ISSN: 2583-7354

International Journal of Emerging Knowledge Studies

Publisher's Home Page: https://www.ijeks.com/

Fully Open Access Research Paper

Human Capital Formation and Economic Development: A Review of Theoretical and Empirical Literature

Mahesh Kumar Zala[1*]

[1]Maharaja Sayajirao University of Baroda, Vadodara, Gujarat, India.

DOI: https://doi.org/10.70333/ijeks-05-04-002

*Corresponding Author: maheshzala727@gmail.com

Article Info: - Received : 08 February 2026 **Accepted** : 25 March 2026 **Published** : 30 March 2026

Abstract

Human capital formation plays a significant role in economic development by improving the productivity, efficiency, and innovative capacity of the labor force. Human capital includes education, health, skills, training, and knowledge, which are essential for economic growth and development. The main objective of this study is to examine the role of human capital formation in economic development through a review of theoretical and empirical literature. The study reviews major theories such as Human Capital Theory, Endogenous Growth Theory, and the Augmented Solow Growth Model, which explain the importance of human capital in economic growth. The empirical literature shows that human capital formation has a positive impact on economic growth by improving labor productivity, promoting technological innovation, and increasing income levels. The study also identifies research gaps in the existing literature, such as the lack of focus on education quality, skills, innovation, and sustainability. The study suggests that governments should invest more in education, health, skill development, and research and development to promote human capital formation and economic development. The study concludes that human capital formation is a key driver of economic development and is essential for achieving sustainable economic growth and improving the standard of living.

Keywords: *Human Capital, Economic Development, Productivity, Innovation, Sustainable Development.*

1. Introduction

Human capital formation plays a crucial role in the economic development of a country. It refers to the accumulation of education, skills, training, health, and knowledge that enhance the productivity and efficiency of individuals in the workforce. In modern economic theory, human capital is considered one of the most important factors of economic growth, alongside physical capital and technological progress. Countries that invest more in education and health tend to experience higher economic growth and development compared to those that do not invest adequately in human capital.

The concept of human capital was first systematically developed by **Becker (1962),** who

argued that education and training are forms of investment that increase an individual's productivity and earnings. Similarly, **Mincer (1958)** explained that investment in education and skills improves income levels and employment opportunities. These theories established that expenditure on education and health should be treated as an investment rather than consumption because it contributes to future economic benefits.

Human capital is also a central element in modern growth theories. The endogenous growth theory developed by **Romer (1990) and Lucas (1988)** emphasizes that human capital contributes to technological progress, innovation, and knowledge creation, which are key drivers of long-term economic growth. Unlike the Solow growth model, which treats technological progress as an external factor, endogenous growth models consider human capital as an internal factor that directly influences economic growth.

Furthermore, several empirical studies have shown a positive relationship between human capital and economic growth. For example, **Barro and Lee (1993)** found that countries with higher levels of education attainment experienced higher economic growth. **Hanushek and Woessmann (2008)** argued that cognitive skills and quality of education are more important than just years of schooling in promoting economic development. Similarly, **Mankiw, Romer, and Weil (1992)** included human capital in the augmented Solow model and demonstrated that human capital significantly affects economic growth.

In developing countries, human capital formation is particularly important because it helps in poverty reduction, income inequality reduction, technological adoption, and improvement in living standards. Investment in education improves labor productivity, while investment in health increases life expectancy and work efficiency, both of which contribute to economic development **(Becker, 1962; Lucas, 1988; Romer, 1990).**

Therefore, human capital formation is not only a driver of economic growth but also an essential component of economic development, as it improves the overall quality of life, employment opportunities, and income distribution in an economy. This study aims to review the theoretical and empirical literature on human capital formation and its impact on economic development and to identify research gaps and policy implications.

2. Background of the Study

The concept of human capital emerged as an important area of study in economics during the mid-twentieth century, when economists began to recognize that education, health, and skills contribute significantly to economic productivity and growth. Early economic theories mainly focused on physical capital and labor as the main factors of production, but later studies highlighted that the quality of labor, which depends on education and skills, is equally important for economic development. **Schultz (1961) and Becker (1962)** were among the first economists to emphasize that investment in education and health improves human capabilities and increases productivity, thereby contributing to economic growth.

During the **1950s and 1960s**, growth models such as the Solow Growth Model explained economic growth in terms of physical capital accumulation, labor growth, and technological progress **(Solow, 1956).** However, the model treated technological progress as an external factor and did not explain how technology develops. Later, economists such as **Lucas (1988) and Romer (1990)** introduced endogenous growth theory, which explained that human capital formation, knowledge, and innovation are the main drivers of technological progress and long-term economic growth. These models highlighted that countries investing in human capital can achieve sustained economic growth.

Over time, researchers began to study the relationship between human capital and economic development using empirical methods. **Barro and Lee (1993)** developed international data on educational attainment and found that higher levels of education are associated with higher economic growth. Similarly, **Mankiw, Romer, and Weil (1992)** expanded the Solow growth model by including human capital and found that differences in human capital explain differences in income levels across countries. **Hanushek and Woessmann (2008)** further argued that the quality of education, particularly cognitive skills, plays a crucial role in economic growth rather than just the quantity of education.

In developing countries, human capital formation is particularly important because these countries often face problems such as low productivity, unemployment, poverty, and income inequality. Investment in education improves skills and employability, while investment in health increases labor productivity and life expectancy. Therefore, human capital formation is considered a key factor in promoting economic development, reducing poverty, and improving living standards **(Psacharopoulos & Patrinos, 2004).**

Despite the importance of human capital, many developing countries still face challenges such as low education quality, inadequate health facilities, brain drain, and lack of skill development programs. These problems limit the contribution of human capital to economic growth and development. Therefore, it is important to study the role of human capital formation in economic development and analyze both theoretical and empirical literature to understand this relationship more clearly. This study attempts to review the existing literature on human capital formation and economic development and identify the research gaps for future research.

3. Objectives of the Study

The main objective of this study is to examine the role of human capital formation in economic development by reviewing the theoretical and empirical literature. Human capital, which includes education, health, skills, and training, plays an important role in improving productivity, increasing income levels, and promoting economic growth. Therefore, this study attempts to understand how human capital contributes to economic development and what factors influence human capital formation.

The specific objectives of the study are as follows:

- To study the concept and components of human capital formation.
- To review the theoretical literature on human capital and economic development.
- To review empirical studies on human capital formation and economic development.
- To examine the relationship between human capital formation and economic development.
- To identify research gaps in the existing literature on human capital and economic development.
- To suggest policy implications for improving human capital formation.

4. Significance of the Study

The significance of this study lies in understanding the importance of human capital formation in the process of economic development. Human capital is considered one of the most important factors that determine economic growth, productivity, and the overall development of a nation. Investment in human capital through education, health, and skill development improves the efficiency and productivity of the labor force, which ultimately contributes to economic growth **(Becker, 1962; Lucas, 1988).**

This study is significant because it provides a comprehensive review of both theoretical and empirical literature on human capital formation and economic development. Theoretical models such as the Human Capital Theory and Endogenous Growth Theory explain that education and knowledge accumulation are key drivers of long-term economic growth **(Romer, 1990; Mankiw, Romer, & Weil, 1992).** By reviewing these theories, the study helps to understand how human capital contributes to technological progress, innovation, and productivity growth.

The study is also important for policymakers and government authorities. It explains how investment in education and health sectors can promote economic development, reduce poverty, reduce income inequality, and improve the standard of living of people. Empirical studies have shown that countries that invest more in human capital achieve higher economic growth and development compared to countries that invest less in education and health **(Barro & Lee, 1993; Hanushek & Woessmann, 2008).**

Furthermore, this study is significant for researchers and academicians because it identifies research gaps in the existing literature and provides direction for future research. It helps future researchers to understand what has already been studied and what areas need further investigation, especially in developing countries where human capital formation is still a major challenge.

Finally, the study is significant because human capital formation not only affects economic growth but also influences social development indicators such as employment, income distribution, poverty reduction, and overall human development. Therefore, understanding the relationship between human capital formation and economic development is essential for achieving sustainable economic development **(Psacharopoulos & Patrinos, 2004).**

Thus, this study highlights the importance of human capital formation in economic development and provides useful insights for policymakers, researchers, and educators to formulate policies and strategies for improving human capital and promoting economic development.

5. Conceptual Framework

The conceptual framework of this study explains the relationship between human capital formation and economic development. Human capital formation is considered an important factor that influences economic growth and development. Human capital includes education, health, skills, training, and knowledge, which improve the productivity and efficiency of labor. When the level of human capital increases, the productivity of workers increases, which leads to higher output, higher income, and overall economic development.

In this study, human capital formation is treated as the independent variable, while economic development is treated as the dependent variable. Human capital formation is measured through indicators such as education, health, skills, and training. These components influence employment, productivity, technological progress, and income levels, which ultimately lead to economic development.

The conceptual framework shows that investment in education improves knowledge and skills, investment in health improves physical and mental ability to work, and skill development programs improve technical efficiency. All these factors increase labor productivity, which leads to increased economic growth and economic development. Therefore, there is a positive relationship between human capital formation and economic development.

The framework also shows that government policies, education expenditure, health expenditure, and training programs play an important role in human capital formation. These factors indirectly affect economic development through human capital formation. Thus, human capital acts as a link between government investment and economic development.

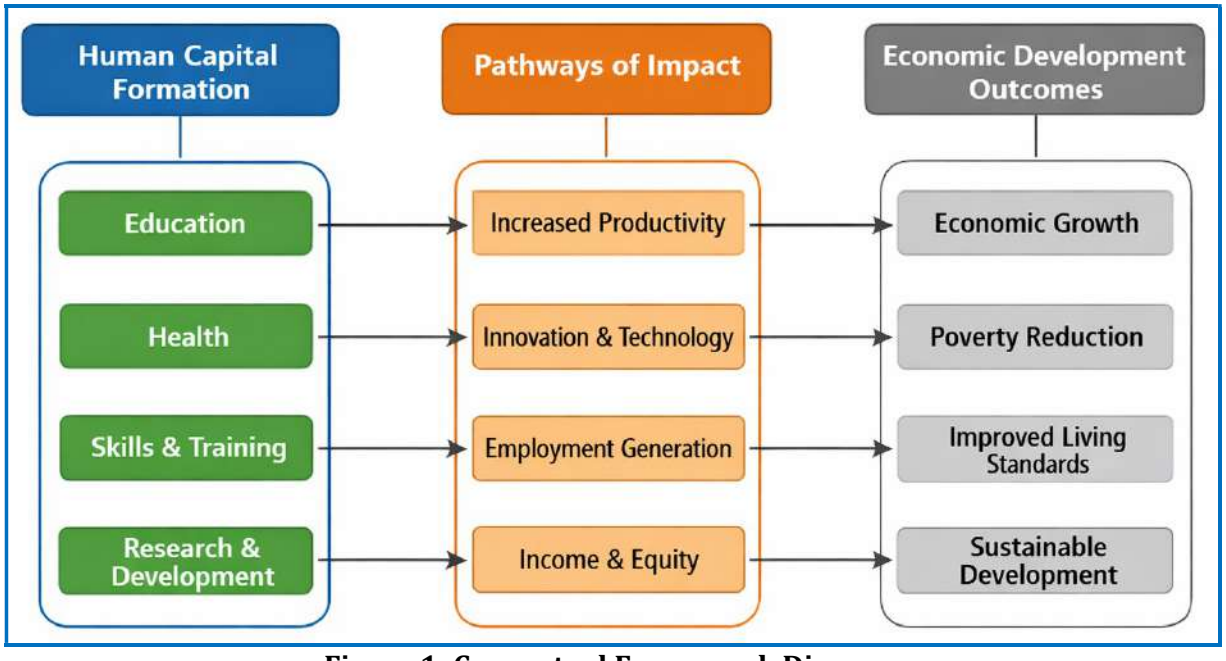

Figure 1: Conceptual Framework Diagram

ISSN: 2583-7354

Table 1: Components of Human Capital and Indicators

S.No	Components of Human Capital	Indicators
1	Education	Literacy rate, School enrollment, Years of schooling, Higher education enrollment
2	Health	Life expectancy, Health expenditure, Infant mortality rate
3	Skills	Vocational training, Technical education, Skill development programs
4	Training	On-the-job training, Employee training programs
5	Knowledge	Research and development (R&D), Innovation, Technology adoption
6	Experience	Work experience, Labor productivity
7	Social Capabilities	Communication skills, Management skills

6. Theoretical Literature Review

The theoretical literature on human capital formation and economic development explains how education, health, skills, and knowledge contribute to economic growth and development. Several economic theories have emphasized the importance of human capital as a key factor of production and long-term economic growth.

One of the earliest theories related to economic growth is the Solow Growth Model developed by **Solow (1956).** This model explains that economic growth depends on physical capital, labor, and technological progress. However, the Solow model treats technological progress as an exogenous factor and does not explain how technology is created. Later economists argued that human capital plays an important role in technological progress and productivity growth.

The Human Capital Theory developed by **Becker (1962) and Schultz (1961)** explains that education, training, and health are investments that increase the productivity and earnings of individuals. According to this theory, expenditure on education and health is not consumption but an investment because it generates future returns in the form of higher income and economic growth.

The Mincer Earnings Function **(Mincer, 1958)** also supports human capital theory by explaining the relationship between education, experience, and income. The theory states that higher education and work experience lead to higher earnings, which reflects higher productivity of skilled workers.

The Endogenous Growth Theory developed by **Lucas (1988) and Romer (1990)** further explained the role of human capital in economic growth. **Lucas (1988)** emphasized that human capital accumulation improves labor productivity and generates positive externalities in the economy. **Romer (1990)** argued that human capital contributes to research, innovation, and technological development, which are the main drivers of long-term economic growth.

Another important contribution is the Augmented Solow Model developed by **Mankiw, Romer, and Weil (1992)**, which included human capital as an additional factor in the Solow growth model. The study found that differences in human capital explain differences in income levels and economic growth across countries.

These theories clearly show that human capital formation plays a crucial role in economic growth by improving productivity, promoting technological progress, increasing income levels, and supporting overall economic development. Therefore, human capital is considered a key driver of economic development in both developed and developing countries.

ISSN: 2583-7354

Table 2: Summary of Theoretical Models

S.No	Theory / Model	Author	Year	Main Contribution
1	Human Capital Theory	Becker	1962	Education and training are investments that increase productivity and income
2	Human Capital Theory	Schultz	1961	Investment in education and health improves human capabilities
3	Mincer Earnings Function	Mincer	1958	Education and experience increase earnings
4	Solow Growth Model	Solow	1956	Growth depends on capital, labor, and technology
5	Endogenous Growth Theory	Lucas	1988	Human capital accumulation drives economic growth
6	Endogenous Growth Theory	Romer	1990	Human capital promotes innovation and technological progress
7	Augmented Solow Model	Mankiw, Romer & Weil	1992	Human capital explains differences in growth across countries
8	Technological Diffusion Theory	Nelson & Phelps	1966	Human capital helps in adopting new technology

7. Empirical Literature Review

The empirical literature on human capital formation and economic development provides strong evidence that human capital plays a significant role in promoting economic growth and development. Many researchers have used indicators such as education, health, school enrollment, years of schooling, life expectancy, and skill development to measure human capital and examine its impact on economic growth. Most empirical studies have found a positive relationship between human capital and economic growth.

Barro and Lee (1993) conducted a cross-country study using educational attainment data and found that higher levels of education are associated with higher economic growth. Similarly, **Mankiw, Romer, and Weil (1992)** included human capital in the augmented Solow growth model and found that human capital significantly explains differences in income levels and economic growth across countries.

Benhabib and Spiegel (1994) examined the relationship between human capital and economic growth and found that human capital contributes to economic growth mainly through technological innovation and the adoption of new technologies rather than only through labor productivity. **Engelbrecht (1997)** also found that human capital plays an important role in benefiting from international research and development spillovers.

Bils and Klenow (2000) examined the relationship between schooling and economic growth and argued that the relationship may run in both directions, meaning that education promotes economic growth and economic growth also promotes education. This indicates that there is a strong relationship between human capital and economic growth.

Hanushek and Woessmann (2008) emphasized that the quality of education is more important than the quantity of education in promoting economic growth. Their study showed that cognitive skills have a strong effect on economic growth. **Psacharopoulos and Patrinos (2004)** found that the rate of return to education is high, especially in developing countries, which indicates that investment in education contributes to economic growth and development.

Several empirical studies have been conducted in developing countries. **Abbas and Foreman-Peck (2008)** found that human capital had a positive impact on economic growth in Pakistan. **Rahman (2011)** found that education and health expenditure had a positive impact on GDP in Bangladesh. **Kanayo (2013)** found that human capital formation significantly contributed to economic growth in Nigeria. **Akpolat (2014)** found that human capital investment has a long-run positive effect on GDP. **Pelinescu (2015)** also

found a positive relationship between human capital and economic growth.

Recent empirical studies have also examined the relationship between human capital, research investment, innovation, and economic growth. **Bambi and Pea-Assounga (2025)** used a panel VAR model and found that education and research investment significantly contribute to human capital development, which in turn promotes technological innovation and economic growth. This study shows that human capital affects economic growth not only through labor productivity but also through innovation and technological development.

Overall, the empirical literature shows that human capital formation has a significant positive impact on economic development. Education, health, skills, and research investment improve labor productivity, promote innovation, facilitate technology adoption, and increase income levels. However, the literature also shows that the quality of education and effective government policies play an important role in maximizing the benefits of human capital formation for economic development.

Table 3: Summary of Empirical Studies

S.No	Author(s)	Year	Country/Area	Method	Major Findings
1	**Barro & Lee**	**1993**	Cross-country	Regression	Education positively affects economic growth
2	**Mankiw, Romer & Weil**	**1992**	Cross-country	Augmented Solow Model	Human capital explains income differences
3	**Benhabib & Spiegel**	**1994**	Cross-country	Regression	Human capital promotes innovation and technology adoption
4	**Engelbrecht**	**1997**	International	Regression	Human capital helps in R&D spillovers
5	**Bils & Klenow**	**2000**	Cross-country	Regression	Education and growth have two-way relationship
6	**Hanushek & Woessmann**	**2008**	International	Regression	Education quality is important for growth
7	**Psacharopoulos & Patrinos**	**2004**	International	Rate of Return Analysis	Education has high economic returns
8	**Abbas & Foreman-Peck**	**2008**	Pakistan	Time Series	Human capital positively affects growth
9	**Rahman**	**2011**	Bangladesh	Time Series	Education & health expenditure increase GDP
10	**Kanayo**	**2013**	Nigeria	Regression	Human capital promotes economic growth
11	**Akpolat**	**2014**	Panel Data	Panel Regression	Human capital has long-run positive effect
12	**Pelinescu**	**2015**	International	Regression	Positive relationship between human capital & growth
13	**Bambi & Pea-Assounga**	**2025**	Panel Data	Panel VAR	Human capital promotes innovation and growth

8. Methodological Approaches in Literature

The literature on human capital formation and economic development has used a variety of methodological approaches to examine the relationship between human capital and economic growth. These methods include cross-country analysis, time-series analysis, panel data analysis, and various econometric techniques. The choice of methodology depends on the objectives of the study, availability of data, and the nature of the relationship between human capital and economic development.

One of the most widely used methods in the literature is cross-country regression analysis, which uses data from multiple countries to analyze the impact of human capital on economic growth. For example, **Barro and Lee (1993)** used international data on educational attainment to analyze its effect on economic growth across countries. Similarly, **Mankiw, Romer, and Weil (1992)** used cross-country regression analysis in the augmented Solow model and found that human capital significantly affects economic growth and income differences among countries.

Another commonly used method is time-series analysis, which examines the relationship between human capital and economic growth over a long period within a single country. **Abbas and Foreman-Peck (2008)** used time-series analysis to examine the relationship between human capital and economic growth in Pakistan and found a positive long-run relationship between human capital and economic growth.

Many recent studies have used panel data analysis, which combines both cross-country and time-series data. Panel data analysis is considered more reliable because it controls for country-specific effects and time-specific effects. **Akpolat (2014)** used panel data analysis to examine the long-term impact of human capital on economic growth and found that human capital investment has a significant positive effect on GDP. Similarly, **Bambi and Pea-Assounga (2025)** used a panel Vector Autoregression (Panel VAR) model to examine the relationship between education, research investment, human capital development, and technological innovation, and found that human capital contributes significantly to technological innovation and economic advancement.

In addition to these methods, several econometric techniques have been used in the literature, such as Ordinary Least Squares (OLS), Multiple Regression Analysis, Cointegration Analysis, Vector Error Correction Model (VECM), Autoregressive Distributed Lag (ARDL) Model, and Granger Causality Test. These methods are used to examine both short-run and long-run relationships between human capital and economic growth and to determine the direction of causality between the variables.

Some studies have also used qualitative methods, such as literature reviews, case studies, and policy analysis, to understand the role of education and health policies in human capital formation and economic development. These methods are useful for understanding institutional factors, government policies, and structural issues affecting human capital formation.

Overall, the literature shows that different methodological approaches have been used to analyze the relationship between human capital formation and economic development. Cross-country and panel data methods are the most commonly used approaches, while time-series methods are useful for country-specific analysis. Econometric techniques help to measure the magnitude and direction of the relationship between human capital and economic development. Therefore, the selection of an appropriate methodology is very important for accurately analyzing the relationship between human capital formation and economic development.

9. Human Capital and Economic Development Nexus

Human capital and economic development are closely related because human capital plays a crucial role in increasing productivity, promoting technological progress, and improving the overall efficiency of the economy. Human capital includes education, health, skills, training, and knowledge, which improve the quality of labor and increase the productive capacity of an economy. Therefore, countries that invest more in human capital tend to achieve higher levels of economic development.

The relationship between human capital and economic development can be explained through productivity growth. Education improves the knowledge and skills of workers, which increases their efficiency and productivity. Health improves the physical and mental ability of workers, which increases their working capacity and reduces absenteeism. Skill development and training improve technical knowledge and innovation capacity. All these factors lead to higher productivity, which increases output and income levels in the economy.

Human capital also plays an important role in technological progress and innovation. According to endogenous growth theory, human capital contributes to research, innovation, and technological development, which are essential for long-term economic growth **(Lucas, 1988; Romer, 1990).** Countries with higher human

ISSN: 2583-7354

capital can adopt new technologies more easily and use resources more efficiently, which promotes economic development.

Human capital formation also contributes to employment generation, poverty reduction, income distribution, and improvement in living standards. Education increases employment opportunities and income levels, while health improves life expectancy and quality of life. Therefore, human capital formation contributes not only to economic growth but also to overall economic development.

The relationship between human capital and economic development can be shown in the following model:

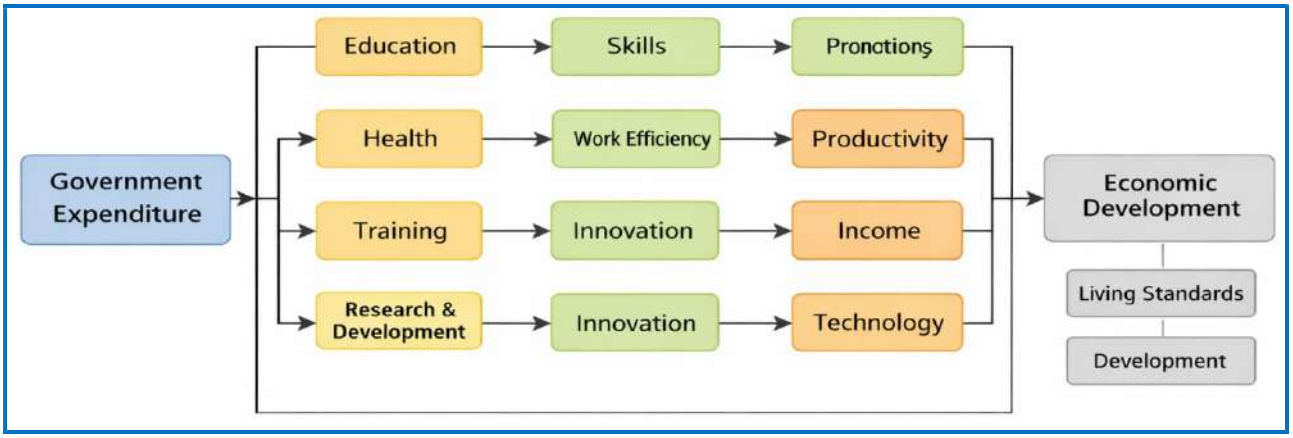

Figure 2: Human Capital–Growth Linkage Model

Human capital formation is influenced by government expenditure on education and health, training programs, research and development, and skill development programs. These factors improve human capital, which leads to increased productivity and economic development. Thus, human capital acts as a link between government investment and economic development.

In developing countries, the role of human capital is particularly important because these countries often face problems such as low productivity, unemployment, and poverty. Investment in education, health, and skill development can help developing countries achieve faster economic development and improve the standard of living of the people. Therefore, human capital formation is considered a key factor in achieving sustainable economic development.

10. Research Gaps in Literature

Although a large number of studies have examined the relationship between human capital formation and economic development, there are still several research gaps in the existing literature. Identifying these gaps is important for conducting further research and improving the understanding of the relationship between human capital and economic development.

First, many studies have focused mainly on education as a measure of human capital, while other important components such as health, skills, training, and research and development have received less attention. Human capital is a multidimensional concept, and focusing only on education does not fully capture the overall impact of human capital on economic development.

Second, many empirical studies have used quantitative measures of education such as years of schooling and enrollment rates, but fewer studies have focused on the quality of education, skill development, and practical knowledge. As argued by **Hanushek and Woessmann (2008)**, the quality of education is more important than the quantity of education in promoting economic growth. Therefore, more research is needed to examine the impact of education quality on economic development.

Third, most of the existing studies are based on cross-country data, which may not reflect country-specific conditions. There is a need for more country-specific studies, especially in developing countries, to understand the role of human capital formation in economic development under different economic and social conditions.

Fourth, there are limited studies that examine the relationship between human capital, technological innovation, research and development, and environmental sustainability together. Recent studies suggest that human capital plays an important role in innovation and sustainable development, but more research is needed in this area.

Fifth, many studies have focused on the relationship between human capital and economic growth, but fewer studies have examined the relationship between human capital and economic development indicators such as poverty reduction, income distribution, employment, and human development index.

Sixth, there is a lack of studies using advanced econometric methods such as panel VAR, ARDL models, and cointegration techniques in developing countries due to lack of data availability. Therefore, more research is needed using advanced econometric techniques to understand the long-run and short-run relationship between human capital and economic development.

Finally, there is a need for more recent data and updated studies to understand the changing role of human capital in the modern economy, especially in the context of digital economy, knowledge economy, and technological development.

11. Policy Implications

The findings from the theoretical and empirical literature on human capital formation and economic development provide important policy implications for governments, policymakers, and educational institutions. Human capital formation plays a crucial role in improving productivity, promoting economic growth, and achieving long-term economic development. Therefore, governments should implement effective policies to improve education, health, skills, and training in order to enhance human capital formation.

One of the most important policy implications is that governments should increase investment in the education sector. Education improves knowledge, skills, and productivity of the labor force, which leads to higher economic growth. However, policymakers should focus not only on increasing enrollment but also on improving the quality of education, including curriculum development, teacher training, and infrastructure development. As highlighted in the literature, the quality of education plays a more important role than the quantity of education in promoting economic growth **(Hanushek & Woessmann, 2008).**

Another important policy implication is that governments should increase investment in the health sector. A healthy labor force is more productive and efficient, which contributes to economic development. Investment in healthcare services, hospitals, nutrition programs, and sanitation can improve life expectancy and reduce disease, thereby increasing labor productivity and economic output.

Governments should also promote skill development and vocational training programs to improve the employability of the labor force. In many developing countries, there is a mismatch between education and job market requirements. Skill development programs can help to reduce unemployment and increase productivity by providing technical and practical skills.

Investment in research and development (R&D) and innovation is also important for human capital formation and economic development. Human capital contributes to technological progress and innovation, which are important drivers of long-term economic growth. Therefore, governments should support universities, research institutions, and innovation centers.

Another policy implication is that governments should reduce brain drain by providing better employment opportunities, research facilities, and working conditions for skilled workers. Brain drain reduces the stock of human capital in developing countries and slows down economic development.

Governments should also ensure equal access to education and health services to reduce income inequality and promote inclusive growth. Investment in human capital not only promotes economic growth but also reduces poverty and improves income distribution **(Psacharopoulos & Patrinos, 2004).**

Finally, governments should formulate policies that integrate education, health, skills, and technology because human capital is a multidimensional concept. A comprehensive human capital development policy can significantly contribute to economic development and improve the standard of living of people.

12. Future Research and Recommendations

Based on the review of theoretical and empirical literature on human capital formation and economic development, several suggestions can be made for future research. Although many studies have examined the relationship between human capital and economic growth, there is still a need for more comprehensive and updated research in this area, especially in developing countries.

Future research should focus on developing a comprehensive human capital index that includes education, health, skills, training, research and development, and technology. Most existing studies measure human capital only through education indicators such as years of schooling and enrollment rates, which do not fully capture the multidimensional nature of human capital.

Future studies should also examine the quality of education rather than only the quantity of education. The quality of education, including cognitive skills, technical skills, and practical knowledge, plays a more important role in economic development than simply increasing the number of years of schooling.

Another important area for future research is the relationship between human capital, innovation, and technological development. In the modern knowledge-based economy, human capital contributes to research, innovation, and technological progress, which are important drivers of economic growth. Therefore, future studies should include variables such as research and development expenditure, innovation index, and technology adoption.

Future research should also focus on the relationship between human capital and sustainable development, including environmental sustainability and green growth. Recent studies suggest that human capital plays an important role in environmental awareness, sustainable technology, and efficient use of natural resources.

There is also a need for more country-specific studies, especially in developing countries, to understand how human capital formation affects economic development under different economic and social conditions. Country-specific studies can provide more accurate policy recommendations.

Future research should use advanced econometric methods such as Panel Data Models, Panel VAR, ARDL Model, Cointegration Analysis, and Granger Causality Test to examine the short-run and long-run relationship between human capital and economic development.

Finally, future research should use recent data and modern indicators such as Human Development Index (HDI), Knowledge Economy Index, Innovation Index, and Digital Skills Index to better measure the impact of human capital on economic development.

13. Conclusion

This study examined the relationship between human capital formation and economic development by reviewing the theoretical and empirical literature. Human capital formation, which includes education, health, skills, training, and knowledge, is an important factor in promoting economic growth and economic development. The study shows that investment in human capital improves labor productivity, promotes technological progress, increases income levels, and improves the overall standard of living.

The theoretical literature shows that human capital plays a central role in economic growth models. The Human Capital Theory explains that education and training are investments that increase productivity and income. The Endogenous Growth Theory explains that human capital contributes to innovation, research, and technological progress, which are important for long-term economic growth. The Augmented Solow Model also shows that human capital is an important factor that explains differences in income and economic growth across countries.

The empirical literature also supports the positive relationship between human capital formation and economic development. Many empirical studies found that education, health, and skill development have a positive impact on economic growth. The literature also shows that the quality of education is more important than the quantity of education in promoting economic development. Recent studies also show that human capital contributes to technological innovation, research and development, and sustainable development.

However, the literature also shows that there are several research gaps, such as lack of studies on education quality, skills, innovation,

and sustainability, especially in developing countries. Therefore, there is a need for more research using advanced econometric methods and recent data to better understand the relationship between human capital formation and economic development.

The study also provides important policy implications. Governments should increase investment in education, health, skill development, and research and development. Policymakers should focus on improving the quality of education, promoting innovation, and reducing brain drain. Effective human capital development policies can help countries achieve higher economic growth and sustainable economic development.

In conclusion, human capital formation is a key driver of economic development. Countries that invest in human capital are more likely to achieve higher productivity, higher income, technological progress, and better living standards. Therefore, investment in human capital should be considered an important strategy for achieving long-term economic development and improving the quality of life of people.

References

Abbas, Q., & Foreman-Peck, J. (2008). Human capital and economic growth: Pakistan, 1960–2003. *The Lahore Journal of Economics, 13*(1), 1–27. https://doi.org/10.35536/lje.2008.v13.i1.a1

Abdullah, A., Doucouliagos, H., & Manning, E. (2015). Does education reduce income inequality? A meta-regression analysis. *Journal of Economic Surveys, 29*(2), 301–316. https://doi.org/10.1111/joes.12056

Abmann, C. (2008). Assessing the effect of current account and currency crises on economic growth. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.1081402

Abramovitz, M. (1986). Catching up, forging ahead, and falling behind. The Journal of Economic History, 46(2), 385–406. https://doi.org/10.1017/S0022050700046209

Aghion, P., & Howitt, P. (1992). A model of growth through creative destruction. Econometrica, 60(2), 323–351. https://doi.org/10.2307/2951599

Akpolat, A. G. (2014). The long-term impact of human capital investment on GDP: A panel cointegrated regression analysis. *Economic Research International*. https://doi.org/10.1155/2014/646518

Ali, M., Egbetokun, A., & Memon, M. H. (2018). Human capital, social capabilities, and economic growth. *Economies, 6*(1), Article 2. https://doi.org/10.3390/economies6010002

Amaghionyeodiwe, L. A. (2009). Government health care spending and the poor: Evidence from Nigeria. *International Journal of Social Economics, 36*(3), 220–236. https://doi.org/10.1108/03068290910932729

Anyanwu, J. C. (2014). Factors affecting economic growth in Africa: Are there any lessons from China? *African Development Review, 26*(3), 468–493. https://doi.org/10.1111/1467-8268.12105

Arrow, K., Dasgupta, P., Goulder, L., Daily, G., Ehrlich, P., Heal, G., & Walker, B. (2004). Are we consuming too much? *Journal of Economic Perspectives, 18*(3), 147–172. https://doi.org/10.1257/0895330042162377

Auerbach, P., & Green, F. (2025). Reformulating the critique of human capital theory. *Journal of Economic Surveys*, *39*(5), 1839-1851.

Bambi, P. D. R., & Pea-Assounga, J. B. B. (2025). Unraveling the interplay of research investment, educational attainment, human capital development, and economic advancement in technological innovation: A panel VAR approach. *Education and information technologies*, *30*(3), 3309-3341.

Barro, R. J., & Lee, J.-W. (1993). International comparisons of educational attainment. *Journal of Monetary Economics, 32*(3), 363–394. https://doi.org/10.1016/0304-3932(93)90023-9

Becker, G. S. (1962). Investment in human capital: A theoretical analysis. *Journal of Political Economy, 70*(5), 9–49. https://doi.org/10.1086/258724

Benhabib, J., & Spiegel, M. M. (1994). The role of human capital in economic development: Evidence from aggregate cross-country

data. *Journal of Monetary Economics, 34*(2), 143–173. https://doi.org/10.1016/0304-3932(94)90047-7

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

Blankenau, W. F., Simpson, N. B., & Tomljanovich, M. (2007). Public education expenditures, taxation, and growth. *American Economic Review, 97*(2), 393–397. https://doi.org/10.1257/aer.97.2.393

Dessus, S. (2001). Human capital and growth: The recovered role of education systems. *World Bank Policy Research Working Paper*. https://doi.org/10.1596/1813-9450-2632

Devarajan, S., Swaroop, V., & Zou, H.-F. (1996). The composition of public expenditure and economic growth. *Journal of Monetary Economics, 37*(2), 313–344. https://doi.org/10.1016/S0304-3932(96)90039-2

Easterly, W., & Levine, R. (2001). It's not factor accumulation: Stylized facts and growth models. *World Bank Economic Review, 15*(2), 177–219. https://doi.org/10.1093/wber/15.2.177

Engelbrecht, H. J. (1997). International R&D spillovers, human capital, and productivity. *European Economic Review, 41*(8), 1479–1488. https://doi.org/10.1016/S0014-2921(96)00046-3

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

Heckman, J. J. (2000). Policies to foster human capital. *Research in Economics, 54*(1), 3–56. https://doi.org/10.1006/reec.1999.0225

Kanayo, O. (2013). The impact of human capital formation on economic growth in Nigeria. *Journal of Economics, 4*(2), 121–132. https://doi.org/10.1080/09765239.2013.11884972

Kiran, B. (2014). Educational expenditures and economic growth: Evidence from Latin America. *Quality & Quantity, 48*(3), 1181–1190. https://doi.org/10.1007/s11135-013-9828-2

Leoni, S. (2025). A historical review of the role of education: From human capital to human capabilities. *Review of Political Economy*, *37*(1), 227-244.

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

Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A contribution to the empirics of economic growth. *Quarterly Journal of Economics, 107*(2), 407–437. https://doi.org/10.2307/2118477

Mehrara, M., & Musai, M. (2013). Economic growth and human capital in developing countries. *International Letters of Social and Humanistic Sciences, 5*, 55–62. https://doi.org/10.18052/www.scipress.com/ILSHS.5.55

Mincer, J. (1958). Investment in human capital and personal income distribution. *Journal of Political Economy, 66*(4), 281–302. https://doi.org/10.1086/258055

Oketch, M. O. (2006). Determinants of human capital formation and economic growth. *Economics of Education Review, 25*(5), 554–564. https://doi.org/10.1016/j.econedurev.2005.07.003

Palani, P. M., Ahmed, Y. A., Yaqub, K. Q., Salih, A. M., & Mohammed, B. A. (2025). Rethinking economic growth: Integrating environmental constraints into growth theories. *International Journal of Scientific Research and Modern Technology*, *4*(2), 49-55.

Pelinescu, E. (2015). The impact of human capital on economic growth. *Procedia Economics and Finance, 22*, 184–190. https://doi.org/10.1016/S2212-5671(15)00258-0

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

Rahman, M. (2011). Education, health expenditure, and GDP in Bangladesh. *International Journal of Economics and Finance, 3*(3). https://doi.org/10.5539/ijef.v3n3p149

Romer, P. M. (1990). Endogenous technological change. *Journal of Political Economy, 98*(5), S71–S102. https://doi.org/10.1086/261725

Solow, R. M. (1956). A contribution to the theory of economic growth. *Quarterly Journal of Economics, 70*(1), 65–94. https://doi.org/10.2307/1884513

Temple, J. (1999). The new growth evidence. *Economics Letters, 65*(1), 131–134. https://doi.org/10.1016/S0165-1765(99)00120-2

Uzawa, H. (1965). Optimum technical change in an aggregative model. *International Economic Review, 6*(1), 18–31. https://doi.org/10.2307/2525621

Weiss, A. (1995). Human capital vs. signaling explanations of wages. *Journal of Economic Perspectives, 9*(4), 133–154. https://doi.org/10.1257/jep.9.4.133

Cite this article as: Mahesh Kumar Zala., (2026). Human Capital Formation and Economic Development: A Review of Theoretical and Empirical Literature. International Journal of Emerging Knowledge Studies. 5(3), pp. 386–399. https://doi.org/10.70333/ijeks-05-04-002