollment), literacy rate, unemployment, pupil to teacher ratios (secondary, and tertiary) and government expenditure on education. The control variables are foreign direct investment and inflation rate.

4.2 The Model

The regression model is constructed as follows:

$$HDI_{it} = \beta_0 + \beta_1 Secondary\ enrollment_{it} + \beta_2 Pupil\ to\ teatche\ ratio\ secondary + \beta_3 Tertiary\ enrollment_{it} \\ + \beta_4 Pupil\ to\ teacher\ ratio\ tertiary_{it} + \beta_5 literacy\ rate_{it} + \beta_6 government\ expenditure_{it} \\ + \beta_8 * FDI_{it} + \beta_9 * inflation_{it} + \beta_{10} * unemployment\ rate + \mu_i + \varepsilon_{it}$$

Variables:

Human Development Index (HDI): "HDI is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living. The HDI is the geometric mean of normalized indices for each of the three dimensions" (UNDP, 2019).

Tertiary Enrollment (TE): "The number of students enrolled in a level (Tertiary educational institutions) regardless of age and sex" (OECD Data).

Secondary Enrollment (SE): "The number of children enrolled in a level (primary or secondary schools) regardless of age and sex" (UNESCO Data).

Literacy Rate (LR): "Total number of literate persons in a given age group, expressed as a percentage of the total population in that age group" (UNESCO Data).

Government Expenditure on Education (INV): “Total Public Expenditure on Education” (OECD Data).

Pupil to Teacher Ratio Secondary: “is the number of students per teacher in secondary school”. (World Bank Data).

Pupil to Teacher Ratio Tertiary: “is the number of students per teacher in tertiary education”. (World Bank Data).

Unemployment Rate: is the number of people within the working age group who doesn’t acquire a job although they have the intention and willing to work (ILO).

Inflation rate (INF): “Is the annual percentage change in (CPI) Consumer Price Index”. (World Bank Data).

Foreign Direct Investment (FDI): “is the net inflows of investment coming to an economy” (World Bank Data).

4.3 “Overview of the Variables performance according to countries.”

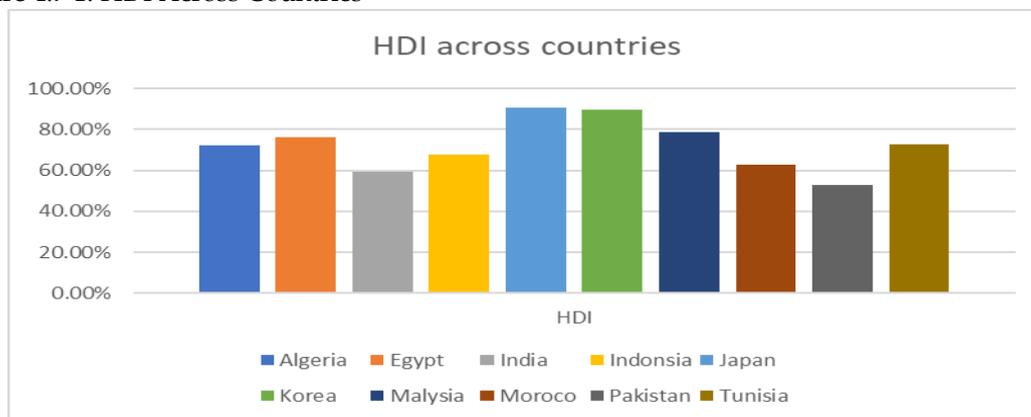
This section will illustrate the variables trends across 10 countries including Asian Countries: India, Japan, Indonesia, Korea, Malaysia, and Pakistan, while the North African Countries: Egypt, Algeria, Tunisia, and Morocco.

4.3.1 “Dependent Variable Across Countries”:

From the following graph it is clear that:

Highest average of HDI is in Japan, while the least is in Pakistan.

Figure 4.7 1: HDI Across Countries



4.3.2 Independent Variable Across Countries:

From the following graph it is clear that :

Highest average of secondary education enrollment is in Japan, while the least is in Pakistan.

Highest average of pupil-teacher secondary is in India, while the least is in Japan.

Highest average of tertiary education school enrollment is in Japan, while the least is in Pakistan.

Highest average of pupil-teacher tertiary is in Korea, while the least is in Pakistan.

Highest average of Literacy rate is in Japan, while the least is in Morocco.

Highest average of government expenditure % of GDP is in Malaysia, while the least is in Japan.

Highest average of unemployment rate is in Algeria, while the least average is in Pakistan.

Figure 4.8 1: Independent Variables Across Countries

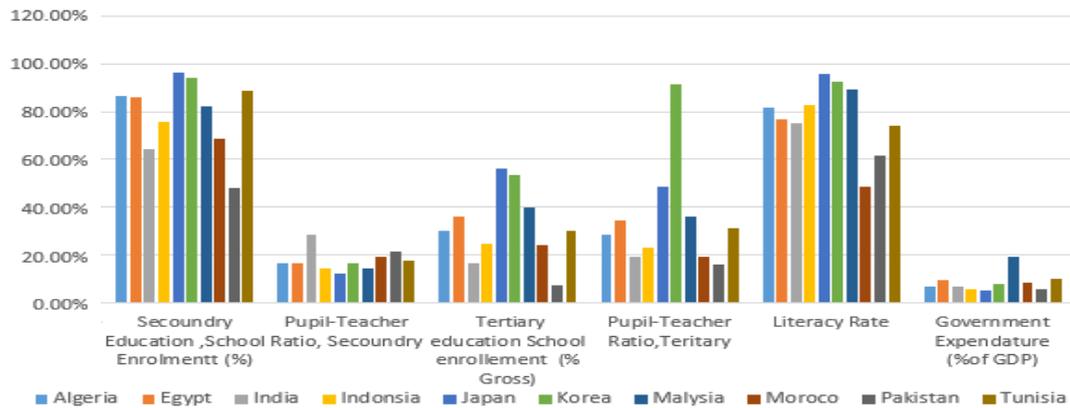
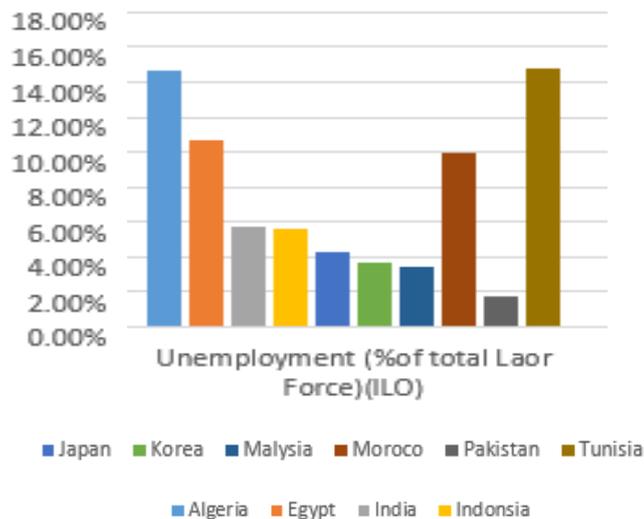


Figure 4.9 1: Unemployment Across Countries.



4.4 “The Results of the Model “ The relationship between HDI and efficiency of education variables”

After conducting the necessary tests and choosing the type of regression model that suits our model parameters. The Panel Regression Model Analysis will be based on selecting Fixed Effect Model and then adopting the GMM model to correct for any serial correlation problems. In addition, the robust estimation will also be taken into consideration in order to tackle the heteroscedasticity problem. It is worth mentioning that the regression model aims at measuring and assessing the Relationship between HDI (Proxy to Human Development) and efficiency of education variables. In which the Results of the regression can be shown in the below table:

Table 4.4 1: Results of fixed-effect model with confidence level 95%:

VARIABLES	Fixed effect HDI
Secondary Education School Enrollment	0.00261*** (0.000284)
Pupil Teacher Ratio Secondary	-0.00270*** (0.000678)
Tertiary education School enrollment	0.00413*** (0.000914)
Pupil Teacher Ratio Tertiary	0.00150*** (0.000281)
Literacy Rate	0.000261*** (9.77e-05)
Government Expenditure of GDP	0.00325*** (0.000777)
Unemployment	-0.00678*** (0.00139)
Foreign Direct Investment US	0.000214 (0.000212)
Inflation Average Consumer prices	-0.00219*** (0.000322)
L.HDI	
Constant	0.543*** (0.0265)
Observations	220
R-squared	0.629
Number of Countries	10
Robust standard errors in parentheses	
*** p<0.01, ** p<0.05, * p<0.1	

According to the results of the regression model, almost all Education Efficiency Variables had a Positive and Significant effect on HDI. This result was expected since the literature review has backed up the role of education in spurring economic development. Secondary education school enrollment, Tertiary education School enrollment, Literacy Rate, Government expenditure, Pupil teacher ratio tertiary, had a significant positive impact on HDI. In addition, the model had recorded the Adjusted R-square is 0.627 this means that the estimated fixed effect model explains around 62.7% of the variation in the HDI. In other words, the dependent variable is explained by the independent variables by 62.7%.

While on the other hand, Unemployment Rate had a negative and significant impact on HDI since economic theories has also stated that unemployment rates negatively affect the economic development of countries and in some cases, it can also drive to extreme poverty while wasting resources and draining of skills.

As for the Control Variables, The FDI had insignificant positive impact on HDI since FDI can contributes in attracting more jobs to the local economy, while inflation has significant negative impact on HDI since and according to Phillips curve there is an inverse relationship between Unemployment and Inflation and the higher the inflation gets the more it causes unemployment that negatively affects the economic development.

It is worth mentioning that North African countries compared to the Asian Countries has the least rates when it comes to efficiency of education variables and thus North African countries lag behind in their economic development performance which reflected in their low scores of the Human Development Index. The low rates of efficiency of education in the North African countries were due to the characteristics of their education system which was acknowledged by being not up to date, underdeveloped infrastructure, traditional learning tools, and low government spending.

While on the other hand, Asian Countries pay more attention on spending on education and even focusing more on enhancing the quality of education through making sure that Pupil to teacher ratio is

low, providing up to date learning tools, diversifying curriculum, offering different types of tests, etc. Therefore, high efficiency of education that consequently yields to promoting economic development is achieved within Asian Countries.

5. Conclusion

Throughout the years and according to the literature, economic development concept has undergone changes until it had proved through the evolution of economic development theories that development is a multidimensional process that requires different angles and factors to be taken into consideration in order to promote development and to support countries' economies. In fact, promoting economic development had yield constructive contribution on flourishing economies. Accordingly, countries have diverted from only concentrating on achieving economic growth to working towards achieving economic development.

This has led international organization to start acknowledging the gains and fruitful yields that economic development has promoted. Therefore, development goals and measures has been introduced by international organization for countries and governments to start applying in their long-term national agendas, aiming at enhancing and developing almost all sectors and fields of their economies.

Like economic development theories, also development goals had gone through changes until settling on the most common and prominent goals of development which is introduced by the United Nation and known for the Sustainable development Goals (SDGs). The SDGs became a mandate for countries to achieve through given a set of targets in each field such as: reducing poverty, improving education, and etc.

In fact, one of the most important factors that spurs economic development is education and especially when you focus on efficiency of education. Since Efficiency is a term that has caught much of the attention of economists since long time ago and by the time the natural resources became scarcer and not utilized efficiently to meet the current and the future generation needs, countries have been focusing on being "Efficient" to achieve growth and sustainable development.

Efficiency can be implemented and reflected in many sectors, however this study has presented how efficiency can be reflected and applied to the education sector and what are the measures and determinants of efficiency in education, since education is an indicator and a main driver to economic development.

After reviewing the literature review, studies proved that there is a positive relationship between efficiency of education/education and economic development, which validates the economic theories that were reviewed in previous sections from prominent scholars who confirmed that there is a positive relationship between efficiency of education and economic development.

Accordingly, the study measured education efficiency through the following independent variables, which is education enrollment represented by (secondary and tertiary enrollment), literacy rate, unemployment, pupil to teacher ratios (secondary, and tertiary) and government expenditure on education. On the other hand, the Human Development Index was selected as the dependent variable and a proxy to reflect economic development. The control variables are foreign direct investment and inflation rate.

After running the Panel Regression model on the 10 selected Asian and North African Countries, it happens to be that the selected independent variables which reflect the efficiency of education which are: Government expenditure, literacy rate, unemployment, secondary enrollment, tertiary enrollment, Pupil to teacher ratio secondary has positive and significant impact on economic development which is represented by the Human Development Index. The Panel regression model recorded adjusted R-square is 0.627 which means that the estimated fixed effect model explains around 62.7% of the variation in the HDI. In other words, the dependent variable is explained by the independent variables by 62.7%.

The outcomes indicated that Asian countries had higher rates of efficiency of education and thus higher economic development stance. On the Contrary, North African countries had low rates of education efficiency and lagged behind in the economic development ranks compared to Asian Countries this was due to the characteristics of their education system which was acknowledged by being underdeveloped infrastructure, traditional learning tools, and low government spending.

Finally, investing in education and paying attention to obtain the maximum output of education given a set of education inputs in other words increasing efficiency and the quality of education is a promising process that promote economic development for economies and achieving the sustainable development goals and targets set for each country.

References

- Afonso, A., & Aubyn, M. (2006). "Cross-country efficiency of secondary education provision: a semi-parametric analysis with non-discretionary inputs", *Economic Modelling*, 23 (1), P.476- 491.
- Agasisti, T. (2014). The efficiency of public spending on Education: an empirical comparison of EU countries. *European Journal of Education*, 49 (4), 81-104.
- Ali,H.(2018). "Economy Development: From Theories to Strategies and Economic Policies", *FEPS Journal,Cairo*,P.45-46.
- Carmignani,F. (2016). "Does government spending on education promote economic growth?", *The conversation*, P.1.
- Coccia, M. (2019)."Theories of Development", *National Research Council of Italy*,P.3.
- Cuellar, A. F. S. (2014). "The efficiency of education expenditure in Latin America and lessons for Colombia", *Desarrollo y Sociedad*, 74 (1),P. 19-67.
- Feldman,M.(2014)."Economic Development: A Definition and Model for Investment", *University of North Carolina*,P.3-6.
- Goulet, D. (1971)."The Cruel Choice: A New Concept in the Theory of Development", *New York*.
- Griffiths,A. and Wall,S.(2000). "Intermediate Microeconomics: Theory and Application", second edition, *Prentice Hall*, pp.433-434
- Hall, J.,&Helliwell,J (2014)."Happiness and Human Development", *UNDP*, p. 2&6.
- Kates, W. & Parris, M. (2003)."Long-term trends and a sustainability transition", *USA*,P.8062- 8067
- Lavado, R. and Cabanda,E. (2009). "The efficiency of health and education expenditures in the Philippines",*Central European Journal of Operations Research*, P.275-91
- Lewis, W. (1963). "Is economic growth desirable?" in *The Theory of Economic Growth*, *London*.
- Longyu, S. , Linwei H., Fengmei Y.,& Lijie G. (2019)." The Evolution of Sustainable Development Theory: Types, Goals, and Research Prospects", *University of Chinese Academy of Sciences, China*, P.1-4.
- Omoera, S.(2019)." Neo-colonial Dependence and Dualistic Development Models: An Exploration of the Development Communication Trajectory in Nigeria" ,*The Journal of Society and Media* 2019, Vol. 3(2),P.4.
- Piętak, L. (2014)."Review of Theories and Models of Economic Growth", *Comparative Economic Research*, P.53-55.
- Ruggiero, J. (1995). "Efficiency of educational production: An analysis of New York school districts", *Review of Economics and Statistics*, P. 499-509.
- Simpas, S., Garcia, R.and Ramiro,E. (1981). "A Study of Efficiency, Effectiveness and Productivity of Filipino Administrative Agencies", *Science Diliman*, vol.1, p. 182.
- Todaro, M., & Smith, S. (2011). *Economic development (11th ed.)*.Harlow: Pearson Education Limited, P.15-17.