

## Comprehensive Review of the Literature on Human Capital in the Context of Economic Development

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### Abstract

This work aims to explore the relationship between human capital and economic growth. The study looks at previous research on the connection between economic growth and human capital, analyses datasets from other studies, and draws some conclusions. The paper summarises articles on human capital concerning (i) the new endogenous theory, (ii) the neo-classical growth model, (iii) the economist growth production, (iv) the conceptual framework of economic growth theory, and (v) empirical evidence on the relationship and causal connection between human capital and economic growth. Assessing the corpus of research on human capital and economic growth will yield an extensive literature guide for creating short- and long-term developmental goals for any region, as well as for creating and carrying out policies.

Keywords: Human capital, Economic growth, Education, Training, Health

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### Introduction

In the 1964 book "Human Capital" by Gary Becker, He asserts that human capital is essentially a tool for production and that it is impacted by things like access to healthcare, education, and training. Increased human capital can be used as an explanation for the pay gap among graduates. Additionally important is the impact of human capital on the rates of economic growth. Achieving sustainable economic growth that incorporates environmentally sound development is a more important macroeconomic objective (United Nations, 2020). This is

because it maximizes the use of non-renewable resources while ensuring the availability of renewable resources.

People's abilities and skills could be referred to as "human capital." The United Nations (2009) defines productive wealth that is ingrained in labor, skills, and knowledge. Part of this knowledge—when combined with human knowledge—is acquired through both official and informal education. The human capital theory also emphasizes an individual's health as an input to economic production. Human capital development, or spending on education or training as a proxy, refers to the acquisition and growth of the number of people who have the skills, knowledge, and experience that are essential for a nation's economic development (Adelakun, 2019). This study's primary contribution to the body of knowledge on economic development, stability, and growth is its thorough literature review.

The continuity and best use of these resources support the definition of development given by Arrow et al. (2004) as "meeting the requirements of now without compromising the ability of the subsequent generation to satisfy their own needs"; after all, our resources are loans from our children, not gifts. Human capital is a prerequisite for this to take place. Theoretical and empirical economic literature both contain evidence that points to the significance of education for economic growth. The notion that labor productivity contributes to the creation of a surplus of wealth was first advanced by Adam Smith and other eighteenth-century economists and philosophers. Klenow and Rodriguez-Claire (1997), Hall and Jone (1997), and Easterly and Levine (2001) all built on these theories. The organization claimed that the majority of the wealth gap between countries can be attributed to variations in the pace of technological advancement, which is the primary driver of growth. To achieve technical transformation, a country needs to engage in innovation or replication activities that primarily use human capital as its input of interest, according to Nelson and Phelps (1996), Romer, P. (1989, 1990), and Abramovitz (1986).

### *Evolution as a concept*

The concept of human capital refers to the skills, knowledge, abilities, and experience possessed by individuals that contribute to their productivity and economic value. It is a term that emerged in the late 19th century and has been further developed and explored by various economists and scholars over the years. Irving Fisher, in 1897, introduced the term "human capital" as the abilities and skill sets of human beings. This notion emphasizes that individuals possess valuable qualities that can be seen as asset or capital. The United Nations, in 2009, expanded on the concept by stating that human capital is acquired through formal and informal education. This indicates that education plays a significant role in the development of human capital. Gary Becker, in 1964, further developed the idea by asserting that human capital is determined by various factors such as education, training, and medical treatment. He viewed human capital as a means of production, suggesting that individuals' skills and knowledge can be utilized to generate economic output. Adelakun, in 2019, highlighted that the acquisition and increase in the number of individuals with critical skills, knowledge, and experience are essential for the economic growth of a country. This perspective emphasizes the importance of human capital for national development.

Klenow and Rodriguez-Claire (1997), Hall and Jones (1997), and Easterly and Levine (2001) argued that technological change is a primary driver of economic growth, and differences in the rate of technological change contribute to income disparities among countries. These scholars emphasized the role of technological progress in shaping economic outcomes. Nelson and Phelps (1996), Romer (1989, 1990), and Abramovitz (1986) posited that countries need to engage in innovation or imitation activities to achieve technological change. They emphasized that human capital plays a crucial role in these processes, serving as the main input for innovation and technological advancement. Mankiw, Romer, and Weil (1992) and Lucas (1988) argued that

investment in education has a positive effect on both individual human capital and the overall economy. They highlighted the connection between education, human capital formation, and economic growth. Hanushek and Woessmann (2015) emphasized that human capital is an input in the production process, implying a relationship between human capital and economic growth. Their research supports the idea that a well-educated and skilled population contributes to economic development. Overall, these perspectives collectively highlight the significance of human capital in driving economic growth, and technological progress, and reducing income disparities among countries. They underscore the importance of education, training, and investments in human capital development as critical factors for individual and national prosperity.

Table 1. Concept Historical Perspectives

|                                                                                          |                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Irving Fisher, 1897                                                                      | The term “human capital” can be described as the abilities and skill sets of human beings                                                                                                 |
| United Nations (2009)                                                                    | Integrated with humans, is acquired partly through formal and informal education.                                                                                                         |
| Gary Becker (1964)                                                                       | Human capital is determined by education, training, and medical treatment, and is effectively a means of production.                                                                      |
| Adelakun, 2019                                                                           | Acquisition and an increase in the number of persons who have the skills, knowledge, and experience that are critical for the economic growth of a country                                |
| Klenow and Rodriguez-Claire (1997), Hall and Jone (1997), and Easterly and Levine (2001) | Asserted that technological change is the primary source of growth and that differences in the rate of technological change are the principal causes of income disparity among countries. |
| Nelson and Phelps (1996), Romer, P. (1989, 1990), and Abramovitz (1986)                  | posited that to achieve technological change, a country must engage in innovation or imitation activities that use mainly human capital as their input of interest.                       |
| Mankiw, Romer, and Weil (1992) and Lucas (1988)                                          | Investment in education would have a positive effect on both the individual human capital and the overall economy.                                                                        |
| Hanushek and Woessmann’s (2015)                                                          | Human capital, is an input in the production process, implying that there is a relationship between human capital and economic growth.                                                    |

Source: Researcher Own Meta-analysis, 2023

Amaghionyeodiwe (2009) and Chaudry and Rahman (2009) argue that human capital is crucial for an economy to effectively manage its other factors of production, such as physical capital and natural resources. They also emphasize that human capital is necessary for driving innovation, as skilled and knowledgeable individuals are more likely to develop new ideas and technologies. Liap, Du, Bing, and Yu (2019) and Khembo and Tchereni (2013) assert that the growth of an economy is influenced by both its level of physical capital (such as infrastructure, machinery, and equipment) and human capital. They suggest that substantial investment in human capital is essential for achieving sustained economic development. In other words, a country cannot expect long-term economic growth and progress without significant investments in developing the skills, knowledge, and abilities of its workforce.

Akpolate (2014) and Kanayo (2013) highlight that the adoption of existing technologies, as well as technological advancement and catch-up processes, are contributing factors to the rate of economic growth. These scholars imply that human capital plays a vital role in these processes,

as a skilled and educated workforce is better equipped to utilize and adapt technologies effectively, leading to increased productivity and economic growth. In summary, these perspectives emphasize that human capital is necessary for managing factors of production, driving innovation, and achieving sustained economic development. They underline the importance of investing in human capital development as a crucial component of economic growth and highlight the role of human capital in technological adoption, advancement, and catch-up processes.

Table 2. Human Capital and Economic Growth

|                                                               |                                                                                                                                                                                                                          |
|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Amaghionyeodiwe (2009),<br>Chaudry and Rahman (2009),         | Human capital determines the ability of an economy to manage its other factors of production, and it is necessary for innovation.                                                                                        |
| Liap, Du, Bing, and Yu (2019),<br>Khembo and Tchereni (2013), | Growth of any economy is influenced by its level of physical and human capital. Hence, there is no country capable of achieving a sustained economic development path without a substantial investment in human capital. |
| Akpolate (2014) and Kanayo (2013).                            | Adopting existing technologies, technological advancement, and catch-up processes are contributing factors to the rate of growth of an economy.                                                                          |

Source: Researcher Own Meta-analysis, 2023

The human capital theory, developed by economists Theodore Schultz and Gary Becker in the 1950s and 1960s, views human capital as a form of capital that can be invested in and yields additional outputs. According to this perspective, investment in human capital, such as education and training, contributes to economic growth and productivity. In the neoclassical (or Solow) growth model, as described by Mankiw, Romer, and Weil in 1992, human capital is considered a factor of production alongside physical capital. The growth of human capital is believed to increase the marginal product of physical capital, leading to further accumulation of physical capital and ultimately raising total output. The endogenous growth model, proposed by Paul Romer in 1986 and Robert Lucas in 1988, suggests that the accumulation of human capital, or knowledge, is the main driver of economic growth. It posits that differences in living standards among nations are primarily attributed to disparities in human capital.

The neo-classical growth model, developed by Robert Solow and Trevor Swan in 1950, states that long-run economic growth is achieved through a combination of factors, including capital accumulation, skilled labor, population growth, and technological progress. In the new endogenous theory, as introduced by Romer in 1994 and discussed by Stonier and Hague in 1972, the focus is on the relationship between capital, labor, and output. This theory highlights the importance of capital accumulation (savings) and how it is utilized by individuals and institutions to drive economic growth. Overall, these theories provide different perspectives on the role of human capital and its relationship with economic growth. They emphasize the significance of investing in human capital, knowledge accumulation, and the interplay between capital, labor, and output in fostering long-term economic development.

Table 3. Theoretical Meta-analysis

|                                             |                                        |                                                                                                                                                                     |
|---------------------------------------------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Human capital theory<br>1950s and 1960s,    | Theodore<br>Schultz and<br>Gary Becker | Human capital can be seen as a means of production – into which investment yields additional outputs. As Becker notes:                                              |
| NEO-CLASSICAL<br>(OR SOLOW)<br>GROWTH MODEL | Mankiw,<br>Romer and<br>Weil (1992)    | Human capital is a factor of production along with physical capital. In other words, human capital growth would raise the marginal product of physical capital, and |

|                            |                                              |                                                                                                                                                                                                                                                                              |
|----------------------------|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            |                                              | thus induce further accumulation of physical capital, thereby raising the total output                                                                                                                                                                                       |
| ENDOGENOUS GROWTH MODEL    | Paul Romer (1986) and Robert Lucas (1988).   | “The main engine of growth is the accumulation of human capital-of knowledge-and the main source of differences in living standards among nations is differences in human capital.                                                                                           |
| Neo-classical Growth Model | 1950, Robert Solow and Trevor Swan           | The Solow growth model states that long-run growth is achieved through capital accumulation, skilled labor, population growth, and technological progress.                                                                                                                   |
| New Endogenous Theory      | Romer, P. (1994) and Stonier and Hague (1972 | The neo-classical growth model assumes that the accumulation of capital (savings) in an economy and how people utilize this capital is vital for economic growth. This model shows the relationship between capital and labor and how capital and labor translate to output. |

Source: Researcher own Meta-analysis, 2023

## Methodology

The process of reviewing the literature was done using the PRISMA method. PRISMA is a minimal set of items that must be reported in evidence-based systematic reviews and meta-analyses. PRISMA is mainly focused on reporting reviews that evaluate the effects of interventions, but it can also be used as a basis for reporting systematic reviews with objectives. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement was developed in 2009 to help systematic reviewers be more transparent about the goals of their reviews, the steps they took, and the findings they came to. Over the past ten years, advances in terminology and systematic review methodology have necessitated an update to the guideline.

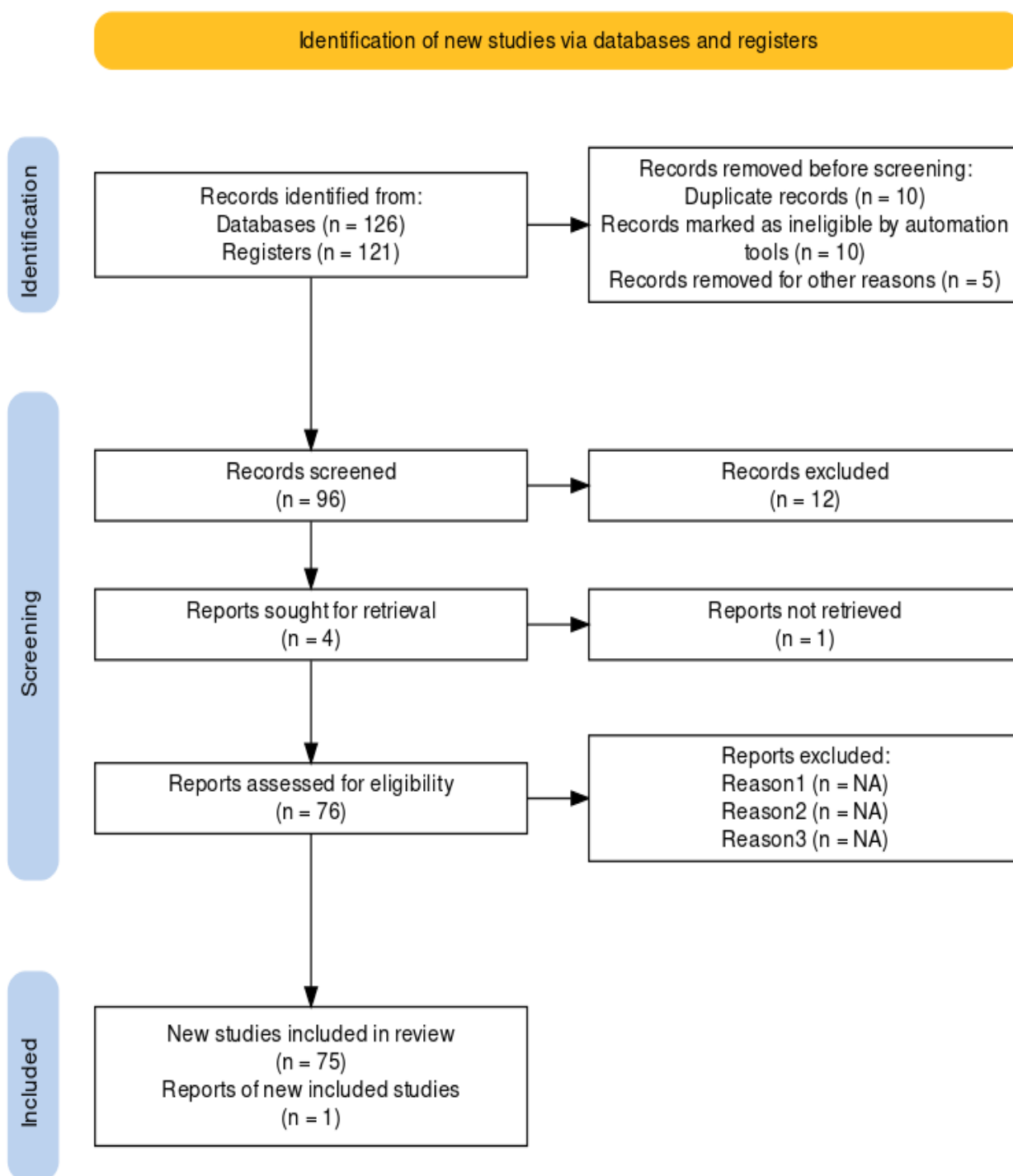


Figure 1. PRISMA 2023

The 2009 statement is replaced by the PRISMA 2020 statement, which also includes new reporting guidelines reflecting improvements in finding, picking, evaluating, and synthesizing studies. To make implementation easier, the items' organization and presentation have been changed. The PRISMA 2020 abstract checklist, the expanded checklist with reporting guidelines for every item, the PRISMA 2020 27-item checklist, and the updated flow diagrams for the original and updated reviews are all presented in this article.

## Results

Table 4. Partial Correlation/ Combined Effect Size

| #                    | Study name                 | Partial Correlation | CI Lower limit | CI Upper limit | Weight |
|----------------------|----------------------------|---------------------|----------------|----------------|--------|
| 1                    | Abdullah et al., 2020      | 0.36                | 0.17           | 0.56           | 9.90%  |
| 2                    | Edrees (2020)              | 0.78                | 0.63           | 0.94           | 13.30% |
| 3                    | Soumere (2020)             | 0.64                | 0.24           | 1.03           | 3.16%  |
| 4                    | Christa & Kristinae, 2021  | 0.68                | 0.60           | 0.75           | 24.88% |
| 5                    | Ramadani et al., 2018      | 0.65                | 0.57           | 0.73           | 24.00% |
| 6                    | Pramuki & Kusumawati, 2021 | 0.65                | 0.57           | 0.72           | 24.75% |
| Combined Effect Size |                            |                     |                |                |        |
| Partial Correlation  |                            | 0.64                |                |                |        |
| CI Lower limit       |                            | 0.52                |                |                |        |
| CI Upper limit       |                            | 0.76                |                |                |        |
| Z-value              |                            | 13.91               |                |                |        |
| One-tailed p-value   |                            | 0.000               |                |                |        |
| Two-tailed p-value   |                            | 0.000               |                |                |        |

Source: Meta Essentials (2023)

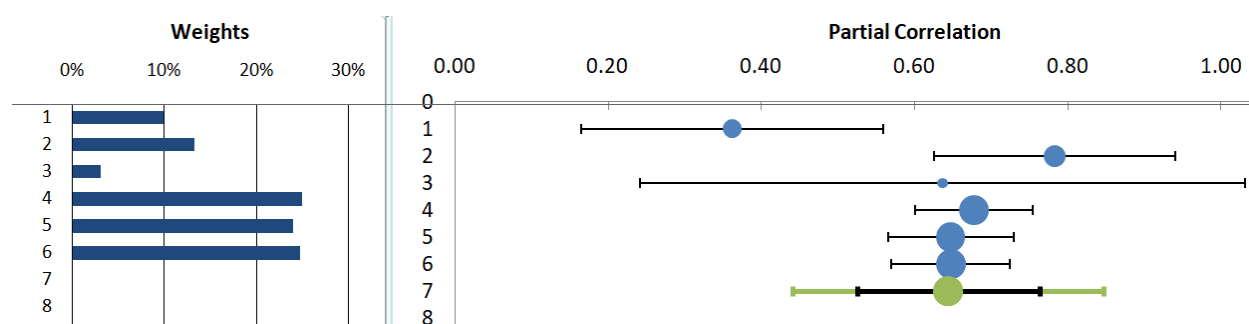


Figure 2. Forest Plot, Source: Meta Essentials (2023)

The table you provided presents the partial correlation coefficients, confidence intervals, and weights for several studies examining the relationship between variables (not specified in the table). The combined effect size is also reported. Here's a breakdown of the information: Abdullah et al., 2020: The partial correlation coefficient is 0.36, with a confidence interval (CI) ranging from 0.17 to 0.56. The weight assigned to this study is 9.90%. Edrees (2020): The partial correlation coefficient is 0.78, with a CI ranging from 0.63 to 0.94. The weight assigned to this study is 13.30%. Soumere (2020): The partial correlation coefficient is 0.64, with a CI ranging from 0.24 to 1.03. The weight assigned to this study is 3.16%. Christa & Kristinae, 2021: The partial correlation coefficient is 0.68, with a CI ranging from 0.60 to 0.75. The weight assigned to this study is 24.88%. Ramadani et al., 2018: The partial correlation coefficient is 0.65, with a CI ranging from 0.57 to 0.73. The weight assigned to this study is 24.00%. Pramuki & Kusumawati, 2021: The partial correlation coefficient is 0.65, with a CI ranging from 0.57 to 0.72. The weight assigned to this study is 24.75%.

The combined effect size, calculated based on the weighted average of the individual studies, is a partial correlation coefficient of 0.64, with a lower CI limit of 0.52 and an upper CI limit of 0.76. The Z-value is 13.91, indicating a statistically significant relationship. The one-tailed p-value and two-tailed p-value are reported as 0.000, indicating a highly significant relationship.

Please note that without additional context or information about the variables being studied, it is challenging to provide further interpretation or analysis of these results.

Table 5. Variance of the True Effect Sizes

|                                               |       |
|-----------------------------------------------|-------|
| Combined effect size                          | 0.81  |
| T <sup>2</sup> (method of moments estimation) | 0.02  |
| R <sup>2</sup>                                | 3.99% |

Source: Meta Essentials (2023)

According to the information provided from Meta Essentials (2023), Table 5 displays the variance of the true effect sizes. Here are the reported values: Combined effect size: The combined effect size is reported as 0.81. This represents the aggregated estimate of the true effect sizes across the studies included in the analysis. T<sup>2</sup> (method of moments estimation): T<sup>2</sup> is estimated to be 0.02. T<sup>2</sup> is a measure of the between-study variance or heterogeneity in effect sizes. A smaller T<sup>2</sup> indicates less variability between studies. R<sup>2</sup>: R<sup>2</sup> is reported as 3.99%. R<sup>2</sup> represents the proportion of the total variance in effect sizes that can be attributed to heterogeneity or differences between studies. In this case, 3.99% of the variance is attributed to heterogeneity. These measures provide insights into the variability and heterogeneity of the true effect sizes in the meta-analysis. The combined effect size of 0.81 suggests a consistent relationship, while the T<sup>2</sup> and R<sup>2</sup> values indicate the degree of heterogeneity among the studies.

## Discussion

Previous studies have measured intellectual capital and the effects of its components on firm performance using data from 21 insurance companies. They have also confirmed the link between increased human capital efficiency and improved company performance. They found that human capital efficiency has a big impact on how effective financial institutions are. Furthermore, a positive correlation between human capital and the interest of potential students was found (Boson et al., 2023). Examining the impact of intellectual property on the financial stability of 710 Indian businesses between 2001 and 2016. The results demonstrated that although the productivity of a company is greatly influenced by the efficiency of its human capital, the productivity of its employed capital and structural capital is also significantly impacted by these factors (Ployhart, 2021). To determine how intellectual capital—which encompasses human, social, and organizational capital—affects business performance, a survey of 213 coffee cooperatives was conducted. They concluded that social and human capital is essential for a firm's success based on exploratory, confirmatory, and moderating factor analyses (Gupta & Raman, 2021).

Tuncdogan et al. (2021) carried out a big data study to examine the relationship between three firm performance measures—ROA, ROE, and Tobin's Q—and the three components of intellectual capital—human capital efficiency, structural capital efficiency, and capital employed efficiency—of 171 listed companies on the Saudi stock exchange. The results showed that human capital efficiency has a significant positive impact on ROE. Comparable to this, Rahim et al. (2017) investigated 55 Malaysian technology companies back in 2009. The results showed a strong and positive relationship between firm performance and human capital efficiency (Shiferaw et al., 2023). Using multiple linear regression models, Kwarbai and Akinpelu (2016) investigated the impact of human capital efficiency on firm performance at manufacturing companies listed on the Stock Exchange Market (Panigrahi et al., 2023). They found that there is a negative correlation between human capital efficiency and employee base expansion and a significant positive correlation between human capital efficiency and ROA and earnings per share. Data on 29 coffee

processing companies was gathered by Parham and Heling (2015) to assess the effect of human capital efficiency on business performance. Their study shows a positive correlation between the three measures of business success (ROA, ROE, and employee productivity) and human capital efficiency.

A study conducted at 22 African coffee cooperatives examined the connection between human capital efficiency and four metrics. The primary discovery of the paper is the correlation between employee productivity and human capital efficiency. Furthermore, 145 coffee cooperatives had a positive foundational impact on the efficiency of their human, relational, and structural capital. They concluded that structural capital efficiency has a significant effect on performance, in contrast to relational and human capital efficiency. Additionally, it was observed that a company's financial performance is influenced by its human capital. Businesses are starting to pay more and more attention to human capital. Furthermore, over time, the disclosure of human resources has changed to incorporate more comprehensive data and coherent formats (Gobena & Kant, 2022).

## Conclusion

The study's objective was to give readers, economists, and policymakers a thorough introduction to the economic growth theory. In relation to (the) new endogenous theory, (iv) the Solow growth production-function, (iii) the neo-classical growth model, (iv) the theoretical framework of economic growth theory, and (v) empirical evidence on the relationship and causal link between human capital and economic growth, this paper summarises articles on human capital. Assessing the corpus of research on human capital and economic growth will yield an extensive literature guide for creating short- and long-term developmental goals for any region, as well as for creating and carrying out policies.

## Conflict of Interest

No conflicts of interest.

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