development stage and the productivity of educational investments.

First and foremost, investing in education entails investing in human resources, or developing a skilled labor force that will encourage innovation, raise wages and productivity, lessen the need for the state to fund various social programs, and increase the state budget through tax revenue accumulation. All of these outcomes are anticipated to have a positive effect on the nation's economic growth. The advantages of funding education don't stop here. Educating the population has numerous benefits for the state and society, including increasing the number of skilled workers, creating appropriate labor market profiles, increasing productivity and wages, and improving living standards. This leads to increased economic growth and social welfare. This research aims to assess how public education expenditures affect India's economic development. Education is often regarded as the primary driver of a country's economic growth. This study aims to examine the impact of public education spending on economic development in India.

II.LITERATURE REVIEW

Indira, M., & Kumar, I. (2018), The paper examines the link between higher education and economic growth in India, showing the important role that higher education plays in promoting a knowledge-based economy. It notes that India has created a strong higher education system, placing third globally after the USA and China, with constant growth in the number of educational institutions and participation rates in both public and private sectors. Despite this success, the share of public spending on education has stayed relatively low, regularly below 4% of GDP until a small increase in recent years, raising worries about the sufficiency of funds for human capital development. The study shows a positive link between greater spending on higher education and GDP growth, showing that higher investment in education is important for promoting economic development. Furthermore, the study shows differences in educational expenditure among different states, showing that wealthy states tend to give a smaller portion of their GDP to education compared to less affluent regions. Overall, the results underscore the demand for increased funding and policy support to leverage higher education as a driver for lasting economic growth in India.

Ansari, T. H., & Khan, M. A. (2018), this research paper examines public expenditure on education from 2001-02 to 2014-15, analyzing trends and intra-sectoral allocations at both central and state levels. Notably, while the state government's share has diminished, the central government's has risen, with overall public expenditure remaining below 5% of GDP; thus, it is recommended that both levels of government prioritize quality in education alongside budgetary considerations to foster human resource development.

Bhattacharyya, P. (2019), This research explores the causal link between government expenditures on education and economic development across 28 Indian states. Using panel data, cointegration tests, and the Panel Vector Error Correction model, the study analyzes short- and long-term relationships between these variables. The data demonstrate a long-run link, with unidirectional causation from economic development, measured by Gross State Domestic Product (GSDP), to public expenditure on education, indicating that as states expand economically, they drive increasing government spending on education. The research gives vital insights for policy design, especially in human resource development, and adds to the understanding of public expenditure's involvement in varied degrees of state development, making it relevant for academics and policymakers alike.

Ziberi, B. F., Rexha, D., Ibraimi, X., & Avdiaj, B. (2022), This research paper using an IV/2SLS regression model to adjust for biases and time-series data from 1997 to 2020 to examine the relationship between public expenditures on education and economic development in North Macedonia. The theory that education propels economic progress is supported by the data, which show a significant positive link between GDP growth and education spending. Wages, however, have a negative impact on productivity, suggesting a discrepancy between pay growth and real production. Despite increased investment on education, persistently high unemployment suggests that expectations from the job market are not being met by educational attainment. According to the study's findings, public investment on education stimulates economic growth, but specific changes are also required to raise educational standards and better match them with the demands of the labor market for sustainable development.

III.OBJECTIVES OF THE STUDY

The main focus of this paper is to demonstrate the causal relationship between higher education and economic growth in India, both in the short and long term. The specific objectives of this study are as follows:

1. To examine the trends of number of universities and colleges growth, Gross enrolment ratio, enrolment of male and female and public expenditure on education in India.
2. To analyse the impact of Public expenditure of education on Gross Domestic Product growth rate in India.

VI.METHODOLOGY OF THE STUDY

The study is based on secondary data collected from various annual reports by AISHE, MHRD, UGC, NSSO, Economic Survey of India, and others from 2000-01 to 2021-22. It uses correlation tests and regression analysis to examine the relationship between higher education and GDP. Growth in higher education is measured by public expenditure and enrollment, while economic growth is measured by

the annual GDP growth rate. CAGR and percentages are used for data analysis.

V.RESULT AND FINDINGS

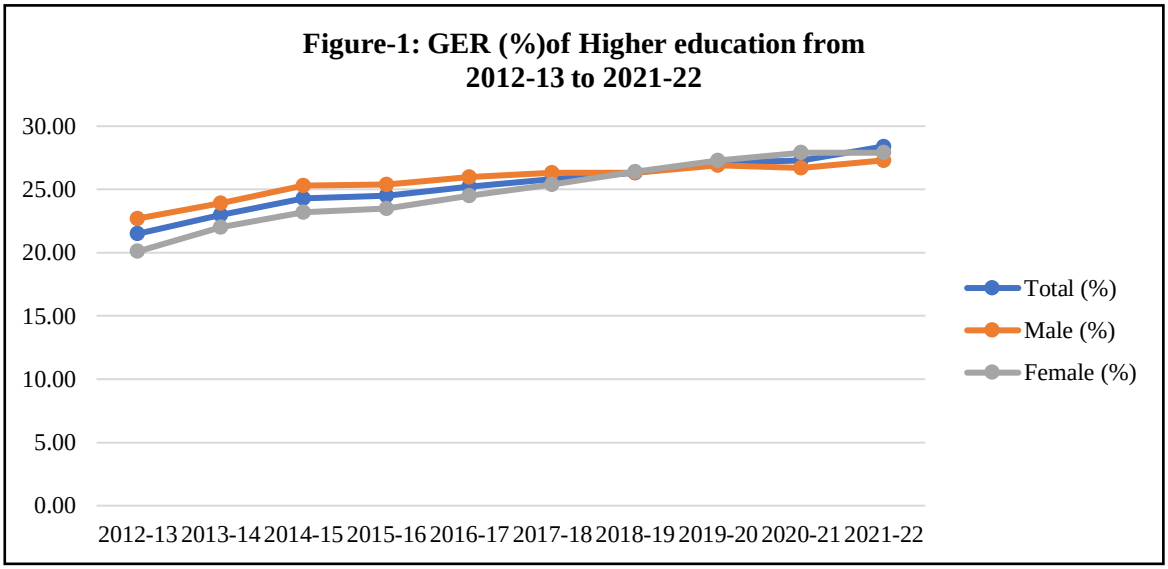
1. Gross Enrollment Ratio in Higher Education in India.

Gross Enrollment Ratio (GER) serves as a more comprehensive measure for evaluating the state of higher education. It indicates the total enrollment at a particular level of education, irrespective of age, expressed as a percentage of the corresponding eligible population for that level of education in a given academic year. Data regarding the GER for total, males and females is provided in table-1.

Table-1 Trends of Gross Enrollment in Higher Education in India (%) 2012-13 to 2021-22

Year	Total (%)	Male (%)	Female (%)
2012-13	21.50	22.70	20.1
2013-14	23.00	23.90	22
2014-15	24.30	25.30	23.2
2015-16	24.50	25.40	23.5
2016-17	25.20	26.00	24.5
2017-18	25.80	26.30	25.4
2018-19	26.30	26.30	26.4
2019-20	27.10	26.90	27.3
2020-21	27.30	26.70	27.9
2021-22	28.40	27.30	27.9
Average	**25.34**	**25.68**	**24.82**
CAGR (%)	**0.0282**	**0.0186**	**0.0333**

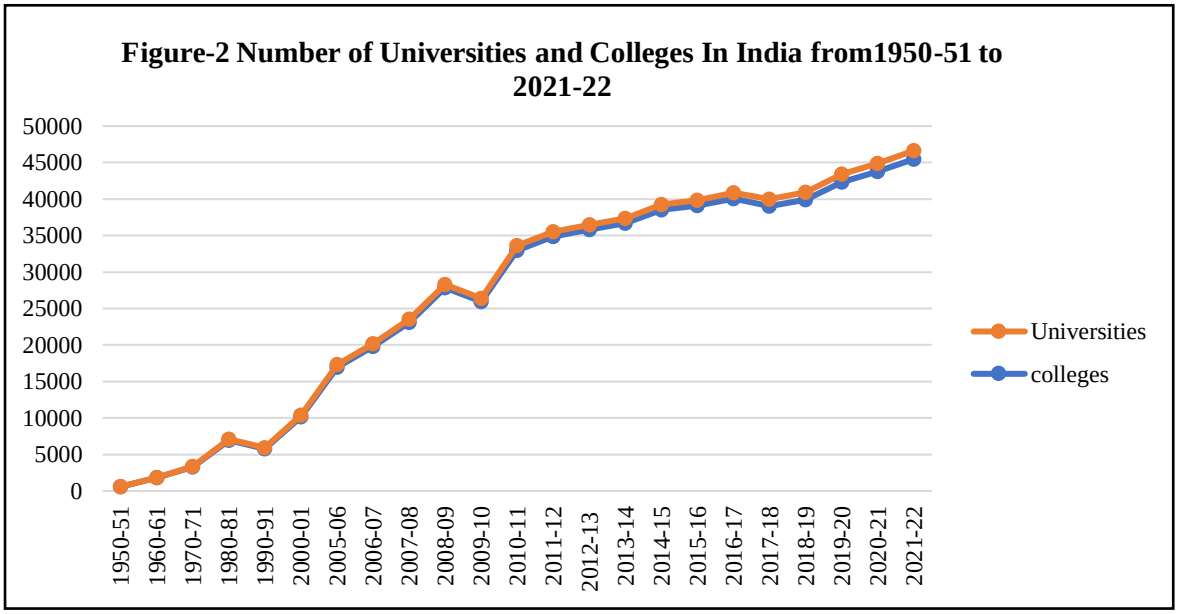
Source: Different AISHE reports



The data presented in table 1 and figure 1 illustrates the Gross Enrolment Ratio (GER) of India. It is evident from the data that the total GER has increased significantly over the past decade, from 21.5 percent in 2012-13 to 28.40 percent in 2021-22, indicating a modest improvement. The GER witnessed a substantial rise after 2010–11. Furthermore, there is a narrowing gender gap in GER for higher education. Female enrollment increased from 20.1 percent in 2012-13 to 23.2 percent in 2021-22, while male enrollment increased from 22.7 percent to 27.30 percent during the same period. Nevertheless, there are disparities in the enrollment of male and female students in higher education. Male student enrollment increased by approximately 5% over the last decade, whereas female enrollment increased by approximately 8%. The average growth rate for total GER was 25.34%, with males 25.68% and females 24.82%. Females had a lower average growth rate in GER than males.

2. Growth of Colleges and Universities in India

Table-2 Number of Universities and Colleges in India		
Year	**colleges**	**Universities**
1950-51	578	27
1960-61	1819	45
1970-71	3277	82
1980-81	6963	110
1990-91	5748	184
2000-01	10152	254
2005-06	16982	350
2006-07	19812	371
2007-08	23099	406
2008-09	27882	440
2009-10	25938	436
2010-11	32974	621
2011-12	34852	642
2012-13	35829	665
2013-14	36671	712
2014-15	38498	760
2015-16	39071	799
2016-17	40026	864
2017-18	39050	903
2018-19	39931	993
2019-20	42343	1043
2020-21	43796	1113
2021-22	45473	1168
CAGR	**6.25%**	**5.37%**
Source: Different AISHE reports		



The data presented in Table 2 and Figure 2 illustrates the growth of colleges and universities in India. According to the table, the number of colleges increased from 578 in 1950-51 to 45473 in 2021-22, which is approximately a 98.72% increase over the last seven decades. Meanwhile, the number of universities in India increased from 27 to 1168 over the same period which is approx. 97.62%. The compound annual growth rate (CAGR) for colleges in India over the last 72 years is 6.25%, while the CAGR for universities is 5.37%. The Trend of higher education institute is increase continues from last five decades.

3.PUBLIC EXPENDITURE ON EDUCATION AS GDP

The allocation of public funds for education is crucial for enhancing the accessibility and quality of higher

education. Table-3 illustrates the trend in public expenditure on education, providing valuable insights into the financial investments made in this sector over a specific period.

Table-3 Public expenditure on education as percentage of GDP from 2000-01 to 2022-23

Year	(STATES+ CENTRE) AS % OF GDP	Year	(STATES+ CENTRE) AS % OF GDP
2000-01	3.14	2012-13	3.01
2001-02	2.99	2013-14	2.97
2002-03	2.93	2014-15	2.9
2003-04	2.79	2015-16	2.81
2004-05	2.73	2016-17	2.78
2005-06	2.79	2017-18	2.68
2006-07	2.79	2018-19	2.61
2007-08	2.74	2019-20	2.98
2008-09	2.88	2020-21	1.13
2009-10	3.11	2021-22	2.7
2010-11	3.22	2022-23	2.9*
2011-12	3.09		

Source:
(i) GDP figures have been taken from Press Note Released on 02-08-2021 by National Accounts Division, CSO, MOSPI .
(ii) All India figures in column 3 is GDP have been taken from Press Note Released on 02-08-2021 by
MHRD Reports ***Estimated**

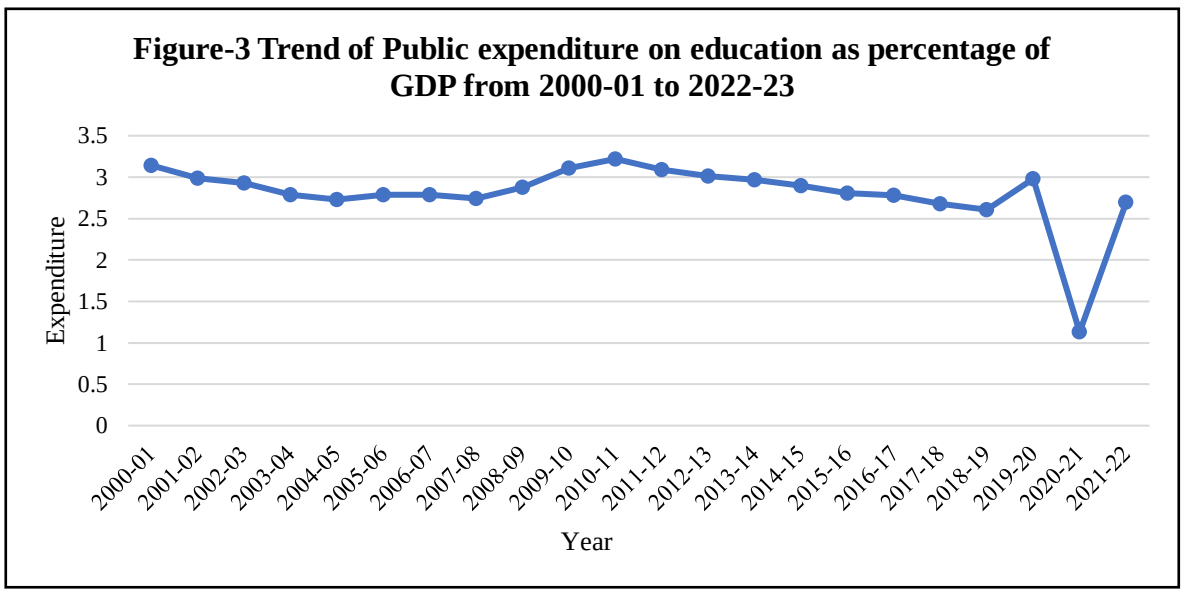


Table 3 and Figure 3 present data showing the percentage of public expenditure on education by the Central and State governments as a proportion of GDP. The data indicates that the share of public expenditure in GDP has not shown a significant increase over the past twenty years. It has consistently remained below 4 percent until 2021-22. In 2020, it was even below 2 percent due to the global pandemic, Covid-19. The share reached 3.22 percent in 2010-11 and 3.01 percent in 2012-13, but has not exceeded 3 percent since then. In 2022-23, the estimated expenditure on education was only 2.9 percent. This is concerning for the development of higher education and human development. Comparing with developed countries, it is observed that countries ranking high on HDI have allocated a larger percentage of their GDP to education. For example, countries like Norway, the Netherlands, Ireland, and Sweden have spent more than 5 percent of their GDP on education.

4. GROSS ENROLLMENT OF HIGHER EDUCATION AND GDP

The impact of higher education growth on GDP has been analysed using the correlation. It is based on the

hypothesis that increased educational growth contribute to the economic growth. While economic growth is indicated by GDP, growth in higher education is indicated by enrolment rate and expenditure on higher education. The results are presented below.

Table-4 GDP and Gross Enrolment in Higher Education in India 2012-13 to 2021-22		
Years	**GDP (%)**	**GER (%)**
2012-13	6.39	21.5
2013-14	7.41	23
2014-15	8.00	24.3
2015-16	8.26	24.5
2016-17	6.80	25.2
2017-18	6.45	25.8
2018-19	3.74	26.3
2019-20	-6.60	27.1
2020-21	8.68	27.3
2021-22	7.00	28.4
Source: World Bank and AISHE Reports.		

- **Correlation Between GER of Higher education and Annual GDP (%)**

Hypothesis

H_0: There is no correlation.

H_1: There is a positive or negative correlation.

Table-5 Correlations between GDP and GER			
		GDP	GER
GDP	Pearson Correlation	1	-0.291
	Sig. (2-tailed)		0.415
	N	10	10

In Table 5, the Pearson correlation test indicates a coefficient of -0.291, showing a negative correlation between the gross enrolment ratio (GER) and GDP. The calculated p-value of 0.415 exceeds the threshold of 0.05, leading us to reject the null hypothesis at a 5 percent level of significance. Therefore, we can infer that there is no correlation between GDP and GER. This suggests that the enrolment ratio in higher education does not affect the growth of the economy.

5. RELATISHIOP BETWEEN PUBLIC EXPENDITURE ON EDUCATION AND ECONOMIC GROWTH

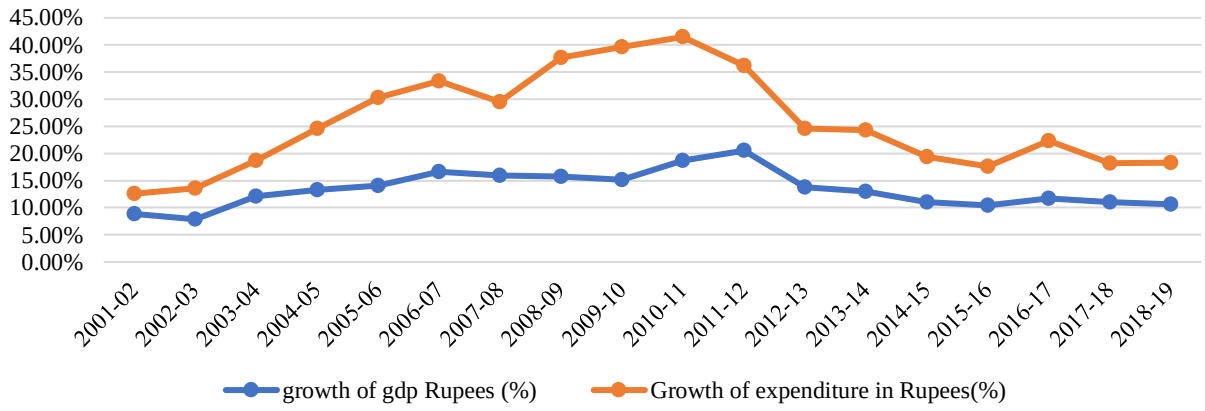
The relationship between public expenditure on education and economic growth has been analysed by using the correlation and regression test. It is based on the hypothesis that increased educational growth contribute to the economic growth. While economic growth is indicated by GDP, growth in education is indicated by public expenditure on education. The results are presented below.

Table-6 Public Expenditure on education as percentage of GDP				
Year	**GDP at current prices (at factor cost) Rs in crore**	**Growth in GDP amount annually in (%)**	**STATES+CENTER Expenditure**	**Growth of expenditure on education annually in (%)**
2000-01	1991982.00		62498.09	
2001-02	2167745.00	8.82%	64847.71	3.76%
2002-03	2338200.00	7.86%	68561.54	5.73%
2003-04	2622216.00	12.15%	73044.93	6.54%
2004-05	2971464.00	13.32%	81280.85	11.28%
2005-06	3390503.00	14.10%	94483.7	16.24%
2006-07	3953276.00	16.60%	110340.36	16.78%
2007-08	4582086.00	15.91%	125379.63	13.63%
2008-09	5303567.00	15.75%	152822.4	21.89%

2009-10	6108903.00	15.18%	190136.08	24.42%
2010-11	7248860.00	18.66%	233510.11	22.81%
2011-12	8736329.00	20.52%	270091.78	15.67%
2012-13	9944013.00	13.82%	299212.54	10.78%
2013-14	11233522.00	12.97%	333231.91	11.37%
2014-15	12467959.00	10.99%	361311.78	8.43%
2015-16	13771874.00	10.46%	387155.32	7.15%
2016-17	15391669.00	11.76%	428010.96	10.55%
2017-18(ACTUAL)	17090042.00	11.03%	458535.09	7.13%
2018-19(RE)	18899668.44	10.59%	493760.55	7.68%
2019-20(BE)	20351013.00	7.68%	606495.4	22.83%

(i) GDP figures have been taken from Press Note Released on 02-08-2021 by National Accounts Division, CSO, MOSPI .
(ii) All India figures in column 3 is GDP have been taken from Press Note Released on 02-08-2021 by

Figure-4 Growth of GDP and Public Expenditure on Education



The table 6 and figure 4 above represents the GDP current prices at factor cost and public expenditure (State and Centre) with growth percentages. The GDP growth was 8.82% in 2001-02 and decreased to 7.68% in 2019-20, with the highest GDP growth of approximately 20.52% in 2011-12. Public expenditure growth in higher education was 3.76% in 2001-02 and increased to 22.83% in 2019-20, while the highest growth in public expenditure for higher education was in 2009-10 at 24.42%.

➢ **Correlation Between GDP at current prices at factor cost and Public Expenditure on Education**

Hypothesis

H_0: There is no correlation.

H_1: There is a positive or negative correlation.

Table-7 Correlations between GDP and Public Expenditure on Education

		GDP AT PRICE	PUBLIC EXPENDITURE
GDP AT PRICE	Pearson Correlation	1	0.995
	Sig. (2-tailed)		0.000
	N	10	10

In Table 7, the Pearson correlation test reveals a coefficient of 0.995, indicating a highly positive correlation between GDP at current price at factor cost and Public Expenditure on Education. The calculated p-value of 0.995 exceeds the threshold of 0.05, leading us to not reject the null hypothesis at a 1 percent level of significance. Therefore, we can infer that there is a positive correlation between GDP and Public Expenditure on Education, suggesting a relationship between the growth of Gross domestic product and Public Expenditure on Education.

Regression Analysis

Using this technique, we identified the impact of public expenditure of Education on GDP. For that we consider the GDP as the dependent variable and public expenditure on education as independent variable.

So, the regression equation is: $y = \alpha + \beta xi + \epsilon$

Where Y= GDP at Price (%)

Xi = Public expenditure (%)

α and β are constat.

Table-8 Model Summary			
R	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
.549a	0.302	0.261	2.99753
The independent variable is Public expenditure (%)			

Table-9 ANOVA					
	Sum of Squares	**Df**	**Mean Square**	**F**	**Sig.**
Regression	66.060	1	66.060	7.352	.015
Residual	152.749	17	8.985		
Total	218.808	18			
The independent variable is public expenditure (%)					

Table-10 Coefficients					
	Unstandardized Coefficients		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		
GER	9.237	1.569		5.886	0.000
(Constant)	0.297	0.110	0.549	2.711	0.015

"Tables 8, 9, and 10 present the model summary, model significance, and coefficient of the model for the regression of growth GDP at price (%) on the growth of public expenditure on education (%) of India. From Table 8, we observed that only a 30.2% relationship exists between the growth GDP at price (%) on the growth public expenditure of education (%). Furthermore, in Table 10, the p-value of ANOVA is 0.015, indicating that the model is significant. Additionally, in Table 10, we noted that the coefficient of the model is also significant because the p-values (0.000 and 0.015) of the coefficient are less than 0.05. Therefore, we can conclude that the growth of GDP at price (%) on the growth public expenditure of higher education (%).

CONCLUSION

In order to promote equitable and sustainable development in any country, higher education is essential. Since it adds to human capital, which is necessary for the economy's social, economic, and technological development, it has a major effect on both short- and long-term economic growth. In the twenty-first century, it is an important instrument for developing a knowledge-based economy. India's higher education system has made significant strides in the last ten years. Today, the nation has a robust higher education sector with a sizable number of participating institutions and students. The number of establishments and total enrollment in higher education, including both public and private institutions, have consistently increased.

In the last decade, the examination of gross enrollment ratios indicates a 5% rise in male student enrollment and an estimated 8% increase in female student enrollment, implying a superior enrollment rate for female students relative to male students. The mean yearly gross enrollment ratio over the last decade is 25.34%.

The number of colleges and universities has significantly increased during the last 70 years. In particular, the data indicates a growth of almost 98.72% in the number of colleges and a 97.62% rise in the number of universities. This amounts to a compound annual growth rate (CAGR) of 6.25% for colleges and 5.37% for universities. This development pattern is a reflection of both the increasing access to higher education and the changing face of academic institutions throughout time.

Over the last two decades, public expenditure on Education as a proportion of GDP has declined. It only went up to 3.22 percent in 2010–11, but other than that, it stayed below 4 percent until 2022–2023. It was recorded as 2.9 percent in 2022–2023. Given that more financing for education is essential for growing human capital, this trend raises questions about the direction that higher education is taking.

Based on the data from table 6, we noticed that the GDP growth in 2019-20 decreased compared to 2001-02. However, the public expenditure on higher education increased during the same period. After conducting a correlation analysis, we found that the relationship between Gross Domestic Product (GDP) and Gross Enrolment Ratio (GER) is moderate, with a coefficient of -0.291. Based on the test results, we can conclude that there is no substantial or statistically significant relationship between education and economic growth.

We have concluded from our study that there is a positive association between the increase of public spending on education and the growth of GDP at current price at factor cost, based on correlation and

regression analyses. Additionally, our results show that the growth of GDP at present prices at factor cost is strongly influenced by the rise in public spending on education.

Our data also demonstrates a strong correlation between spending on higher education and GDP, showing that heightened investment in education leads to economic development by augmenting human capital. It is worth mentioning that we couldn't find a clear correlation between economic development and enrollment in higher education in India. Based on our thorough research, we suggest a rise in spending on education as a way to stimulate higher economic growth in India.

REFERENCES

1. *National Education policy (1986), Department of Human Resource development, Government of India, New Delhi.*
2. *Prof. (Dr.) Tania Gupta (2023), "An Analysis of The Relationship Between Education and Economic Growth", Journal of Survey in Fisheries Sciences 10(1S) 6279-6290.*
3. *Report on Analysis of Budget Expenditure on education 2008-09 to 2013-14, MHRD, Government of India, planning and Monitoring Unit, New Delhi, 2014.*
4. *Mohun P. Odit, University of Technology, Mauritius (2010), "The Impact of Education On Economic Growth: The Case Of Mauritius", International Business & Economics Research Journal – August 2010 Volume 9, Number 8.*
5. *Acharya, S., & Banerjee, A. (2016). The Impact of Education on Economic Growth: Evidence from India. Journal of Economic Studies, 43(1), 35-55.*
6. *Dholakia, R. H., & Langer, N. (2020). Education and Economic Growth: A Review of the Evidence with Special Reference to India. Indian Journal of Human Development, 14(1), 70-93.*
7. *AISHE reports of MHRD, Government of India, Annual Reports of MHRD, Government of India and Annual reports of UGC, Government of India*
8. *Indira, M., & Kumar, I. (2018). An Empirical Analysis of Relationship between Higher Education and Economic Growth in India. International Journal of Research and Innovation in Social Science (IJRISS), Volume II(VI), 90–97.*
9. *Ziberi, B. F., Rexha, D., Ibraimi, X., & Avdiaj, B. (2022). Empirical analysis of the impact of education on economic growth. Economies, 10(4), 89.https://doi.org/10.3390/economies10040089*
10. *Bhattacharyya, P. (2019). PUBLIC EXPENDITURE ON EDUCATION AND ECONOMIC GROWTH: A STATE-LEVEL ANALYSIS IN INDIA. Humanities & Social Sciences Reviews.*
11. *Ansari, T. H., & Khan, M. A. (2018). An analysis of public expenditure on education in India. World Wide Journal of Multidisciplinary Research and Development, 4(4), 89-92.*