Inter-State Disparities in Higher Education : Affecting Economic Development in India

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Abstract

The pivotal role of human resources is now universally recognized in economic growth. As modern education in India has been in vogue for more than two centuries, it may be surmised that the disparities in education might have been eliminated, by and large, during this long period. However, the fact remains that the differences of natural resource endowment, infrastructural regional inequalities, and paucity of financial resources led to the adoption of selectivity in regional development in India, which resulted in the disparities of social and economic development among the states. Research has been done to understand the intertemporal differential development of the states. This research paper is based on secondary data, supplemented by state wise data of population and gross state domestic product. The study used both econometric and statistical tools for the analysis of data. The methods and models used in the study ranged from simple tools of descriptive statistics like mean, median, variance, and coefficients of skewness and kurtosis. The data was also subjected to more rigorous two-factor ANOVA without replication to supplement the application of descriptive statistics. A very high degree of intertemporal and interspatial disparities was highlighted by these results. Socioeconomic inequalities emerged from the uneven distribution, and hence, a high degree of spatial concentration of population and population distribution among the Indian states was also examined.

Keywords : education, socio-economic inequalities, regional development, gross state domestic product

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Education was initially under the realm of religious institutions, and it focused on learning about the scriptures. Leaders of religious thought acted as teachers and preachers. The objective was probably to transform physical man into a spiritual man. Education was naturally associated with the learning of and about the scriptures. Subsequently, education encompassed learning and acquisition of skills related to arts and crafts, including martial arts. Ancient Indian education focused on the teaching and learning of all *'kalas and vidyas'* known to the then *gurus/rishis/munis*, who imparted education in their *ashrams* or *gurukuls*. Education was restructured to cope with the preparation of manpower on massive scales to satisfy the rising demand for manpower by factories. This also needed preparation of a large number of teachers away from ashrams, churches, guilds, and homes in use of cottage production. Basically, Western education was also introduced in India to prepare human resources for the British Administration in India. So, dissemination of knowledge, especially English language, geography and a few other subjects like mathematics was the basic purpose of learning and teaching. This brought in its chain a focus on economic aspects of education, including the role of education in economic growth. Economists like Vakil and Brahmanada (1953) and Schultz (1961) highlighted the contribution of education to economic growth. Their seminal contribution inspired researchers across the globe.

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Economists like Dennison (1966) empirically determined the contribution of education to economic growth, whereas Agarwal (2009) envisaged the future of Indian higher education by analyzing the current status. Anbalagan (2011) showed that there were interstate variations in public expenditure on education in India. If the expenditure on public goods such as health, education, and infrastructure is increased, it might be expected to have a positive effect on regional growth performance (Chikte, 2011). Education and employment are the key mechanisms through which disparity emerges (Prakasam, 2014). The disparities in earnings are due to differences in the level of education. Higher education has been found to be significantly related to the human development index, and the impact of higher education is greater for the disadvantaged groups (Joshi, 2006). The greater the level of higher education in a society, whether in stock or flow forms, the greater the level of human development can be, through the influence on two main components of human development index: life expectancy and GDP per capita (Tilak, 1994).

Correa and Tinbergen (1962) developed econometric and input-output models of education to include education as a visible of the system for pinpointing its contribution to growth. The Tinbergen-Correa model was applied to the data of several European countries such as Greece and Turkey. Panchamukhi (1965) developed linear programming model for India ; Prakash and Anand (2014) developed input-output models of education, which they fused into an econometric model of population growth and employment, and which revolved around economic growth.

Consequently, the pivotal role of human resources/human capital in economic growth is now universally recognized. Naturally, Indian five-year plans also assigned high priority to the development of education in independent India. Universal Elementary Education (UEE) remained the driving force of education policy of the Government of India, and the cherished goal of UEE was finally achieved in 2011. Now, Right to Education has legal sanctity. Higher education, however, grew more rapidly than school education in independent India. However, the pace of development of education has been uneven temporally as well as spatially, with the results that the regional inequalities of education and income have gone together hand in hand. This paper examines the regional aspects of growth of higher education in India and its dispersal across Indian states. This paper also evaluates the education-economy interface.

Research Methodology

The research is analytical in nature and is based upon secondary data. Data were collected from websites of Directorate of Economics and Statistics. Various other sources that were used for the same include the report and documents of Ministry of HRD. The data was collected in 2014. The analysis was done on the base year 2007-2008 and till data of 2011-2012.

All the data for this study was taken from the publications of the Government of India and regulatory authorities like UGC and AICTE. The data relates to number of colleges and universities and enrolments in the states at two points of time. Number of institutions and enrolments therein at two different points in time reflect the growth of education in the states. The data have been supplemented by state wise data of population and gross state domestic product (GSDP) at both these points of time. Population and GSDP furnish the backdrop for relating the growth of GSDP with the development of higher education both in absolute and relative terms. The Table 10 shows per capita net state domestic product at constant prices of 28 states and four Union Territories. Three Union Territories were excluded due to lack of data. They account for only 0.05% of Indian population, and thus, their impact is negligible. The Table 11 shows data of gross state domestic product constant prices. The Table 12 shows the data collected (see Appendix), which includes selected state-wise number of new government/private technical, professional, and management institutions approved by AICTE in India (from 2007-2008 to 2011-2012). All the data has been used for analysis by simple descriptive methods and more complex two-factor ANOVA. The research is cross sectional as well as longitudinal in nature.

Methods and Models

The study uses both econometric and statistical tools for the analysis of data. The methods and models used in the study range from simple tools of descriptive statistics like mean, median, variance, and coefficients of skewness and kurtosis. Results of application of these tools furnish the nature of distribution and the test of differences, if any, between appropriate statistics. Existence of disparities at any point in time may be attributed partly to early historical starts by some states and late starts by other states/regions. Late starts may prompt lagging states/regions to provide stimulus to more rapid growth than the growth that has already been achieved by early starters. But differential rates of growth are double edged instruments. If the leading states grow more rapidly than the laggards, then the existing disparities tend to be further accentuated. As against this, if the laggards grow more rapidly than the leading states/regions, disparities tend to shrink. But this involves long lags and leads in terms of time. The theory stipulates that in the early stages of growth, disparities tend to be accentuated, but as the economy and social systems approach a mature stage of growth, disparities tend to shrink. Statisticians/econometricians have evolved alternative tests for the evaluation of these tendencies. β - convergence is the necessary and σ - convergence is the sufficient condition for the tendency of disparities to shrink in the process of growth. Then, Lorenz curve and GINI coefficients are also widely used in research in regional analysis. Yule-Kendall (1950), however, mathematically established equivalence between GINI coefficient and Yule- Kendal coefficient (E) which is shown to equal to $E^2 = 2\sigma^2$. This also embodies σ - convergence. The study has used this also as a methodological tool.

The data were also subjected to more rigorous two-factor ANOVA without replication to supplement the application of descriptive statistics. A simple regression/econometric model has been used to assess the degree and direction of interrelation between development of higher education and growth of GSDP of states at the two points in time. The fact remains that differential development of the states has taken place between the base and terminal years to which the data relate.

Empirical Results and Analysis

Results of application of different methods and models have been examined sequentially.

Table 1. Descriptive Statistics of Number of Colleges

Parameters	Year 2007	Year 2012
Mean	42,749.58	1,19,667.9
Standard Error	11,728.91	24,515.23
Median	12211	71377
Mode	NA	NA
Standard Deviation	65,303.81	1,36,495
Sample Variance	4.26E+09	1.86E+10
Kurtosis	3.669367	3.70167
Skewness	2.047431	1.723
Range	2,43,148	5,96,884
Minimum	30	2178
Maximum	2,43,178	5,99,062
Sum	13,25,237	37,09,704
Count	31	31

Table 2. Results of Two Factor ANOVA on Distribution of Colleges

Source of Variation	*SS*	*df*	*MS*	*F*	*p - value*	*F crit*
Rows	6.88E+11	30	2.29E+10	5.924683	2.53E-06	1.840872
Columns	4.71E+10	1	4.71E+10	12.1564	0.00153	4.170877
Error	1.16E+11	30	3.87E+09	-	-	-
Total	8.52E+11	61	-	-	-	-

(1) Disparities in Number of Colleges : First, the results of applications of descriptive statistics are analyzed. Results of application of descriptive statistics to number of colleges are discussed, which are reported in the Table 1. The value of t - statistics of mean difference of these 2 years of observation is as low as 0.85, which suggests that the distribution of colleges among the Indian states has not changed much despite the lapse of a period of 5 years, and shows relatively moderate to high economic growth during the period of observation. But the t - statistics of mean difference of 2 years does not indicate the nature of distribution within the year itself. This inference needs more rigorous analysis, which is discussed as follows.

On the assumption that the values of the variables are symmetrically distributed, mean is expected to be equal to the median. The significant divergence between the values of mean and median may be taken to imply that the distribution is non-symmetrical. This postulation is evaluated by t-statistics. The difference between the mean and median number of colleges in the states is statistically significant; the value of t is 2.60 in 2007-08 and 1.97 in 2011-12. These values of t-statistics indicate that the colleges are not evenly distributed among the states. Departure from symmetry means that the distribution is skewed and the degree and direction of skewed nature of the distribution may be gauged from the coefficient of skewness. The formula used in Excel in this study stipulates the coefficient of skewness to lie between -3 and +3. These values are used for comparison. The values of the coefficients of skewness for 2007-08 and 2011-12 are 2.05 and 1.72, respectively; these values suggest that the distribution is positively moderately skewed, but the Yule-Kendall ($Y - K$) coefficient, E = 92.353.53 is extremely high. Incidentally, the $Y - K$ coefficient is mathematically equivalent to the Gini coefficient, which highlights the degree of concentration and inequality in the distribution of values of the variables.

Alternative tests of σ - convergence are used to examine the nature of distribution of colleges and the changes that have occurred during the 5 years that separate the two points of observations. The values of the coefficient of variation (CV) for 2007-08 and 2011-12 are 114.23% and 153.6%, respectively. It means that the degree of variation around the mean has increased over the years, which implies accentuation of disparities in the distribution / location of colleges in the states. This is despite the non-significant change in the value of mean. This implies that the additional colleges have tended to be concentrated in fewer states than before. The highly uneven distribution of colleges, an indicator of unequal spatial distribution of facilities, and hence, access to higher education across the Indian states, is further supported by as high a value of CV as 152.76%. It is obvious that there exists σ- divergence in the availability of higher education in India. σ - divergence, as against the β - convergence/divergence, is the sufficient condition for the existence of and/or increasing trend of socioeconomic inequalities.

The distribution is further evaluated by two factor ANOVA without replication. The results are reported in the Table 2. The Table 2 indicates that the variation between rows and columns is extremely high and statistically significant, since the calculated values of F are much greater than the table values for the given degrees of freedom. Between the rows, variation means that the number of colleges in 2 years, taken together, in various states has varied significantly from state to state. But the significant variation between the columns means that the number of colleges in all the states together in one year differs significantly from the variation of the other year. Thus, very high degree of inter-temporal and inter-spatial disparities is highlighted by these results. This also lends credence to $\sigma -$ divergence inferred earlier.

Table 3. Descriptive Statistics of Distribution of Population

Parameters	No. of Colleges	Population	Per Capita *Sdp*	*Sdp*
Mean	42,749.58	4,14,46,416	36,929.61	1,19,667.9
Standard Error	11,728.91	86,89,638	3,621.68	24,515.23
Median	12,211	2,77,56,989	31,725	71,377
Mode	NA	NA	NA	NA
Standard Deviation	65,303.81	4,83,81,854	20,164.66	1,36,495
Sample Variance	4.26E+09	2.34E+15	4.07E+08	1.86E+10
Kurtosis	3.669367	4.392675	1.416437	3.70167
Skewness	2.047431	1.808909	1.346341	1.723
Range	243148	2.16E+08	77,400	5,96,884
Minimum	30	4,89,640.3	9,685	2,178
Maximum	2,43,178	2.17E+08	87085	5,99,062
Sum	13,25,237	1.28E+09	11,44,818	37,09,704

Table 4. Results of Two Factor ANOVA on Disparities of Population Distribution

Source of Variation	*SS*	*df*	*MS*	*F*	*p - value*	*F crit*
Rows	1.48E+17	30	4.92E+15	1096.05	1.91E-38	1.840872
Columns	6.69E+13	1	6.69E+13	14.89445	0.000561	4.170877
Error	1.35E+14	30	4.49E+12	-	-	-
Total	1.48E+17	61	-	-	-	-

(2) Disparities in the Distribution of Population : As quite a few socioeconomic inequalities emerge from the uneven distribution, and hence, high degree of spatial concentration of population, population distribution among the Indian states has also been examined. It is well known that historically, human population settlements and their temporal shifts (migration/emigration) have been directly related to the means of living and physical conditions of survival. Generally, people have been migrating from less resource endowed regions to more and better resource endowed regions. Population size may, therefore, be used as an indicator of socioeconomic development of the regions as well as the disparities of development among the regions. The tests are also applied to spatial distribution of population in India. The results of application of descriptive statistics to population are reported in the Table 3.

The difference between mean and median population of the states both in 2007-08 and 2011-12 is not significant as is evident from the values of *t*-statistics, which are 1.58 and 1.52, respectively. It does not indicate significant inequality in the spatial distribution of population. The question is whether this inference can be supported by other evidence. The coefficient of variation has a high value of 116.73%, whereas $E = 6842274.1$, which is also quite high and does lend credence to the thesis of uneven distribution of population over space. The coefficient of skewness, being 1.81, also lends support to the thesis of moderately but positively skewed distribution of population among the states. However, the coefficient of variation (CV) is quite high; its values for 2007-08 and 2011-12 are 116.73% and 116.82%, respectively. The degree of disparities of population distribution among the states may probably be better captured by ANOVA. The results are reported in the Table 4.

The Table 4 reveals that variation is highly significant between rows. Calculated value of F is many times more than the corresponding table value. Population in both years taken together has significantly varied from one to another state. The variation of population in all the states taken together has also varied significantly between the years as is revealed by the significance of variation between the columns. The σ - divergence highlights the fact

Table 5. Descriptive Statistics of Absolute Value of Population

Parameters	Year 2007	Year 2012
Mean	4,02,13,561.87	4,35,23,634
Standard Error	8,5,03,550.309	91,32,067
Median	2,72,87,768.93	2,96,01,147
Mode	NA	NA
Standard Deviation	4,81,03,344.7	5,08,45,198
Sample Variance	2.31393E+15	2.59E+15
Kurtosis	4.507835024	4.919343
Skewness	1.840359993	1.884439
Range	21,61,24,813.5	2.31E+08
Minimum	4,89,640.3247	561182.5
Maximum	21,66,14,453.8	2.32E+08
Sum	1,28,68,33,980	1.35E+09
Count	32	31

Table 6. Results of Two Factor ANOVA without Replication (ANOVA SDP-2007/ 2012)

Source of Variation	*SDSS*	*df*	*MS*	*F*	*P - value*	*F crit*
Rows	1.5E+12	30	5.01E+10	50.32905	1.32E-18	1.840872
Columns	2.72E+10	1	2.72E+10	27.29508	1.24E-05	4.170877
Error	2.99E+10	30	9.96E+08	-	-	-
Total	1.56E+12	61	-	-	-	-

that the population disparities are highly marked between the states and disparities have been further accentuated by the lapse of 5 years between the years of observation. This inference is seemingly stronger than the inferences drawn from CV, mean, and median differences. If, however, absolute values of population are kept in view, then 16% variation is quite substantial.

(3) Size Normalization of Absolute Values : The features of distribution of colleges and population in Table 5 suggest that economic factors may lie behind this uneven distribution of population and colleges. This speculation is examined by the analysis of GSDP and per capita GSDP of states. Value of *t*-statistics of the difference of mean and median GSDP is 1.97 in 2007-08, which is statistically significant at the 0.05 probability level. The value of CV = 114.1% is also high, so it cannot be taken to imply even distribution of GSDP. *Y*- *K* coefficient, *E*=193033.1 is quite high, which also suggests certain degree of spatial concentration.

The results of two factor ANOVA without replication are reported in the Table 6. The results do not lend credence to the inference that there exists moderate or non-significant disparities of GSDP among the states. Both between rows and columns, variation of GSDP is highly significant statistically. This highlights the σ - divergence in the distribution of GSDP among the Indian states. Therefore, it may safely be inferred that the developmental inequalities are quite high among the states of India and the disparities have been accentuated over the years. These disparities of GSDP are expected to be associated with the disparities of educational development in states.

(4) Distribution of Population Scale - Free GSDP in States : As population or area may have size/scale effect on the distribution of GSDP, per capita GSDP is considered. The *t* - value of the difference between mean per capita GSDP of all states and median value of per capita GSDP is 1.44, which is not statistically significant at the 0.05

Table 7. ANOVA Results of Distribution of Population Scale Free GSDP in States (Per capita SDP 2007-12)

Source of Variation	*SS*	*df*	*MS*	*F*	*P - value*	*F crit*
Rows	3.21E+10	30	1.07E+09	42.03317	1.77E-17	1.840872
Columns	1.73E+09	1	1.73E+09	67.8674	3.39E-09	4.170877
Error	7.64E+08	30	25456225	-	-	-
Total	3.46E+10	61	-	-	-	-

Table 8. Descriptive Statistics of Population

Parameters	**College / Population**	
	2007-08	**2011-12**
Mean	0.000991	0.244396
Standard Error	0.000167	0.035901
Median	0.000712	0.1844
Mode	NA	NA
Standard Deviation	0.000932	0.196638
Sample Variance	8.69E-07	0.038666
Kurtosis	1.425526	0.698628
Skewness	1.300925	1.031335
Range	0.003583	0.787902
Minimum	2.56E-05	0.008993
Maximum	0.003609	0.796895
Sum	0.030709	7.331891
Count	31	30

probability level. The value of CV = 54.6% is also moderate as compared to that of GSDP or population, which does not suggest σ- convergence. The value of E = 28517.14 is quite high. The spatial distribution of GSDP and per capita GSDP does support the thesis that the uneven distribution of colleges might be due to economic factors per se. As has already been noticed that the *t*-statistics of mean and median difference or mean differences and even CV may conceal more than what they reveal, the results of ANOVA are given in the Table 7.

As expected, both between rows and columns, the variations are highly significant statistically. These results lend strong support to the inferences based upon the evaluation of descriptive statistics that suggest σ -divergence. Like GSDP, GSDP per capita has also displayed a high degree of σ-divergence in the spatial and temporal distribution of per capita GSDP. Therefore, it may be inferred that the results based upon the analysis of GSDP are not due to the scale effect.

(5) Scale/Size Free Distribution of Colleges in States : Naturally, the question is whether the number of colleges in states is related to population/GSDP. This is examined by eliminating the scale effect by normalization of both colleges and GSDP by population. So, the number of colleges per lakh population and SDP per capita are taken into consideration. The Table 8 of descriptive statistics contains the basic features of spatial distribution in 2007-08 and 2011-12.

The evidence furnished by some descriptive statistics and the derivatives of descriptive statistics of the number of colleges per lakh population do not lend strong credence to the thesis of spatial concentration of colleges either on per capita or on per unit of SDP basis. The values of *t* of differences of mean and median of colleges per lakh

Table 9. Two Factor ANOVA of Population/ GSDP (Colleges/Population, 2011-12)

Source of Variation	*SS*	*df*	*MS*	*F*	*P - value*	*F crit*
Rows	0.000117	30	3.9E-06	6.454406	9.76E-07	1.840872
Columns	1.41E-05	1	1.41E-05	23.37109	3.72E-05	4.170877
Error	1.81E-05	30	6.04E-07	-	-	-
Total	0.000149	61	-	-	-	-

population and colleges per unit GSDP equal 1.68 and 1.68, respectively, which does not indicate the difference to be statistically significant at the 0.05 probability level. Hence, the distribution seems to be symmetrical, but symmetry does not necessarily mean the distribution to be totally free from concentration or disparity. The values of CV for 2007-08 and 2011-12 are 94.05% and 80.47%, and these lend some support to the above inference. Values of $E = 0.00132$ and 0.2781, and the coefficient of skewness = 1.3 and 1.03 for two variables lend credence to the evidence furnished by t-statistics and CV. On the whole, it may be inferred that the number of colleges, an indicator of provision of access to higher education in the states in 2007-08, when normalized by population or GSDP, does not show a high degree of disparity.

For an inter-temporal comparison of the same variables as above, the results of application of descriptive statistics for 2011-12 are also analyzed. The results are reported in the Table 9. The value of t of difference of the mean and median number of colleges is 2.60, which is statistically significant at the 0.05 probability level. This result is not the same as for 2007-08. This suggests that so far as the distribution of the number of colleges in Indian states is concerned, the degree of disparities appears to have remained the same despite a lapse of 5 years, economic growth, and social development. Let us test the hypothesis that the degree of disparities has been accentuated. For this, the test of difference between the mean of the number of colleges in these two time periods is applied. As mean and variance capture the basic features of sample distribution, mean convergence may be used to supplement the σ -convergence.

The above inferences are more rigorously evaluated by two factor ANOVA, and the results of the same are reported in the Table 9. The results are not in consonance with the inferences drawn from the results of descriptive statistics. The Table 9 reveals that the variation of colleges per lakh population is highly significant between rows and columns. It means that σ-divergence of disparities of a number of colleges both between the years and between the states. It is expected that similar results hold true for number of colleges per unit of GSDP. The hunch is supported by the results of ANOVA as reported in the following section.

(6) Inter-Relation Between Number of Colleges and Population

$$Y_{11} = 9769.85 + 0.0008X_{11}, R_2 = 0.347543, F = 15.45 > F^* = 0.0005 \qquad (1)$$
t: (0.76) (3.93)

$$Y_{12} = \text{-}2489.69 + 0.3780X_{12}, R_2 = 0.6244, \ F^* = 1.25E\text{-}07 \qquad (2)$$
t: (-0.25) (6.93)

$$Y_{13} = 0.00017 + 2.23\text{E-}08X_{13}, R_2 = 0.2319, F = 8.75 > F^* = 0.006 \qquad (3)$$
t: (0.53) (2.96)

$$Y_{21} = 16027.47 + 0.0019X_{21}, R_2 = 0.4052, F = 19.76 > F^* = 0.0001 \qquad (4)$$
t : (0.57) (4.44)

$$Y_{22} = \text{-}10926.5 + 0.6734X_{22}, R_2 = 0.6534, \text{F} = 54.67 > F^* = 3.8E\text{ - }08 \qquad (5)$$
$$t: \ (\text{-}0.50) \quad (7.39)$$

$$Y_{23} = 0.0008 + 2.34\,E\text{ - }08^{**}\,X_{23}, R_2 = 0.104, F = 3.37 > F^* = 0.077 \qquad (6)$$
$$t: \ (1.21) \quad (1.84)$$

** Significant at the 0.07 probability level.

Y_t denotes number of colleges and X_i stands for pre-determined variables, first subscripts 1 and 2, attached to Y and X, refer to the year 2007-08 and 2011-12, respectively. Second subscripts of Y, which are 1, 2, and 3 relate to absolute number of colleges, number of colleges relative to population, and GSDP, respectively. Second subscripts, 1, 2, and 3 of X stand for the years 2008 and 2012. First subscripts 1 and 2 of X refer to absolute population and year, respectively, while subscript 3 stands for GSDP relative to population.

The results of the paper go in consonance with the results obtained by Levine and Renelt (1992), who emphasized that four variables robust for regional disparities are: the initial level of per capita income, population growth, the rate of investment to GDP, and secondary school enrollment rate. It is this structure of regional economics which is likely to be a major determinant of growth performance. There are huge differences in living standards, measured by per capita incomes across states of India (Thirlwall, 2013). The results of the research paper support the results obtained by Thirlwall (2013). There are also other related disparities in levels of education, literacy, health, infrastructure, population growth, investment expenditure, and structure of regions. Regional differences can have serious implications for economic and political functioning of national economics.

Conclusion

The simple bi-variate model fits all three sets of data well and the explained proportion of variation ranges from 10.4% for relation 6 to 65.34% for relation 5. However, the coefficient of determination and the slope coefficients are statistically significant in all six cases. Therefore, both the minimum and maximum values explained by the coefficient of determination relate to the year 2011-12. Besides, both relation 5 and 6 pertain to relative measures of dependent and pre-determined variables. Incidentally, relations 2 and 5 emerge as the most satisfactory for 2007-08 and 2011-12. The dependent variable in both these functions is the number of colleges per lakh population and per capita GSDP as the independent variable.

A number of roles of education in society and economy were analyzed by Harbison and Myer (1964). Marshall distinguished between 13 different facets and economic aspects of education which were analytically evaluated by Prakash and Anand (2014), who also differentiated between seven different economic roles of education. The study revealed that there existed a wide interstate disparity in terms of public expenditure on higher and technical education, most of the states, which were spending very less on higher education witnessed lower college population index. Less government spending has resulted into lesser availability quality choice and poor academic infrastructure in states (Anand, 2014). As the world looks east for global leadership in economic growth, India has to consistently pay attention to higher education as a source of growth in current times of knowledge driven growth (Joshi & Ahir, 2013).

Research Implications

Neutralization of the number of colleges and GSDP for size effect of population furnishes the best results. Research implies that the number of colleges is not in consonance with the size of population. Demand and supply has always remained the core factor which leads to variations in educational facilities in various states. The location of colleges should be in proportion to the number of students, that is, where there is a larger cluster of students, there the colleges should be relatively more as compared to locations with significantly smaller student clusters as the number of colleges and population are directly related to GSDP.

Policy Implications

- There is an urgent need for policy interventions to remove inter and intra-regional inequalities of development of technical and professional education among various states and union territories in India.
- Higher education in general and technical & professional education in particular need greater priority in terms of investment and policy designing. Access to technical and professional education need accelerating growth in states which are lacking in education facilities and its subsequent maintenance.
- Government should make policies which try to ensure that location of colleges should be decided on the basis of population density and available educational facility.
- Rules, regulations, policies, and procedure should be strictly implemented and adherence must be ensured.
- On analyzing the high private returns to higher education, there can be scope for government to shift some cost of acquiring Higher Education to individuals.

Limitations of the Study and Scope for Further Research

The study is based entirely on secondary data. Primary data could not be collected. Data was available only until 2012 on Internet sites. Recent data was not available or uploaded on various educational sites. Per-capita data at constant price of few states and union territories was not given, which affected the study. We have not been able to access recent data as university sites were not updated after 2011; expenditure data was only available till 2011-12. This offers scope for further research. This study has been done for a number of professional colleges state wise using secondary data. The study can be extended to all degree colleges of various states, which will figure out the real education scenario.

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Appendix

Table 10. Per Capita Net State Domestic Product at Constant Prices as on 01-03-2012

States/UTs	Per Capita at Constant Prices				
	2007-08	2008-09	2009-10	2010-11	2011-12
Andhra Pradesh	33,239	35,272	37,061	40,366	42,710
Arunachal Pradesh	30,187	31,971	35,278	37,417	38,130
Assam	18,089	18,922	20,193	21,406	22,956
Bihar	9,685	10,994	12,012	13,632	15,268
Jharkhand	20,996	19,867	20,646	21,734	22,902
Goa	87,085	90,386	96,885	1,02,844	1,12,372
Gujarat	42,498	43,685	48,511	5,27,08	NA
Haryana	47,054	49,806	54,884	5,92,21	63,045
Himachal Pradesh	40,143	41,666	43,305	47,106	49,817
Jammu & Kashmir	24,470	25,641	26,344	27,607	28,932
Karnataka	35,574	37,687	38,646	39,301	41,545
Kerala	40,288	42,433	45,908	49,873	53,427
Madhya Pradesh	17,572	19,442	21,095	22,382	NA
Chhattisgarh	22,929	23,926	24,690	27,156	29,635
Maharashtra	50,532	51,053	57,458	62,729	NA
Manipur	20,106	21,169	22,359	23,298	24,327
Meghalaya	27,764	30,963	33,235	35,932	38,944
Mizoram	28,467	31,933	34,456	36,732	NA
Nagaland	37,317	39,041	40,057	40,957	41,522
Orissa	21,640	22,963	24,275	25,708	26,900
Punjab	39,567	41,003	42,727	44,752	46,688
Rajasthan	21,922	23,356	24,166	26,436	NA
Sikkim	31,725	35,398	44,186	47,655	NA
Tamil	41,314	42,939	46,692	51,928	56,461
Tripura	29,022	31,711	34,328	37,216	40,411
Uttar Pradesh	14,875	15,713	16,374	17,349	18,103
Uttrakhand	35,437	38,625	42,292	44,723	47,831
West Bengal	27,094	27,914	30,372	32,228	34,229
Andaman &Nicobar	50,629	56,304	56,136	54,765	53,512
Chandigarh	86,923	88,284	91,598	99,487	NA
Delhi	83,243	91,845	1,00,050	1,08,876	1,19,032
Pondicherry	64,749	69,760	747,20	79,333	81,469
All India per capita	**30,332**	**31,754**	**3,38,43**	**35,993**	**38,005**

Source: Directorate of Economics and Statistics 2012

Table 11. Gross State Domestic Product at Constant Prices as on 01-03-2012

States/UTs	GSDP at Constant Prices				
	2007-08	**2008-09**	**2009-10**	**2010-11**	**2011-12**
Andhra Pradesh	3,06,645	3,27,731	3,47,344	3,81,942	40,7949
Arunachal Pradesh	4,227	4,596	5,276	5,691	5,899
Assam	60,568	64,033	69,143	74,215	80,465
Bihar	99,492	1,13,994	1,25,875	1,44,472	1,63,439
Jharkhand	71,377	70,129	73,618	78,045	83,170
Goa	15,875	17,462	19,318	20,922	23,151
Gujarat	2,81,273	3,00,341	3,30,671	3,65,295	NA
Haryana	1,26,192	1,36,540	1,51,563	1,66,095	1,79,589
Himachal Pradesh	30,917	33,210	35,907	39,066	42,032
Jammu & Kashmir	32,561	34,664	36,329	38,739	41,367
Karnataka	2,28,202	2,44,421	2,57,125	2,79,932	2,97,964
Kerala	1,54,093	1,62,659	1,77,209	1,93,383	2,08,468
Madhya Pradesh	1,35,986	1,52,802	1,68,851	1,82,647	NA
Chhattisgarh	63,644	68,982	71,221	79,166	87,723
Maharashtra	5,99,062	6,19,291	7,01,550	7,75,020	NA
Manipur	5,900	6,287	6,767	7,184	7,632
Meghalaya	7,970	9,001	9,814	10,736	11,760
Mizoram	3,336	3,781	4,174	4,557	NA
Nagaland	7,445	7,917	8,262	8,591	8,929
Orissa	1,02,846	1,10,812	1,18,201	1,28,367	1,37,585
Punjab	1,23,223	1,30,431	1,39,059	1,48,844	1,57,455
Rajasthan	1,60,017	1,74,556	1,84,189	2,04,398	NA
Sikkim	2,178	2,535	3,343	3,642	NA
Tamil	3,05,157	3,20,085	3,50,258	3,91,372	4,28,109
Tripura	10,988	12,025	13,061	14,203	15,463
Uttar Pradesh	3,22,214	3,44,726	3,65,761	3,94,499	4,19,090
Uttrakhand	38,015	42,837	47,599	51,107	55,606
West Bengal	2,57,632	2,70,248	2,96,843	3,17,786	3,40,234
Andaman &Nicobar	2,479	2,834	2,964	2,982	3,003
Chandigarh	11,581	12,519	13,727	15,754	NA
Delhi	1,37,961	1,55,791	1,72,830	1,91,696	2,13,429
Pondicherry	8,093	8,794	9,551	10,318	11,448
All India Per Capita	**38,96,636**	**41,58,676**	**45,07,637**	**48,85,954**	**52,22,027**

Source: Directorate of Economics and Statistics 2012

Table 12. Number of Professional Colleges State Wise (2007-08 to 2011-12)

States/UTs	2007-08	2008-09	2009-10	2010-11	2011-12
Chhattisgarh	12,527	20,300	25,826	34,239	35,060
Gujarat	47,100	63,862	94,503	1,18,954	1,28,230
Madhya Pradesh	74,412	95,601	1,22,623	1,49,782	1,54,642
Andaman & Nicobar	120	120	300	300	300
Arunachal Pradesh	661	671	701	656	686
Assam	3,268	3,763	5,486	6,858	6,704
Jharkhand	6,652	8,107	9,037	11,597	13,149
Manipur	115	115	145	265	285
Meghalaya	410	410	650	770	830
Mizoram	30	30	30	30	30
Odisha	38,347	51,230	73,448	91,174	90,804
Sikkim	917	927	1,002	1,138	1,216
Tripura	350	350	350	440	440
West Bengal	34,409	40,795	49,395	59,194	63,864
Chhattisgarh	2,184	2,430	2,557	2,664	2,664
Delhi	18,463	21,193	22,961	25,530	24,667
Haryana	51,869	94,081	1,10,822	1,37,694	1,48,103
Himachal Pradesh	3,752	5,906	11,622	17,582	18,216
Jammu and Kashmir	5,868	6,193	6,653	7,561	7,079
Punjab	50,023	70,355	94,204	1,18,827	1,24,080
Rajasthan	38,853	52,208	69,447	1,27,448	1,29,428
Bihar	5,651	8,134	9,164	12,443	11,332
Dadra and Nagar Haveli	390	450	450	510	528
Uttar Pradesh	95,476	1,37,167	1,90,779	2,71,514	2,88,862
Uttrakhand	12,211	15,974	22,198	30,680	33,406
Andhra Pradesh	2,28,728	3,26,959	4,42,568	5,56,373	6,05,993
Karnataka	1,34,206	1,53,999	1,85,449	2,13,625	19,8172
Kerala	48,020	50,890	60,289	73,370	80,504
Pondicherry	4,511	5,327	6,667	8,507	9,449
Tamil Nadu	2,43,178	3,00,454	3,72,725	4,36,509	4,65,754
Daman and Diu	120	120	120	360	360
Goa	2,367	2,388	2,412	2,608	2,944
Maharashtra	1,60,559	2,09,510	2,64,705	3,54,914	3,86,969

Source: India.stat.com 2012