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EMPIRICAL ANALYSIS OF HUMAN CAPITAL'S INFLUENCE ON ECONOMIC GROWTH IN UTTAR PRADESH

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ABSTRACT

Both Human and physical capitals play an important part in defining a nation's level of economic success and growth.

Physical capital and human capital's contributions to the process of economic growth are contrasted. It makes a far bigger contribution than physical capital in some ways. Human capital may be used as a factor of production at the national level alongside physical capital. Its contribution to growth is far greater than the contribution of physical capital. Human capital is the amount of skills, knowledge and other attributes that people possess and that qualify them for being productive-according to OECD. Throughout lifetime, individuals invest in health, skills, and know-how so that they get the maximum output from lives and become productive for mankind. This paper is concerned with examining the nexus between human capital and economic growth in the state of Uttar Pradesh. The research work will adopt empirical data derived from multiple sources and uses it to analyze how education and health determine the regional-level economic performance. We examine the GSDP-GER nexus at all educational levels in order to determine the relationship between human capital and economic growth. While gross state domestic product refers to the market value of goods and services that could be produced within the state during a fiscal year, the gross enrollment ratio is a statistical measure used in education to estimate the extent of enrollment at various levels of education with reference to the population in the age group relevant to that educational level. This study aims to give a thorough grasp of how human capital contributes to regional economic growth and makes policy recommendations to support the state's sustainable development.The findings imply that human capital and economic growth are positively correlated, meaning that improving health and education is essential to increasing Uttar Pradesh's economic output and productivity. Human capital variables are found through the analysis.

Key words: Human capital, Economic Growth, GER, GSDP

I. INTRODUCTION

Growth of the economy is fundamentally driven by human resources, which is described as the combined skills, knowledge, and capacities of individuals. Most people agree that a major contributor to growth of the economy is human capital, which encompasses the skills, knowledge & talents of the workforce. According to the hypothesis, an educated and talented workforce promotes innovation, increases productivity, and speeds up economic growth. However, depending on regional differences in institutional quality, infrastructure, and regulatory frameworks, Human capital's impact on economic growth may vary significantly. Human capital development is essential to eradicating extreme poverty and fostering more inclusive societies. It is facilitated by investing in people through employment, training, health care, and nutrition (World Bank). According to Solow's neoclassical economic growth model, the only exogenous source of long-term growth of the economy is technological advancement. It also accounts for the sources of economic growth as a share of labor and capital. The majority of the remarkable increase in real earnings per worker can be attributed to the use of leisure time to advance knowledge and skills, which increases labor productivity (Schultz, 1961). Human capital is just as important to economic progress as physical capital, and in some situations, even more so. At the national level, human capital can be thought of as a factor of production that works in tandem with physical capital. Physical capital does not contribute as much to economic growth as human capital does, and vice versa. added that the expansion of human capital is a prerequisite for and an effect of economic expansion (Mincer, 1981). Long-term growth of the economy has been seen to be significantly influenced by human capital ever since the endogenous growth hypothesis was developed. Since human capital is the primary driver of economic development and outweighs the depreciation of physical capital in the production function, it is a type of capital that is not susceptible to diminishing returns and is included in the AK model of endogenous growth theory. Romer's endogenous growth model argues that a country's long-term economic growth is dependent on its endogenous technological improvement, which may be accomplished by investing in knowledge, human capital, and research and development to increase worker productivity and efficiency. The research further studies the broader impact on India's development and concludes that improving human capital in states like

Uttar Pradesh is important for attaining inclusive growth and reducing regional gaps.

Significance of the Research

In nations such as India, human resource is a important factors of economic expansion. India's youthful population constitutes a demographic dividend that is anticipated to drive economic expansion. This "window of demographic dividend" that India can avail upon is the fundamental justification behind all emphasis put upon human capital. "The economic growth potential that can arise from changes in population age structure, primarily when the share of working age population (15–64) is greater than the share of non-working age population (14 years and younger, 64 and older)," is the meaning of the phrase "demographic dividend." (UNFPA) with the world's youngest population living in India, its youngest population is by far its most precious asset. India is the world's most populated country with 1.44 billion people dwelling in it. Although these figures may seem challenging and burden the nation too much, its greatest benefit is that it has the lowest mean age of population (28.7) among the world's largest economies (China is at 38.4, the US is at 38.5). India is the only country with a longer demographic dividend opportunity, spanning five decades from 2005 to 2055. It is necessary to make significant investments in and improve the state of the human resources that are now accessible in order to maximize the benefits of the demographic dividend. In UP, which is among India's most populous and socio-economically varied states, understanding the effect of HC on EG offers important perspectives. Uttar Pradesh encounters distinct challenges, including a dense population, fluctuating literacy levels, inequalities in healthcare availability, and a dependence on agriculture and traditional sectors, all of which affect its economic environment. The analysis is supported by the fact that Uttar Pradesh is the most populated states in the country, accounting for 16.4% of all people. This group, which makes up 62.4 percent of the state's population, can have a big influence on the state's economic development. Stated differently, UP has a vast reservoir of human resource resources. In terms of GSDP, Uttar Pradesh rose to become the third-largest state in 2020–21. Thus, the objective of this research is to understand how EG and the state's majority working-age population share relate to each other. Human development includes raising people's standard of living and plays a major role in developing human capital, which makes a country's labor force

and manpower more productive in producing economic value on its own. By evaluating the connection between both EG & HC in UP, policy decisions on resource allocation in relevant sectors can be made, and the state's current human capital condition can be improved.

II. LITERATURE REVIEW

(Barro, 2001) Countries with higher initial levels of educational attainment expand more quickly for a given amount of initial GDP per capita and for variables linked to policy. this study find HC has a +ve impact on physical investment, a -ve impact on fertility, and a further positive impact on progress for a given investment & fertility value.

(Cooray, 2009) She investigated the connection b/w EG and the amount and quality of schooling in a sample of low- and middle-income nations. She found that the GER at the primary, secondary, and postsecondary levels are +ve correlated with EG. The impact of spending on growth is indirect, however, and depends on the relationship b/w government expenditure and quality characteristics.

(Jha and Ghatak, 2012) A one-way causal connection b/w per capita GDP and educational variables has been found in a study covering the period of 1960–2004. This relationship further explains why educational variables in India do not have a substantial impact on the economy's growth . Therefore, a threshold level of educational attainment is required to achieve economic growth from educational externalities, and this can be achieved by making significant investments in the educational sector.

(Pelinescu,2014) An insignificant relation b/w GDP and education spending in GDP for the years 2000–12 in European countries, but a +ve and substantial relationship between GDP, inventive potential of HC, and secondary education.

(Shukla, 2017) The research found the strong +ve correlation b/w the progress of GDP and Per capita health spending (0.98), gross capital formation (0.99), and secondary school enrollment (0.98) of India from 1995 to 2014. Further, the largest influence of economic growth in India is found in secondary school enrollment.

(Sharma,2017) study compares the status of education and health in India and China finds a one-way relation between public health expenditure and expansion of economy. The trend of health index being high suggests that the availability of hospital bed per 1000 life expectancy for India, out-of-pocket cost, and public health expenditures all have been having a favorable effect. Similar to how public education spending, educational attainment for those above 25, and patents have all positively impacted the education index since 2003, it is worthy of mention that public health and education spending in nations like India has considerably boosted per capita national income.

(Khan and Agrawal,2020) The influence of Human capital development on the Indian economy is estimated from a study made from 1995–1996 to 2013–2014. It found that primary and higher education both had a very +ve influence on EG, and that there was a highly substantial positive correlation of life expectancy with per capita health expenditure. On the other hand, infant mortality showed a highly negative correlation with economic growth.

Research Gap

The present research aims to study the relation b/w role of HC and EG in Uttar Pradesh for the period 2012-2020 and to assess which HC indicator has the highest impact on growth of the economy. A lot of research was already been carried out in reference to social expenditure and its role in human development and EG in India. In case of Uttar Pradesh some works have been done regarding assessment of demographic opportunities and challenges or human development in Uttar Pradesh. No such attempt has been made earlier in context of Uttar Pradesh so, the research on this topic might be helpful regarding policy making for the state and utilizing their resources in appropriate direction, thus their young population too.

III. RESEARCH OBJETIVE:

- To estimate the impact of health indicator & education indicators and its key role in economic growth.
- To analyse the connection b/w Expenditure of Education & health and growth of the economy.
- To suggest policy measures for the improvement of human capital.

Present research has adopted Descriptive research and correlation analysis. This research is entirely based on secondary data. Variables description are as follows: Per capita GSDP is the selected dependent variable and other independent variables which depict human capital are percentage of combined public expenditure of GDP on education and health in Uttar Pradesh. The proxy variables for education human capital are GER of students at senior secondary and tertiary level and to estimate health human capital infant mortality rate (IMR) is selected variable. Data of GSDP and total expenditure on education taken Ministry of education, GOI and total expenditure on health taken from Ministryof Health & Family Welfare. Data for Life expectancy and IMR is available from the handbook of statistics on Indian Economy (2020-21). The source of data collection for GER of students at senior secondary level is UDISE+ and for higher Education AISHE report from Education Ministry, GOI.

IV. DATA ANALYSIS and INTERPRETATION

Data on life expectancy at birth for men, women, and the whole population are shown in the graphs during five overlapping five-year periods, ranging from 2012–2016 to 2016–2020. Male and female life expectancy have been steadily increasing over these periods. In particular, female LE decreased from 68.5 to 66.7 in the similar time, while male LE went from 63.9 in 2012-2016 to 65.3 in 2016-2020. The average lifespan of the population increased gradually as well, from 64.3 to 66 Although the gender difference varies during these eras, it generally remains greater for women than for men, ranging from 4.6 years in the earliest to 1.4 years in the latest. These patterns point to continued advancements in health in Uttar Pradesh.

<Figure 1> and <Figure 2>

A generally positive trend in healthcare, nutrition, sanitation, and general living conditions that reduce infant mortality rates is indicated by the IMR data that have been steadily declining over time. There is an obvious declining trend in IMR from 2012 with an IMR of 53 to 2020 with an IMR of 38. Even as the IMR is decreasing by and large, there have been sometimes, like the year 2018 where it just slightly increases with respect to the previous one. In these instances, it is due to multiple factors or causes such as health-care regulation changes, health epidemics, and other changes in socioeconomics.

<Table 1>

From the academic years 2012–2013 to 2019–2020, the table presents information on the GER for males, females & the overall population across three levels of education: Secondary, Higher Secondary, and Higher Education. Enrollment in secondary education varies, with males often having a greater GER than girls. While the GER for girls varied widely, from 56.76% to 63.26%, the GER for males grew from 58.26% in 2012–2013 to 68.68% in 2019–2020. Similar trends may be seen in the overall GER, which increased slightly overall from 57.55% to 65.79%. More fluctuation may be seen in higher secondary education, with GER peaking in 2014–2015 and then typically dropping after that. In this category, the GER for men increased from 46.48% in 2012–2013 to 48.22% in 2019–2020, while the GER for women slightly increased from 45% to 45.39% during the same time frame. These changes are reflected in the overall GER, which increased slightly overall from 45.79% to 46.88% both genders' GERs are steadily rising, according to higher education, with female enrollment ratios constantly being greater than male enrollment ratios. While female GER increased from 20.4% to 26.9%, male GER increased from 18.8% in 2012–2013 to 23.7% in 2019–2020. In observation period, the overall GER in higher education likewise rose, rising from 19.5% to 25.3%.

<Table 2> and <Table 3>

The average of GSDP is 1116952.12 whereas the average of expenditure on education and health is 3928.59 and 14561.93 respectively. The above table shows the standard deviation of GSDP is 496793.41 whereas the standard deviation of expenditure on education and health is 7674.96 and 4178.89 respectively which indicates the divergence of data by the mean value. The table reports the Gross State Domestic Product (GSDP) and total government exp. on Health and Education, in absolute & percentage terms relative to GSDP for the years 2012–2013 through 2019–2020. GSDP grew steadily over this period, with the economy recording a consistent growth trajectory, from ₹768,930 crore in 2012–2013 to ₹1,710,496 crore in 2019–2020. Government spending on education is shown as both an absolute amount and as a % of the GSDP Between 2012–2013 & 2019–2020, the total expenditure on education had increased from ₹29,053.08 crore to ₹53,926.22 crore. On the contrary, the share of GSDP fluctuated, reaching the high of 20.27% in 2015–2016, declining to 3.15% in 2019–2020 and having started

at 3.78% in 2012–2013. In other words, 2015–2016's percentage was an anomaly. In absolute terms, health expenditure grew as well, from ₹8,798 crore in 2012–2013 to ₹20,250.2 crore in 2019–2020. Still, the share of GSDP allocated to health continued to be quite low, ranging between 1.00% and 1.27%. GSDP statistics for 2015–2016 indicate a remarkable surge of 7.79%, which could have been caused by the same anomaly with the exception of the outlier year of 2015–2016, these data show that while total spending on health and education has increased over time, the share of state resources devoted to these sectors has stayed mostly constant or even slightly declined. This would mean that the effect and effectiveness of public spending on health and education relative to economic growth have to be appraised.

<Table 4>

The correlation between GSDP and expenditure on education is 0.733269, which is of a moderately to strongly positive trend. Practically, in other words, the per cent of GSDP invested in education spending tends to increase with rising GSDP and vice versa. The correlation between GSDP and expenditure on health is 0.689486 indicates a moderate to strong positive correlation which depicts that when public spending on health is increases the GSDP is also increases and the coefficient of correlation between expenditure on health and expenditure on education is 0.926 which is verry high correlated.

V. CONCLUSION

Using empirical data for understanding the mechanism at work, this study proffers a comprehensive study of the connection between growth of the economy in Uttar Pradesh and its human capital. The finding reveals that human capitals, particularly health and edu. is necessary for the prosperity of the region. The importance of investing in these areas is underscored by the linkage between increased productivity and higher economic output and better health and educational outcomes. In our study the positive coefficient of correlation between the GSDP and expenditure on education and between the GSDP and public spending on health is found which depicts that when the expenditure on education and health is increases then GSDP is also increases in Uttar Pradesh. Long-term economic development in Uttar Pradesh appears to be contingent upon recurrent expenditures in health and education, based on the +ve correlation of HC with EG in the state. Policymakers should prioritize these initiatives for

equitable and sustainable growth, reduction of regional inequities, and general progress in the living standard of the people. Considering the fact that Uttar Pradesh has been traditionally low in literacy levels in comparison to the national average, education programs can greatly impact the state's economic performance. Education enhances individual productivity and contributes to creating a skilled labor force, which is required for growing the economy from agriculture-based to manufacturing and service sectors. There is a +ve link b/w development of economy & a better health indicator in the state of Uttar Pradesh; this includes longer life expectancies and accessibility to healthcare facilities. This represents the importance of health spending in regard to a good workforce, thus including an expanded health system, improved health of maternal and child well-being, and nutrition intervention. Individuals who enjoy better health are likely to contribute to higher productivity, engaged economic activities, and positive long-term economic development. Human capital investment has shown to be a factor strongly influencing the state's level of economic development in line with labor productivity, health, and education areas; this is according to empirical study on the link b/w HC & EG within Uttar Pradesh. According to this research, states such as Uttar Pradesh, which face problems of socioeconomic issues such as high population density, rural poverty, and low literacy rates, are likely to gain much from focused investment in human capital. The results indicate that there is requirement for the holistic approaches to HC development focusing on education, health, and skill building. For all Uttar Pradesh's human capital potential, the state government and more importantly the central and the local authorities could enforce most of the important policy measures and these could include Increasing the access and quality of educational opportunities. In the future years, Uttar Pradesh might indeed enjoy a better workforce were there a greater concentration towards high-quality basic and high school education. This will be in the form of reduced dropout rates, especially for girls, teacher preparation programs, and infrastructure improvement in rural schools. Investments in health, improving access to health care through preventive care programs, mobile clinics, and health programs will greatly improve health variables that directly affect economic growth. The need for skill development programs that are aligned with the sector's demands is crucial, especially given the youth population. This includes technical education, apprenticeships, and vocational training, especially in areas such as manufacturing, technology, and construction, which have much potential for growth. Strategic investment in education, healthcare, and workforce development is critical to unlocking the

state's economic potential and ensuring continued growth. To enhance its economic development, Uttar Pradesh needs to prioritize policies that treat human capital as a valuable long-term investment instead of a short-term expenditure. By cultivating a knowledgeable, healthy, and skilled workforce, Uttar Pradesh can progress towards a more thriving and inclusive economic future, which will not only benefit the state's growth but also contribute positively to India's overall growth.

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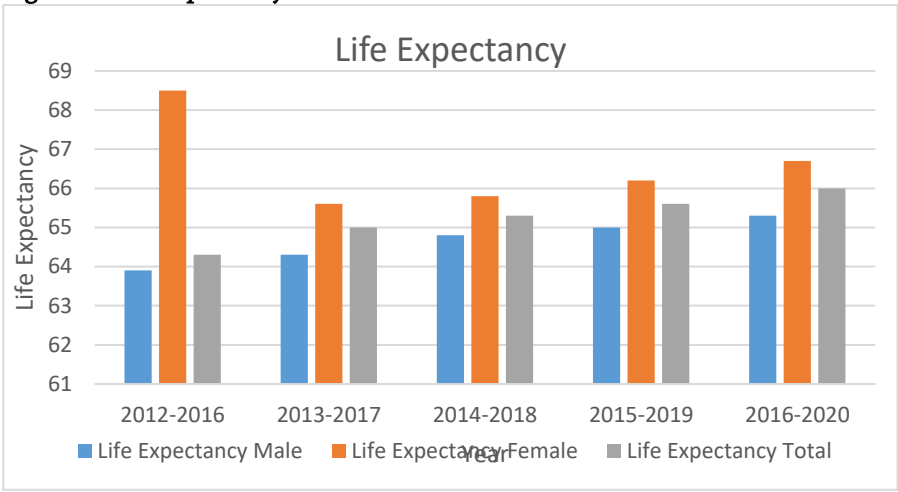
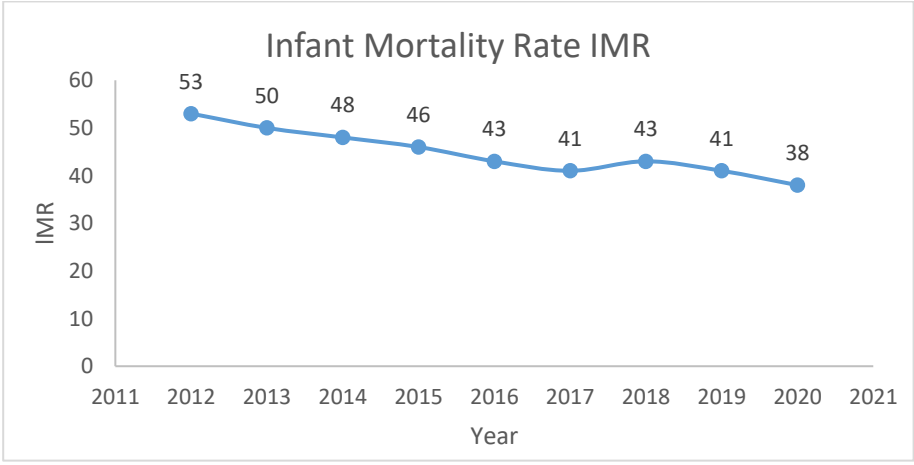
List of Figure

Figure: 1 Life Expectancy



Sources: Handbook of statistics on Indian States

Figure: 2 Infant Mortality Rate IMR



Sources: Handbook of statistics on Indian Economy

List of Tables:

Table 1; Gross Enrollment Ratio of Secondary, Higher Secondary and Higher Education in Uttar Pradesh

	Secondary Education			Higher Secondary Education			Higher Education		
Years	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
2012-2013	58.26	56.76	57.55	46.48	45	45.79	18.8	20.4	19.5
2013-2014	66.88	67.41	67.13	52.13	53.49	52.77	20.4	23	21.6
2014-2015	68.59	69	68.78	53.42	54.46	53.91	24.5	25.5	25
2015-2016	70.1	69.19	69.67	51.96	52.46	52.19	24.2	24.9	24.5
2016-2017	71.67	67.66	69.46	49.64	49.95	49.79	24.6	25.3	24.9
2017-2018	68.11	63.43	65.9	43.31	46.43	46.9	25.2	26.7	25.9
2018-2019	67.33	63.23	65.39	47.01	45.13	46.12	24.2	27.5	25.8
2019-2020	68.68	63.26	65.79	48.22	45.39	46.88	23.7	26.9	25.3

Source: Secondary level and higher secondary education from UDISE+ and for higher Education AISHE report from Education Ministry, GOI.

TABLE 2: Percentage of GDP on Health And Education

Year	GSDP	Total exp. on Edu.	%	Total exp. on health	%
2012-2013	768930	29053.08	3.78	8798	1.14
2013-2014	946508	32679.5	3.45	9488	1.00
2014-2015	1043371	36946.6	3.54	12209	1.17
2015-2016	177163	35916.29	20.27	13796	7.79
2016-2017	1290289	42031.08	3.26	16344.1	1.27
2017-2018	1416006	39411.82	2.78	17265.3	1.22
2018-2019	1582854	44312.15	2.80	18344.9	1.16
2019-2020	1710496	53926.22	3.15	20250.2	1.18

Source: GSDP and Total exp. on edu. taken Ministry of education, GOI and Total exp. on health taken from Ministry of Health & Family Welfare.

Table 3 Descriptive Statistics

statistics	GSDP	expenditure on education	Total exp. on health
Mean	1116952.12	39284.59	14561.93
Standard Error	175642.99	2713.51	1477.46
Median	1166830.17	38179.21	15070.05
Standard Deviation	496793.41	7674.96	4178.89

Sources: Authors own creation

Table 4 Correlation Analysis

	GSDP	Total Spending on Education	Total Spending on Health
GSDP	1		
Total Spending on Education	0.733268936	1	
Total Spending on health	0.689485789	0.926959224	1

Sources: Authors own creation

Authors Profile

Dr. Ranjit Singh, Associate professor, Department of Applied Economics, Faculty of commerce, University of Lucknow, the core research area is Marketing Management, Human resources Management and Rural Economics. There are 23 Research papers published (referred/Peer Reviewed) and 10 Books are written & published.

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