

# Role of Education and Skill Development as a Measure of Human Capital in India

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## Abstract

This paper investigate that how education and skill development affect the employability, trade and productivity in India. Using secondary data from government papers, international agencies, academic research, and industry surveys, this study looked at how education and skill development function as indicators of human capital in India. According to the review, education and skills are interrelated aspects of human capital that have a big impact on macroeconomic growth, employment opportunities, and individual earnings. Human capital is built on education, which has been shown to have both social and private benefits over time. However, its full potential is limited by disparities depending on industry opportunity, geography, and gender. Especially in light of globalisation, digital transformation, and changing labor market demands, skill development has become a dynamic and complementary element. Despite advancements, problems like disparities in quality, underemployment of skilled workers, and a misalignment between market demand and educational outputs continue to exist. All things considered, the results show that India's human capital generation calls for a well-rounded strategy that supports ongoing skill development, improves formal education, tackles inequality, and forges closer relationships with business and commerce.

**Keywords-** Education, Human Capital, Skill Development, India

## I. Introduction

It has long been acknowledged that human capital plays a crucial role in determining social development, productivity, and economic growth. Investments in education and skills improve individual capacities, increase wages, and contribute to national prosperity, according to the seminal writings of Schultz (1961) and Becker (1964). The importance of human capital is especially noticeable in the Indian context. India has a distinct demographic dividend due to its population of over 1.4 billion people, many of whom are in the working age range. However, the quality of education and the availability of chances for skill development determine how

much of this demographic advantage is translated into economic growth.

Through the development of literacy, knowledge, and critical thinking, education offers the fundamental basis for human capital. India has increased access to education over the last 20 years, as seen by growing gross enrolment ratios and literacy rates. However, inequalities persist across socioeconomic, geographic, and gender categories, restricting education's capacity to be inclusive. At the same time, the need for ongoing reskilling and vocational training has grown due to the rise of globalisation, digital technology, and artificial intelligence. In order to build a workforce that can handle the problems of the

twenty-first century, the Indian government has recognised this and launched programs like the National Education Policy 2020, Digital India, and the Skill India Mission.

The development of skills has become a vibrant addition to formal education. Nearly 88% of Indian workers believe that upskilling is essential to their career advancement, according to industry polls (Economic Times, 2023). Along with soft talents like collaboration and communication, employers are also placing a higher value on technological abilities like coding, data science, and artificial intelligence (LinkedIn Pulse, 2023). These advancements demonstrate that skill development is not just a social but also an economic necessity, having a direct impact on India's trade performance, competitiveness, and productivity.

Problems still exist in spite of these developments. The best possible development of human capital is hampered by school quality inequalities, the low employability of skilled workers, regional differences in training access, and the predominance of the unorganised sector. Inequalities in gender further limit India's workforce's potential for growth. The necessity for a thorough grasp of how education and skill development work together to shape India's human capital, which in turn influences its economic growth and trade competitiveness, is highlighted by these gaps. The current study aims to examine how education and skill development function as indicators of human capital in India in light of this. To highlight trends, issues, and policy implications, the study will synthesise secondary data from industry surveys, academic research, international indexes, and government papers. In addition to the inherent worth of education and skills, the emphasis is on how they have shaped India's place in the world economy.

## **II. Literature Review**

### *A. Introduction and background of the study*

Since the writings of Schultz (1961) and Becker (1964), who highlighted that investments in education and skills increase productivity, incomes, and economic growth, the idea of human capital has been fundamental to economic theory. It is commonly acknowledged that human capital generation is an essential factor in promoting equitable growth and global competitiveness in the Indian context, where the demographic dividend poses both opportunities and challenges. Through reading, schooling, and higher education, education creates the fundamental stock of human capital, and skill development improves employability and flexibility in a labor market that is changing quickly. They work together to create complementary human capital elements that have a direct impact on India's social development, trade competitiveness, and productivity. The theoretical framework for this review is provided by human capital theory. It makes the assumption that, like tangible capital investments, education and skill development are investments that raise future income and productivity. According to this viewpoint, analysing education and skill development as measures of human capital is crucial for comprehending the results of India's labor market as well as determining how ready the country is for international commerce, digital transformation, and structural economic changes.

### *B. Education and Skills in India's Development*

India has prioritised education and skill development in its policy discussions. The World Bank (2023) views the development of human capital as a key component of its work in India, emphasising the importance of healthcare, education, and skill investments as necessary for both poverty alleviation and sustainable growth. Building a workforce prepared for both established industries and cutting-edge fields like information technology, artificial intelligence,

and renewable energy is the goal of national programs like the National Education Policy (NEP 2020), the Skill India Mission, and Digital India. India's need to increase the number and caliber of its educational outcomes and vocational training coverage is continuously highlighted by international indices like the Human Capital Index and the Human Development Index. In the Indian context, these frameworks offer a policy backdrop that validates the study of education and skills as indicators of human capital. The beneficial effects of education in India have been demonstrated by a substantial body of literature. More years of education increase incomes, with higher secondary and postsecondary education producing very large returns, according to studies employing labor force statistics and household surveys (Kingdon, 2020). Analysis of panel data shows that education increases productivity at the macroeconomic level and intergenerational mobility in addition to raising individual salaries (Azam & Kingdon, 2019). The variety of returns is further highlighted by recent research. Men experience larger returns to schooling than women do, and the difference between formal and informal work is more noticeable in urban than rural locations (Saha, 2020). To deal with endogeneity, some research employ Mincerian wage equations, while others use instrumental variable techniques; yet, both approaches indicate strong beneficial impacts. Gender differences in schooling have significant socioeconomic ramifications that extend beyond individual incomes. Sub-national research employing panel regressions demonstrates that closing gender inequalities in schooling results in quantifiable gains in regional production growth (Klasen & Lamanna, 2009). Women's unequal access to education not only restricts their own economic prospects but also lowers the possibility for state and regional prosperity as a whole. According to this body of research, gendered inefficiencies may go unnoticed if human capital is only assessed

using overall schooling metrics. Therefore, it is crucial to include gender considerations in evaluations of human capital, especially for India, where women's labor force participation is still low despite increases in their educational attainment. However, formal schooling is only one aspect of human capital. According to empirical research conducted in India, social capital and labor market experience have an impact on incomes as well. Mishra and Smyth (2015), for instance, demonstrate how networks and unofficial ties frequently influence career advancement and job placement, especially in the unorganised sector. According to research that integrates social capital, experience, and education, these factors interact and yield varying returns based on labor market structure and social context. This has two significant ramifications. First and foremost, skill development must be acknowledged as a dynamic addition to formal education, whether it be through certification programs, employer-sponsored courses, or vocational training. Second, assessing human capital in India necessitates taking into account both official credentials and informal factors like social networking and training adoption. The increasing demand for skill development in India is highlighted by recent labor market surveys. The Economic Times (2023) reported on a Pearson Skills Outlook poll that found that around 88% of Indian workers believe that ongoing upskilling is crucial to professional success. Additionally, employers are spending more money on workforce training, giving priority to soft skills like communication, teamwork, and problem solving as well as technological capabilities like data science, artificial intelligence, and coding (LinkedIn Pulse, 2023; HR Economic Times, 2020). This trend has been exacerbated by the COVID-19 epidemic and the speed at which digital transformation is occurring. Companies that spend in training are better positioned to compete in international markets, and workers are

expected to reskill several times over their careers. These advancements highlight the usefulness of skill development as a quantifiable and policy-relevant factor.

### *C. Gaps of the study*

There are still a number of gaps in the research on education and skill development as indicators of human capital in India, despite a solid body of evidence:

- 1) *Limitations of measurement:* The majority of research use the highest degree earned or the number of years of education. Few include information on certifications, informal skill acquisition, or vocational training.
- 2) *Knowledge versus abilities:* Although the benefits of schooling are widely known, little is known about how short-term skill development programs compare in terms of productivity, exports, and firm performance.
- 3) *Sub-national and sectoral variation:* More detailed assessments are required to connect human capital metrics to trade performance or foreign direct investment inflows that are specific to a given industry.
- 4) *Interaction with social capital:* Research indicates that informal institutions and social networks influence educational and skill returns, although these factors are rarely included in measures of human capital.

### *D. Conclusion for the literature*

The literature unequivocally states that skill development and education are key indicators of human capital in India. Although education offers significant social and private benefits, its full potential is constrained by regional and gender inequality. In contrast, skill development has become a more important aspect of human capital

in response to changing labor market demands and technological advancements. These elements work together to support India's competitiveness in trade and business. The best way to quantify dynamic skill acquisition, the relationship between education and skills and social capital, and how these factors affect sectoral trade performance are all unresolved issues in the current research. In addition to providing insightful information for journals and policymakers interested in India's economic development, answering these issues would enhance theory and policy. Whereas, According to the literature, skill development and education are factors that affect economic competitiveness in addition to being social investments. A highly qualified workforce encourages innovation, boosts production, and draws in foreign capital. Additionally, the structure of India's exports is influenced by education and skills, as workforces with higher levels of education tend to shift economies toward high-value goods and services. Future studies can close a significant gap by relating the development of human capital to trade performance. Such research would demonstrate how expenditures on education and skill-building result in observable benefits for India's international economic integration.

### *E. Objectives of the study*

To investigate how education and skill development affect trade, employability, and productivity in India; to analyse them as measures of human capital.

## **III. Research Methodology**

### *F. Research design*

The research design used in this study is both descriptive and analytical. In order to investigate the function of education and skill development as indicators of human capital in India, it solely uses secondary data sources. While the analytical component critically assesses the connection

between human capital formation and economic growth, trade competitiveness, and employability, the descriptive component emphasises current trends and policies.

#### Data Sources

Secondary data was gathered from trustworthy and legitimate sources, such as:

- 1) *International organisations:* UNDP Human Development Reports, World Bank Human Capital Index.
- 2) *National reports:* updates from the Skill India Mission, NITI Aayog skill development reports, and Ministry of Education (AISHE, UDISE+).
- 3) *Research articles and journals:* Peer-reviewed studies on gender disparities and returns to education from Sage Journals, Indian Journal of Labour Economics, Economic Modelling, and other periodicals.
- 4) *Policy institutes:* reports on growth and education are published by the Indian School of Public Policy.
- 5) *Media and industry surveys:* Economic Times (2023) and HR Economic Times (2020) reports on labor market trends and skill development.
- 6) *Development projects and NGOs:* Asia Initiatives, which emphasises the importance of social capital in addition to education and skills.

#### G. Variables for the study

The study measure the concept of Human Capital through two variables mainly:

- Education based on literacy rate, average years of education, the gender parity index in education, and the gross enrolment ratio (GER) in higher education.

- Skills development based on the quantity of people trained under the Skill India Mission Participation in technical or vocational courses; employer-led training programs; and documented trends in upskilling (based on survey data from ET & HR Times). The relevance of skill development as perceived by employees (survey percentages).

#### H. Study Scope

- 1) *Geographic scope:* India (when data allows, state-level variance is mentioned).
- 2) *Time frame:* Information from the past 20 years (2000–2023) to account for both recent policy changes and long-term trends.
- 3) *Thematic scope:* With additions to gender, social capital, and trade competitiveness, the emphasis is on education and skill development and their combined function as indicators of human capital.

#### I. Limitations of the study

The accuracy of analysis may be limited by reliance on secondary data because datasets may differ in their definitions and methods of collection. The lack of primary field data restricts the study's capacity to record complex individual-level viewpoints. The findings are contingent on the validity and reliability of the sources given; the influence of unrecorded training and informal skill acquisition may be understated.

#### IV. Discussions

##### J. Significance of Education in Human capital

- 1) *Increasing literacy and enrolment:* Over the past 20 years, India has achieved significant strides in increasing both literacy and enrolment in higher education. As universities and colleges have grown, so too has the higher education sector's Gross Enrollment Ratio (GER).

- 2) *Unequal returns on education:* Research indicates that education considerably increases earnings, yet the returns differ by sector, gender, and location. Compared to workers in the rural and unorganised sectors, urban workers and those in formal employment gain more.
- 3) *Gender imbalance in education:* Despite progress in basic and secondary school, there are persistent disparities in higher education and technical fields. The full growth potential of India's human capital is diminished by these disparities.

*K. Skill Development provides growth*

- 1) *Prioritising upskilling:* According to surveys, around 88% of Indian workers believe that upskilling is essential to advancing their careers (Economic Times, 2023). This demonstrates the increasing acceptance of lifelong learning outside of the classroom.
- 2) *Employer-driven training:* According to LinkedIn Pulse (2023), businesses are placing a greater emphasis on reskilling in fields including digital literacy, artificial intelligence, data science, and communication skills. As a result, companies now view skill development as a strategic investment.
- 3) *Skill India progress:* Millions of people have been taught by national initiatives like the Skill India Mission, but there are still issues with guaranteeing the caliber, recognition of certifications, and employability of trainees.

*L. Social and Regional Dimensions*

- 1) *Regional disparities:* When compared to less developed states, states with superior infrastructure for education and training—such as Tamil Nadu, Kerala, and Maharashtra—display higher results in terms of human capital.

- 2) *Social capital:* Research indicates that networks and unofficial contacts influence employability and pay, particularly in the unorganised sector. This implies that metrics of education and training by themselves are insufficient to adequately capture human capital.
- 3) *Urban-rural divide:* While rural areas lack the availability and affordability of private training facilities, vocational schools, and higher education, urban areas enjoy greater access to these resources.

*M. Human capital and Economic Growth*

- Stronger regional output growth is correlated with higher educational attainment, according to panel studies. Higher GDP growth at the subnational level is closely correlated with less gender inequality in education.
- Trade competitiveness: Research shows that an educated and trained labor force boosts output and helps India shift to higher-value manufacturing and service-sector exports (such as IT, banking, and consulting).
- Employer demand-supply gap: Despite advancements, there is still a discrepancy between the competences required in the labor market and the abilities taught in school or training, especially in newly emerging technology-driven industries.

*N. Overall Discussion*

- Skill development has become a dynamic and complementary measure, giving workers relevant competencies in a quickly changing economy. Education is the cornerstone of human capital and continues to be the strongest predictor of individual income and employability.

- The ideal contribution of human capital to India's economy is still limited by gender inequity, geographical disparities, and a skills shortage.
- To fully utilise its demographic dividend and increase trade competitiveness, India will need to integrate social capital and inclusivity while bolstering formal education and ongoing skill development.

## V. Conclusion

Using secondary data from government papers, international agencies, academic research, and industry surveys, this study looked at how education and skill development function as indicators of human capital in India. According to the review, education and skills are interrelated aspects of human capital that have a big impact on macroeconomic growth, employment opportunities, and individual earnings. Human capital is built on education, which has been shown to have both social and private benefits over time. However, its full potential is limited by disparities depending on industry opportunity, geography, and gender. Especially in light of globalisation, digital transformation, and changing labor market demands, skill development has become a dynamic and complementary element. Despite advancements, problems like disparities in quality, underemployment of skilled workers, and a misalignment between market demand and educational outputs continue to exist. Furthermore, it is difficult to convert education and skills into quantifiable productivity increases in India due to the informal sector's persistent dominance. All things considered, the results show that India's human capital generation calls for a well-rounded strategy that supports ongoing skill development, improves formal education, tackles inequality, and forges closer relationships with business and commerce.

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