Analysis of Inter-state School Education Development in India

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Abstract: Education is the foremost and vital of all the other factors contributing to developing an economy. It provides qualitative and quantitative labor for the further production and development process in the country. The present study scrutinized the development of education in the states of India in 2016-17 and delineated the categories for the state according to their educational development. The study used secondary data compiled by the DISE 2016-17. The Education Development Index (EDI) has been built by applying Factor Analysis on 22 indicators and categorizing the States Inter Quartile Range formula has been used. The study results delineate that states are more developed at Senior Secondary education level than other levels and in case of composite index states such as Puducherry, Delhi, Tamil Nadu, and Mizoram Punjab are highly developed. At the same time, Sikkim, Bihar, Andaman & Nicobar, and Arunachal Pradesh are the states having the lowest EDI. Thus to overcome such differences, proper plans should be made, and there should be an immediate implementation of those plans.

Keywords: Inter-State, Education Development, Composite Index, Categories.

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1. Introduction

Education is the foremost and important of all the other factors that contribute to the development of the economy. It provides qualitative and quantitative labor for the further production and development process in the country. Education helps an individual develop intellect, critical thinking abilities, experience, skill, and sound attitude. It is a way of developing an individual's decision-making ability and new advancement in the area of technology, business, economics, peace, social justice, and human rights. According to Nelson Mandela, "Education is the most powerful weapon, which you can use to change the world."

In the Indian constitution, every child up to the age of 14 years has the right to free and compulsory education. After independence Government of India has been framed and implemented various policies & programs to initiate & develop the education system in the country. For smooth regulation and expansion of the education system, the Government has effectuated the Kothari Committee's suggestions as "National Policy on Education" in 1968, which mainly focus on universal primary education. Then with new recommendations, the Government of India announced the new policy on education known as "New National Policy on Education" in 1986, which focuses on universal primary education as well as vocationalization and specialization of secondary and higher education in the country. After few years, NCERT (National Council for Educational Research and Training) at the national level and SCERT (State Council for Educational Research and Training) have been established to maintain the standard of education in the country. Till now, various education schemes and policies such as Mid-day Meal, Mahila Samkhaya schemes for elementary level of education, Rashtriya Madhyamik Shiksha Abhiyaan Schemes of Vocational Education and National Scholarship etc., for secondary level of education has been implemented by the Government, which has a positive impact and has increased the quality of education.

2. Present status of education in India

As India is the rapidly developing nation in the world and the second highly populated country after China, it is also has a qualitative educational system. Since independence, there was significant growth in the education level in the country, a huge number of schools from primary to higher education have been opened, and there was an increase in the number of enrolment, infrastructure facilities, and availability of other resources that are needed for quality education every year in these institutions. But apart from the huge development in the education system, some states of the country lag behind, and some states developed in terms of education than other states.

According to the fourth annual report of Annual Status of Education Report (ASER) states, the enrollment rate was 96 percent, and it was maintained to 95 percent for students of 6- 14 years from 2007 to 2014. The number of students who are not enrolled in this age group decreased to 2.8 percent in 2018. In India, 80 percent of recognized schools are government schools. In January 2019, Kerala was the state which becomes the first in

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achieving 100 percent primary education. According to ASER 2018, the status of primary school in terms of infrastructure is that 66.4 percent of schools have usable girl's toilet and 64.4 percent of schools have campus boundary wall in 2018. The report states that 90 percent of schools in Himachal Pradesh, Haryana, and Maharashtra had a playground facility.

In the context of secondary education, the District Information System for Education, flash statistics shows that there is a total of 252176 schools in 2015-16 out of which there were 6.27 percent of girl's school and 91.46 percent of co-education school at secondary level and 7.43 girls school and 89.33 co-educational schools at senior secondary education level in the country. In terms of infrastructure facilities, there is 84.11 percent of schools at both secondary and senior secondary education level having boundary walls in 2015-16. Mizoram, Tripura, Sikkim, and Bihar are the states which lack the facility of having campus boundary walls in schools. According to flash statistics (2015-16) 97.9 percent of schools have boy's toilet facility and 98.4 percent of school have girls' toilet in the schools. Most Indian states and union territories have achieved 100 percent in both boy's and girls' toilet facilities in the schools.

In the present paper, we analyzed education development among the Indian states along with Union territories in the year 2016-17.

3. Literature Review

The variations in the status of elementary education in Jharkhand and its comparison from the neighboring states has been estimated in [4] with the use of secondary data collected from the census of India 2001, census of India 2011, economic survey 2017-18, NSSO 71st round survey, 2014, etc. The gender parity index was calculated for estimating the gender gap. The study concluded that Jharkhand had achieved a significant improvement in many indicators in terms of elementary education compared to neighbor states and national level.

The review of secondary education in Odisha has been studied in [1], which has used secondary data from Odisha Primary Education Program Authority and Directorate of Economics and Statistics, Govt. of Odisha. The study revealed that tribal-dominated regions have a high rate of dropouts as compared to other regions. There is a lack of facilities in the school, such as drinking water, toilets and electricity, and a lack of teachers.

The inter district infrastructural development level has been computed for 1994-95, and 2011-12 was measured in [9] through the composite index as an equal-weighted index method. Secondary data has been used and compiled from government and non – government institutions. Economic Survey of Odisha, District Statistical Handbook, etc. 13 indicators of physical infrastructure facilities have been taken for the state. The study revealed an increment in the less developed districts in the state, and the number of developed districts was constant over the years. Thus there was sluggish forward movement in terms of infrastructural development in the districts of Odisha.

The study of progress in the general higher education sector and inter-district disparities in higher education facilities in the state of Haryana carried out in [6] through factor analysis. The study was based on secondary data cited from Census Reports, Economic Survey of Haryana, etc. which finds that there was of intra-state disparities presented in terms of access of general higher education as well as in terms of Gross Enrolment Ratio as some districts indicated good performance and few were lag behind.

The achievements of the Education System in the international context and its comparison from China on the basis of access have been made in [10]. It was founded that Indian performance was better than its neighbors in some indicators but lags in comparison of countries such as BRIC in broad and China in school education. The study discussed the major public initiative in the education sector. It was descriptive research based on data collected through UNESCO, Ministry of Human Resource & Development (MHRD), etc. Gender parity index was used to identify the schools' gross enrollment ratio, and the result shows that primary school enrollment has become very near-universal, and the literacy ratio has grown recently. It showed that private-sector schooling on the rise fast in town regions than in villages in primary schools.

4. Objectives of the Study

- Delineating the school education development in the Indian States, including its Union Territories (UTs).
- Ranking of Indian States including UTs for School Education on the basis of Educational Development Index (EDI).
- Defining the categories of the states and UT's on the basis of their educational development.

5. Methodology and Data

The present study is conducted by taking secondary data prepared by DISE-2016-17 for State Report Cards and Flash Statistics, National Institute of Educational Planning and Administration (NIEPA). A composite index

is constructed with proposed indicators to measure the development of education in the 36 states (includes 29 states and 7 UT's) of India. Based on the values in the index, the states and UT's are ranked as developed, moderately developed, and less developed.

For constructing the composite index which is known as Educational Development Index (EDI), the Principal Component Analysis (PCA) has been used.

The PCA is a type of factor analysis that abates the data set's dimensionality but keeps most of the actual variability in it. There is much variability in the data as possible in the first principal component, and each following components consider for as much of the remaining variability as possible. Before applying PCA, the data are normalized by the following formula:

$$NV_{ij} = \frac{observed\ X_{ij} - Worst\ X_i}{Best\ X_i - Worst\ X_i}$$

6. Proposed Education Development Index (EDI) Structure

Through an EDI, the States' and Districts' positions at different levels of education can be estimated. It shows the development of education in the states and districts of a country by ranking them according to the values obtained in the construction of the index. By multiplying the weights with a normalized value of an indicator and then dividing it by total weights, we obtained the result value called an EDI. The mathematical formula of an EDI is as below:

$$EDI = \sum_{i=1}^{n} X_i W_{ij} \div \sum_{i=1}^{n} W_{ij}$$

Where,

EDI = the Index value of the educational development

Xi = the Normalized Value of the jth indicator

Wij = the weight of the ith indicator in the jth variable

To construct State-wise EDI for the year 2016-17, we took the following 22 indicators and divided them into four dimensions as Access, Infrastructure, Teacher, and Outcome:

Table 1: Education Influencing Indicators

Dimensions	Indicators
Access	Primary to Upper Primary Schools/sections Ratio
	Ratio of Upper primary to Secondary Schools/sections
	Ratio of Secondary to Senior Secondary Schools/sections
	Availability of Schools per 000's population
	Density of Schools per 10 square kilometer (sq.km.)
Infrastructure	Percentage of Schools with Playground Facility
	Percentage of Schools having Girls Toilet
	Percentage of Schools having Boys Toilet
	Percentage of Schools with Drinking Water Facility
	Percentage of Schools with Electricity
	Percentage of Schools having Computers
Teacher's	Percentage of Single Teacher Schools
	Percentage of Female Teachers
	Ratio of Pupil Teacher(PTR)
	Average Teachers per School
Outcome	Ratio of Girls to Boys Enrolment
	% of Girls Enrolment
	Dropout Rate
	Transition Rate
	Repetition Rate
	Participation of SCs Children*
	Participation of ST Children**

*Percent of SCs population - percent of SCs enrollment.

**Percent of ST population - percent of ST enrollment.

We have used the following computer software/tools for the construction of EDI, analyzing and calculations of results & data as per our study requirement:

− IBM Statistical Package for Social Sciences (SPSS)
− Microsoft Excel.

7. Analysis and Results

The composite index of four dimensions has been described in table 2, which shows categories and ranks provided to the states according to their educational development at the primary level. The index of the four dimensions was calculated by applying the PCA method after normalizing the raw data collected from DISE 2016-17 publications. The EDI has been constructed for the States by multiplying each value of the dimension with their obtained weights through PCA method and dividing it by sum of the weights.

7.1 Method of Categorizing States

The categorization of the states on all four levels of education has been done by applying Inter Quartile Range method, which provides the range for a series that can be further divided or categorized into different groups. In the present study, the states have been categorized as:

1 = developed states
2 = moderately developed states
3 = less developed states.

Thus for calculating the interquartile range and categorizing states into three groups, maximum and minimum values of each dimension have been calculated first, and then the following formula is applied:

$$\text{Maximum} - \left(\frac{\text{Maximum} - \text{Minimum}}{3} \right)$$

A = Maximum Value of series
B = Minimum Value of Series
C = Maximum Value for Developed State = A (Inclusive)
D = Minimum Value for Developed State = A-(A-B)/3

E = Maximum Value for Moderately Developed State = D (inclusive)
F = Minimum Value for Moderately Developed State = E-(A-B)/3 (inclusive)
G = Maximum Value for Less Developed State = F
H = Minimum Value for Moderately Developed State = B (Inclusive)

7.2 Educational Development Index (EDI) at Primary Education Level

Primary education level is basic education, or the first step where an individual starts developing his/ her skills should be more focused by the Government in their plans and policies. In the present study, we have developed the composite index of primary level to know the development of the States to provide categories as developed, moderately developed & less developed and rank them according to their EDI obtained.

Table 2: Category Ranges for Primary Education Level

Dimensions	Developed	Moderately Developed states	Less Developed States
Access Index	0.797 to 0.578	0.578 to 0.360	0.360 to 142
Infrastructure Index	0.950 to 0.671	0.671 to 0.386	0.386 to 0.102
Teacher's Index	0.825 to 0.718	0.718 to 0.612	0.612 to 0.506
Outcome Index	0.803 to 0.658	0.658 to 0.513	0.513 to 0.369

Table 3: EDI of States at Primary Education Level

State Name	Index (Category*)				EDI	Rank
	Access	Infrastructure	Teacher	Outcome		
Andaman & Nicobar island	0.198 (3)	0.834 (1)	0.824 (1)	0.734 (1)	0.603	10
Andhra Pradesh	0.199 (3)	0.758 (1)	0.632 (2)	0.702 (1)	0.544	18
Arunachal Pradesh	0.172 (3)	0.351 (3)	0.509 (3)	0.569 (2)	0.356	34
Assam	0.166 (3)	0.219 (3)	0.644 (2)	0.768 (1)	0.368	33
Bihar	0.27 (3)	0.204 (3)	0.557 (3)	0.568 (2)	0.347	35
Chandigarh	0.797 (1)	0.892 (1)	0.602 (3)	0.4 (3)	0.724	1
Chhattisgarh	0.211 (3)	0.723 (1)	0.676 (2)	0.729 (1)	0.547	17
Dadra and Nagar Haveli	0.244 (3)	0.82 (1)	0.799 (1)	0.572 (2)	0.579	13
Daman and Diu	0.338 (3)	0.872 (1)	0.696 (2)	0.54 (2)	0.606	9
Delhi	0.581 (1)	0.956 (1)	0.566 (3)	0.611 (2)	0.709	2
Goa	0.184 (3)	0.81 (1)	0.695 (2)	0.751 (1)	0.574	14
Gujarat	0.292 (3)	0.866 (1)	0.723 (1)	0.736 (1)	0.63	6
Haryana	0.292 (3)	0.827 (1)	0.645 (2)	0.532 (2)	0.567	15
Himachal Pradesh	0.219 (3)	0.833 (1)	0.739 (1)	0.76 (1)	0.602	11
Jammu & Kashmir	0.202 (3)	0.434 (2)	0.72 (1)	0.55 (2)	0.421	31
Jharkhand	0.219 (3)	0.584 (2)	0.506 (3)	0.449 (3)	0.426	30
Karnataka	0.256 (3)	0.68 (1)	0.698 (2)	0.727 (1)	0.551	16
Kerala	0.264 (3)	0.891 (1)	0.784 (1)	0.674 (1)	0.626	7
Lakshadweep	0.36 (3)	0.887 (1)	0.561 (3)	0.759 (1)	0.64	3
Madhya Pradesh	0.223 (3)	0.551 (2)	0.617 (2)	0.587 (2)	0.459	29
Maharashtra	0.232 (3)	0.812 (1)	0.692 (2)	0.744 (1)	0.589	12
Manipur	0.182 (3)	0.58 (2)	0.711 (2)	0.545 (2)	0.461	28
Meghalaya	0.189 (3)	0.102 (3)	0.742 (1)	0.512 (3)	0.303	36
Mizoram	0.266 (3)	0.675 (1)	0.746 (1)	0.632 (2)	0.542	19
Nagaland	0.242 (3)	0.439 (2)	0.728 (1)	0.369 (3)	0.403	32
Odisha	0.249 (3)	0.566 (2)	0.743 (1)	0.721 (1)	0.516	23
Puducherry	0.385 (2)	0.946 (1)	0.796 (1)	0.421 (3)	0.638	4
Punjab	0.282 (3)	0.867 (1)	0.768 (1)	0.657 (2)	0.619	8
Rajasthan	0.263 (3)	0.575 (2)	0.538 (3)	0.585 (2)	0.468	27
Sikkim	0.185 (3)	0.684 (1)	0.773 (1)	0.495 (3)	0.496	26
Tamil Nadu	0.214 (3)	0.885 (1)	0.825 (1)	0.803 (1)	0.638	5
Telengana	0.237 (3)	0.695 (1)	0.631 (2)	0.717 (1)	0.538	20
Tripura	0.233 (3)	0.576 (2)	0.701 (2)	0.692 (1)	0.503	25
Uttar Pradesh	0.272 (3)	0.704 (1)	0.626 (2)	0.536 (2)	0.517	22
Uttarakhand	0.214 (3)	0.67 (2)	0.728 (1)	0.646 (2)	0.523	21
West Bengal	0.142 (3)	0.703 (1)	0.705 (2)	0.627 (2)	0.503	24

* Indicates category of the state as Developed (1), Moderately Developed (2) and Less Developed (3)

Table 3 depicts that most of the States leys in the less developed category. Only one state was in the developed and moderately developed category in terms of Access Index, Chandigarh, and Puducherry. While providing infrastructure in Primary schools, most of the States are in the developed and moderately developed categories. In terms of teacher's index, only a few the States are less developed, such as Rajasthan, Lakshadweep, Jharkhand, Delhi, Chandigarh, Bihar, and Arunachal Pradesh.
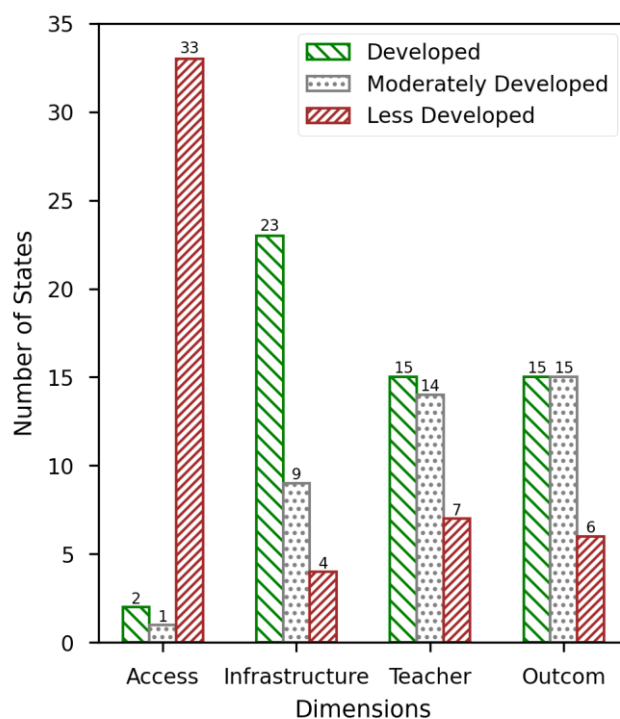
Fig 1: No of States in Categories based on Primary Education Level Dimension Index

The outcome index shows that most of the States are performed at a moderate development level. In figure 1, categorization of the states according to their dimension index value has been disseminated, which shows that States highly developed in having infrastructure facilities at the primary level than the other three dimensions and are equally developed in terms of teacher and outcome dimensions. At the same time, access shows the highest number of less developed states, which indicates an immediate need to reform and implement new policies and plans for increasing the density, availability, and ratio to upper primary schools or sections of primary education.

7.3 EDI at Upper Primary Level-

Table 4: Range for categorization of states at upper primary level

Dimensions	Developed	Moderately Developed states	Less Developed States
Access Index	0.778 to 0.520	0.520 to 0.626	0.626 to 0.005
Infrastructure Index	0.929 to 0.753	0.753 to 0.578	0.578 to 0.403
Teacher's Index	1.00 to 0.666	0.666 to 0.333	0.333to 0.00
Outcome Index	1.408 to 0.811	0.811 to 0.575	0.575 to 0.339

Table 5: EDI of States at Upper Primary Level

State Name	Index (Category)				EDI	Rank
	Access	Infrastructure	Teacher	Outcome		
Andaman & Nicobar island	0.017 (3)	0.789 (1)	0.000 (3)	0.685 (2)	0.4	34
Andhra Pradesh	0.010 (3)	0.868 (1)	0.87 (1)	0.725 (2)	0.66	10
Arunachal Pradesh	0.045 (3)	0.637 (2)	0.913 (1)	0.580 (2)	0.57	25
Assam	0.359 (2)	0.734 (2)	0.599 (2)	0.731 (2)	0.62	16
Bihar	0.229 (3)	0.600 (2)	0.706 (1)	0.572 (3)	0.54	27
Chandigarh	0.114 (3)	0.789 (1)	0.000 (3)	0.985 (1)	0.51	31
Chhattisgarh	0.368 (2)	0.691 (2)	0.778 (1)	0.690 (2)	0.65	11
Dadra and Nagar Haveli	0.258 (3)	0.929 (1)	0.837 (1)	0.667 (2)	0.7	3
Daman and Diu	0.330 (2)	0.773 (1)	0.915 (1)	0.688 (2)	0.7	4

Delhi	0.177 (3)	0.713 (2)	0.861 (1)	0.778 (2)	0.66	8
Goa	0.014 (3)	0.871 (1)	0.933 (1)	0.789 (2)	0.69	6
Gujarat	0.324 (2)	0.732 (2)	0.961 (1)	0.658 (2)	0.69	7
Haryana	0.060 (3)	0.634 (2)	0.869 (1)	0.671 (2)	0.59	21
Himachal Pradesh	0.116 (3)	0.654 (2)	0.822 (1)	0.735 (2)	0.61	18
Jammu & Kashmir	0.057 (3)	0.875 (1)	0.682 (1)	0.592 (2)	0.58	23
Jharkhand	0.093 (3)	0.403 (3)	0.774 (1)	0.457 (3)	0.45	33
Karnataka	0.305 (2)	0.721 (2)	0.816 (1)	0.717 (2)	0.66	9
Kerala	0.078 (3)	0.781 (1)	0.974 (1)	0.339 (3)	0.57	26
Lakshadweep	0.179 (3)	0.612 (2)	0.839 (1)	0.686 (2)	0.6	19
Madhya Pradesh	0.396 (2)	0.438 (3)	0.675 (1)	0.568 (3)	0.53	30
Maharashtra	0.036 (3)	0.54 (3)	0.925 (1)	0.705 (2)	0.58	22
Manipur	0.039 (3)	0.801 (1)	0.754 (1)	0.589 (2)	0.58	24
Meghalaya	0.734 (1)	0.81 (1)	0.587 (2)	0.446 (3)	0.64	14
Mizoram	0.778 (1)	0.78 (1)	0.828 (1)	0.632 (2)	0.75	2
Nagaland	0.019 (3)	0.728 (2)	0.771 (1)	0.354 (3)	0.49	32
Odisha	0.062 (3)	0.652 (2)	0.653 (2)	0.66 (2)	0.54	28
Puducherry	0.086 (3)	0.769 (1)	1.000 (1)	1.048 (1)	0.77	1
Punjab	0.061 (3)	0.726 (2)	0.993 (1)	0.625 (2)	0.63	15
Rajasthan	0.019 (3)	0.817 (1)	0.919 (1)	0.676 (2)	0.64	12
Sikkim	0.005 (3)	0.789 (1)	0.000 (3)	0.469 (3)	0.34	36
Tamil Nadu	0.013 (3)	0.861 (1)	0.935 (1)	0.806 (2)	0.69	5
Telengana	0.013 (3)	0.789 (1)	0.000 (3)	0.623 (2)	0.38	35
Tripura	0.017 (3)	0.762 (1)	1.000 (1)	0.642 (2)	0.64	13
Uttar Pradesh	0.311 (2)	0.646 (2)	0.734 (1)	0.622 (2)	0.59	20
Uttarakhand	0.214 (3)	0.67 (2)	0.728 (1)	0.646 (2)	0.523	21
West Bengal	0.142 (3)	0.703 (1)	0.705 (2)	0.627 (2)	0.503	24

* Indicates category of the state as Developed (1), Moderately Developed (2) and Less Developed (3)
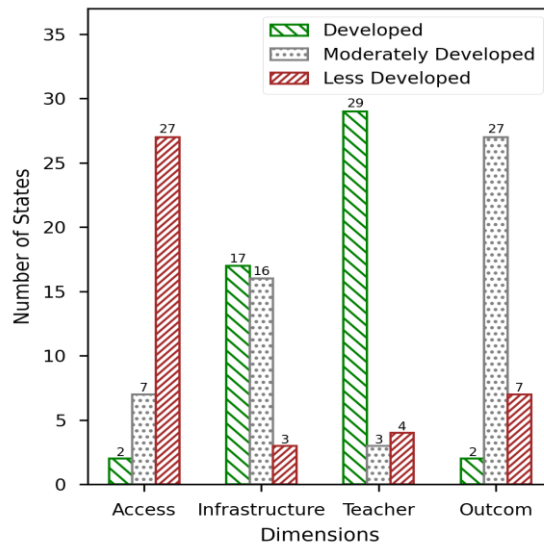

Fig 2: No of States in Categories based on Upper Primary Education Level Dimension Index

Table 5 & figure 2 shows that many states having access to upper primary schools are less developed compared to other dimensions of the educational index.   In contrast to the teacher's index, 29 states are highly

developed, and 27 states that are moderately developed in terms of outcome index are medium rates of dropout and a significant ratio of girls to boys enrollment.

In the case of infrastructure, there is not much difference between developed and moderately developed states than the other indices.

As per the overall EDI values, Puducherry has the highest rank, following the Mizoram, Dadra & Nagar Haveli, Daman & Diu, and Tamil Nadu. Whereas Sikkim, Telengana, Andaman & Nicobar Island, Jharkhand, and Nagaland are the states which obtained the lowest rank or are less developed in terms of all the four dimensions that affect the education level of the states.

7.4 EDI at Elementary Level

Table 6: Range for categorization of states at Elementary Level

Dimension Level	Developed State	Moderately Developed State	Less Developed State
EDI at Primary	0.693 to 0.561	0.561 to 0.517	0.517 to 0.294
EDI at Upper Primary	0.770 to 0.626	0.626 to 0.483	0.483 to 0.340
Composite EDI at Elementary	0.622 to 0.526	0.526 to 0.430	0.430 to 0.335

Table 7: EDI at Elementary Level Education in States

State Name	EDI (Category)			Rank
	Primary Level	Upper Primary Level	Composite	
Andaman and Nicobar island	0.39 (3)	0.4 (3)	0.396 (3)	33
Andhra Pradesh	0.36 (3)	0.66 (1)	0.509 (2)	15
Arunachal Pradesh	0.3 (3)	0.57 (2)	0.433 (2)	30
Assam	0.35 (3)	0.62 (2)	0.485 (2)	23
Bihar	0.37 (3)	0.54 (2)	0.454 (2)	28
Chandigarh	0.69 (1)	0.51 (2)	0.601 (1)	3
Chhattisgarh	0.38 (3)	0.65 (1)	0.514 (2)	14
Dadra and Nagar Haveli	0.39 (3)	0.7 (1)	0.544 (1)	8
Daman and Diu	0.43 (3)	0.7 (1)	0.565 (1)	6
Delhi	0.58 (1)	0.66 (1)	0.622 (1)	1
Goa	0.37 (3)	0.69 (1)	0.529 (1)	11
Gujarat	0.44 (3)	0.69 (1)	0.565 (1)	5
Haryana	0.39 (3)	0.59 (2)	0.49 (2)	20
Himachal Pradesh	0.4 (3)	0.61 (2)	0.504 (2)	16
Jammu & Kashmir	0.34 (3)	0.58 (2)	0.462 (2)	26
Jharkhand	0.31 (3)	0.45 (3)	0.378 (3)	35
Karnataka	0.41 (3)	0.66 (1)	0.535 (1)	9
Kerala	0.42 (3)	0.57 (2)	0.494 (2)	19
Lakshadweep	0.47 (3)	0.6 (2)	0.533 (1)	10
Madhya Pradesh	0.35 (3)	0.53 (2)	0.44 (2)	29
Maharashtra	0.4 (3)	0.58 (2)	0.488 (2)	21
Manipur	0.33 (3)	0.58 (2)	0.454 (2)	27
Meghalaya	0.33 (3)	0.64 (1)	0.486 (2)	22
Mizoram	0.41 (3)	0.75 (1)	0.578 (1)	4
Nagaland	0.34 (3)	0.49 (2)	0.414 (3)	32

Odisha	0.41 (3)	0.54 (2)	0.476 (2)	25
Puducherry	0.45 (3)	0.77 (1)	0.611 (1)	2
Punjab	0.42 (3)	0.63 (1)	0.527 (1)	12
Rajasthan	0.36 (3)	0.64 (1)	0.502 (2)	17
Sikkim	0.33 (3)	0.34 (3)	0.335 (3)	36
Tamil Nadu	0.42 (3)	0.69 (1)	0.553 (1)	7
Telengana	0.39 (3)	0.38 (3)	0.383 (3)	34
Tripura	0.39 (3)	0.64 (1)	0.514 (2)	13
Uttar Pradesh	0.37 (3)	0.59 (2)	0.482 (2)	24
Uttarakhand	0.37 (3)	0.62 (2)	0.496 (2)	18
West Bengal	0.32 (3)	0.53 (2)	0.423 (3)	31

Table 7 shows the development of education at the elementary level individually as well as composite indices and ranks for the composite indices of the states of India. The composite index depicts that states like Delhi, Puducherry, Chandigarh, Nagaland, and Gujarat are the topmost States having the highest EDI. In contrast, states such as Sikkim, Jharkhand, Andaman & Nicobar and Telengana are ranked as less developed states in education in the country. Chandigarh (0.69), Delhi (0.58) and Lakshadweep (0.47) states have the highest EDI at the primary level, while Puducherry (0.77), Mizoram (0.75), and Dadra & Nagar Haveli (0.70) are at the top in the EDI at upper primary level. It indicates that there are immense differences in educational development at the elementary level in the states. At the primary level, the less developed states are Arunachal Pradesh, West Bengal, and Manipur, with 0.30, 0.32, and 0.33 EDI values, respectively.
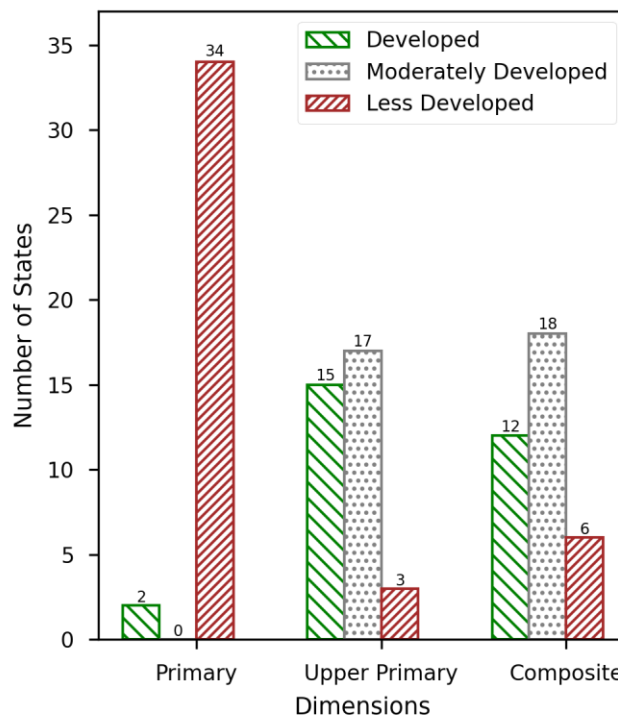

Fig: 3 No of States having Elementary Level Education Development

In the case of Educational Development Index of Primary level (fig: 3), many states fall into less developed category while only 2 states, Chandigarh and Delhi, show significant development, and no State is moderately developed accordingly. A reverse situation has been found at the upper primary level, where most states are developed and moderately developed compared to EDI at the primary level. But the composite index shows that the situation of elementary level of states is not worst as the individual indices are showing it is because most of the States lie in moderately developed and developed category in composite EDI. Thus our study reveals that there is the existence of differences such as low enrolments of children, high repetition rates, lack of

primary and upper primary teachers, etc., in the elementary education levels in the Indian States, thus immediate steps have to be taken for more improvement in elementary education.

7.5 EDI at Secondary Education Level

Table 8 shows education development in the four dimensions: access, teacher, infrastructure, and outcome. A composite EDI has been computed for these dimensions for states of India at the secondary education level. Further, the states have been categorized as developed, moderately, and less developed based on their individual indices values.

Table 8: Range for categorization of states at secondary level

Dimensions	Developed State	Moderately Developed state	Less Developed State
Access Index	0.406 to 0.274	0.274 to 0.142	0.142 to 0.010
Teacher's Index	0.886 to 0.730	0.730 to 0.574	0.574 to 0.418
Infrastructure Index	0.749 to 0.608	0.608 to 0.466	0.466 to 0.325
Outcome Index	0.712 to 0.585	0.585 to 0.457	0.457 to 0.330

Table 9: EDI of Secondary Education Level

State Name	Index (Category)				EDI	Rank
	Access	Infrastructure	Teacher	Outcome		
Andaman & Nicobar island	0.01 (3)	0.729 (2)	0.683 (1)	0.66 (1)	0.578	6
Andhra Pradesh	0.302 (1)	0.803 (1)	0.627 (1)	0.569 (2)	0.59	3
Arunachal Pradesh	0.014 (3)	0.729 (2)	0.325 (3)	0.331 (3)	0.355	36
Assam	0.12 (3)	0.596 (2)	0.669 (1)	0.65 (1)	0.562	10
Bihar	0.032 (3)	0.418 (3)	0.475 (2)	0.476 (2)	0.394	34
Chandigarh	0.331 (1)	0.729 (2)	0.388 (3)	0.36 (3)	0.435	33
Chhattisgarh	0.03 (3)	0.67 (2)	0.58 (2)	0.579 (2)	0.51	23
Dadra and Nagar Haveli	0.047 (3)	0.575 (2)	0.515 (2)	0.511 (2)	0.451	31
Daman and Diu	0.127 (3)	0.658 (2)	0.499 (2)	0.491 (2)	0.468	29
Delhi	0.406 (1)	0.729 (2)	0.645 (1)	0.633 (1)	0.62	1
Goa	0.055 (3)	0.57 (3)	0.524 (2)	0.5 (2)	0.451	32
Gujarat	0.046 (3)	0.595 (2)	0.689 (1)	0.653 (1)	0.558	11
Haryana	0.054 (3)	0.508 (3)	0.641 (1)	0.603 (1)	0.511	22
Himachal Pradesh	0.026 (3)	0.729 (2)	0.551 (2)	0.525 (2)	0.494	26
Jammu & Kashmir	0.033 (3)	0.563 (3)	0.564 (2)	0.537 (2)	0.471	28
Jharkhand	0.043 (3)	0.446 (3)	0.749 (1)	0.712 (1)	0.568	8
Karnataka	0.127 (3)	0.647 (2)	0.502 (2)	0.466 (2)	0.459	30
Kerala	0.038 (3)	0.626 (2)	0.614 (1)	0.603 (1)	0.522	21
Lakshadweep	0.126 (3)	0.729 (2)	0.511 (2)	0.518 (2)	0.494	25
Madhya Pradesh	0.052 (3)	0.64 (2)	0.696 (1)	0.659 (1)	0.572	7
Maharashtra	0.038 (3)	0.69 (2)	0.625 (1)	0.6 (1)	0.537	16
Manipur	0.049 (3)	0.706 (2)	0.608 (1)	0.597 (1)	0.535	18
Meghalaya	0.231 (2)	0.626 (2)	0.69 (1)	0.68 (1)	0.602	2
Mizoram	0.346 (1)	0.68 (2)	0.59 (2)	0.577 (2)	0.565	9
Nagaland	0.038 (3)	0.568 (3)	0.666 (1)	0.643 (1)	0.54	15
Odisha	0.064 (3)	0.596 (2)	0.587 (2)	0.558 (2)	0.497	24
Puducherry	0.224 (2)	0.729 (2)	0.582 (2)	0.545 (2)	0.542	14
Punjab	0.058 (3)	0.886 (1)	0.64 (1)	0.604 (1)	0.584	4

Rajasthan	0.03 (3)	0.729 (2)	0.541 (2)	0.505 (2)	0.485	27
Sikkim	0.022 (3)	0.729 (2)	0.599 (2)	0.567 (2)	0.522	20
Tamil Nadu	0.034 (3)	0.755 (1)	0.602 (2)	0.582 (2)	0.535	17
Telengana	0.065 (3)	0.729 (2)	0.379 (3)	0.335 (3)	0.382	35
Tripura	0.04 (3)	0.603 (2)	0.666 (1)	0.648 (1)	0.549	12
Uttar Pradesh	0.044 (3)	0.527 (3)	0.686 (1)	0.658 (1)	0.545	13
Uttarakhand	0.032 (3)	0.687 (2)	0.7 (1)	0.672 (1)	0.583	5
West Bengal	0.035 (3)	0.729 (2)	0.617 (1)	0.577 (2)	0.534	19

The composite EDI shows that only 2, i.e., Delhi and Meghalaya, have 60 percent development at the secondary level in the country than the other States. In comparison, most of the States are 50 percent developed, and only a few States are considered as less developed States.

But as we see the index of four dimensions, it reveals that many states have obtained the less developed category in terms of access and are moderately developed in the infrastructure facilities index. The States, such as Mizoram, Delhi and Andhra Pradesh, are highly developed states in access index, but as we consider their index values, these states are only 40 to 30 percent developed, indicating the poor development of the states in terms of school access. Whereas in infrastructure, these three states have the highest value of development and Andhra Pradesh is the state which has more than 70 percent developed infrastructure facilities.
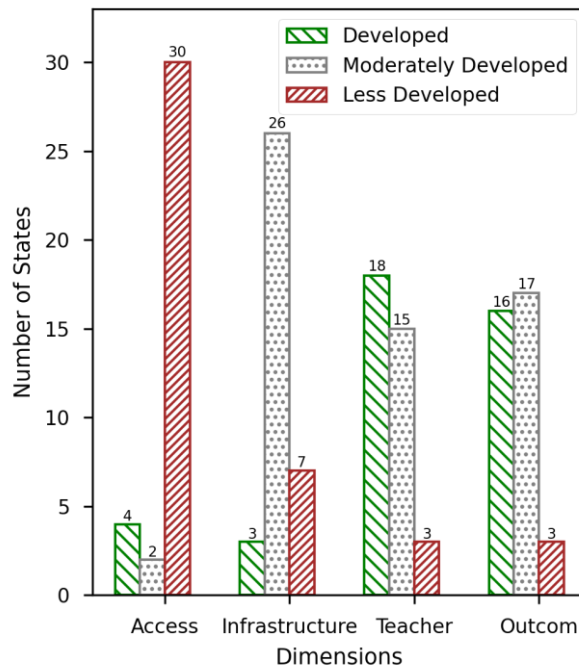

Fig. 4: No of States at Secondary Education Level

The categorization of the states has been analyzed in figure 4, which indicates that there are huge differences in the states at different dimensions. In the case of access, teacher, and outcome index, there is no much difference in developed and moderately developed states, but in the case of infrastructure, only three states are categorized as developed states, and 26 states are under the moderately developed category. Telengana, Arunachal Pradesh and Chandigarh are the states that are categorized as the less developed category in the teacher and outcome index.

7.6 EDI at Senior Secondary Level

Table 10: Range for categorization of states at senior secondary education level

Dimensions	Developed State	Moderately Developed State	Less Developed State
Access Index	0.510 to 0.340	0.340 to 0.170	0.170 to 0.000
Teacher's Index	0.870 to 0.676	0.676 to 0.483	0.483 to 0.290

| Infrastructure Index | 0.980 to 0.653 | 0.653 to 0.326 | 0.326 to 0.000 |
| Outcome Index | 0.750 to 0.643 | 0.643 to 0.536 | 0.536 to 0.430 |

Table 11: EDI of Senior Secondary Education Level

| State Name | Index (Category) | | | | EDI | Rank |
	Access	Infrastructure	Teacher	Outcome		
Andaman & Nicobar island	0.01 (3)	0.77 (1)	0 (3)	0.62 (2)	0.371225	32
Andhra Pradesh	0.01 (3)	0.77 (1)	0 (3)	0.43 (3)	0.313982	36
Arunachal Pradesh	0 (3)	0.77 (1)	0.7 (1)	0.63 (2)	0.600453	22
Assam	0.02 (3)	0.68 (1)	0.73 (1)	0.64 (2)	0.594538	23
Bihar	0.02 (3)	0.45 (3)	0.81 (1)	0.59 (2)	0.550798	27
Chandigarh	0.28 (2)	0.77 (1)	0 (3)	0.46 (3)	0.359702	33
Chhattisgarh	0.01 (3)	0.69 (1)	0.86 (1)	0.69 (1)	0.652884	14
Dadra and Nagar Haveli	0.02 (3)	0.29 (3)	0.83 (1)	0.57 (2)	0.513233	29
Daman and Diu	0.09 (3)	0.81 (1)	0.9 (1)	0.61 (2)	0.681185	8
Delhi	0.5 (1)	0.87 (1)	0.85 (1)	0.64 (2)	0.743936	1
Goa	0.02 (3)	0.74 (1)	0.92 (1)	0.73 (1)	0.697688	7
Gujarat	0.02 (3)	0.73 (1)	0.91 (1)	0.63 (2)	0.661931	11
Haryana	0.04 (3)	0.71 (1)	0.98 (1)	0.68 (1)	0.697715	6
Himachal Pradesh	0.02 (3)	0.79 (1)	0.95 (1)	0.69 (1)	0.707278	5
Jammu & Kashmir	0 (3)	0.55 (2)	0.86 (1)	0.6 (2)	0.591125	24
Jharkhand	0.01 (3)	0.49 (2)	0.8 (1)	0.67 (1)	0.579801	25
Karnataka	0.02 (3)	0.78 (1)	0.75 (1)	0.58 (2)	0.606738	21
Kerala	0 (3)	0.84 (1)	0.93 (1)	0.73 (1)	0.721998	3
Lakshadweep	0.18 (2)	0.77 (1)	0 (3)	0.63 (2)	0.397334	31
Madhya Pradesh	0.01 (3)	0.76 (1)	0.85 (1)	0.65 (1)	0.654225	13
Maharashtra	0.01 (3)	0.63 (2)	0.93 (1)	0.68 (1)	0.658363	12
Manipur	0.01 (3)	0.67 (2)	0.87 (1)	0.68 (1)	0.648367	15
Meghalaya	0.01 (3)	0.81 (1)	0.74 (1)	0.68 (1)	0.63939	18
Mizoram	0.02 (3)	0.78 (1)	0.74 (1)	0.67 (1)	0.630603	19
Nagaland	0.01 (3)	0.73 (1)	0.84 (1)	0.64 (2)	0.640828	17
Odisha	0.01 (3)	0.62 (2)	0.8 (1)	0.43 (3)	0.538402	28
Puducherry	0.15 (3)	0.61 (2)	0.89 (1)	0.69 (1)	0.662637	10
Punjab	0.04 (3)	0.83 (1)	0.95 (1)	0.7 (1)	0.722518	2
Rajasthan	0.02 (3)	0.77 (1)	0 (3)	0.55 (2)	0.351494	34
Sikkim	0.01 (3)	0.77 (1)	0 (3)	0.75 (1)	0.410391	30
Tamil Nadu	0.02 (3)	0.79 (1)	0.95 (1)	0.71 (1)	0.713303	4
Telengana	0.51 (1)	0.55 (2)	0.84 (1)	0.58 (2)	0.647884	16
Tripura	0.02 (3)	0.77 (1)	0 (3)	0.53 (3)	0.345468	35
Uttar Pradesh	0.03 (3)	0.44 (3)	0.73 (1)	0.7 (1)	0.556911	26
Uttarakhand	0.02 (3)	0.81 (1)	0.78 (1)	0.71 (1)	0.662791	9
West Bengal	0.04 (3)	0.67 (2)	0.74 (1)	0.69 (1)	0.613192	20

Table 11 shows the development of education at the senior secondary level in states of the four dimensions and the composite index (EDI) of the States with their ranks assigned according to their EDI value. It indicates that most States are less developed at the secondary level in terms of access, which is similar to secondary level

education. Only two states with 50 percent EDI are highly developed in school access. The situation of other indices is good as compare to access. In the context of overall EDI, 5 States have more than 70 percent EDI value, and 6 States with 30 percent EDI.

The fig. 5 reveals that only 2 states comes under the developed as well as moderately developed in school access while there are no states which are moderately developed in teacher outcome. Again it shows that highest number of states is less developed in access as compared to other indices. Large numbers of states that are developed are in teacher index following by infrastructure and outcome indices. There are 14 states in the outcome index which come under the moderately developed category while there are 8 states in infrastructure that falls in this category.
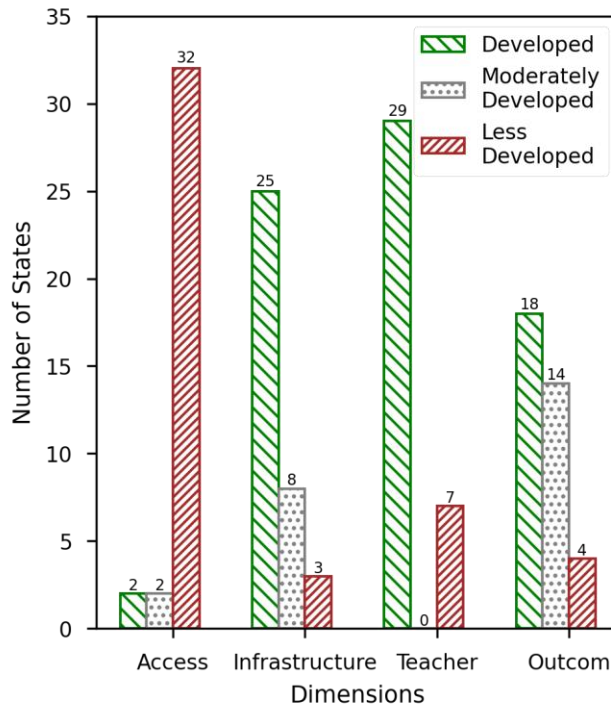

Fig 5: No of States at Secondary level Education

7.7 EDI of Secondary and Senior Secondary Education level

Table 12 shows the EDI of secondary and senior secondary level as well as a composite index of both secondary and senior secondary level for the states, which reveals that states are more developed at senior secondary level education than secondary level. The states with the highest EDI at the secondary level are Meghalaya with a 0.600 EDI value following by Andhra Pradesh, Andaman Nicobar, Mizoram and Madhya Pradesh having EDI value of more than 50 percent.

Table 12: Composite EDI at Secondary and Senior Secondary Education Level

State Name	EDI (Category)			Rank
	Secondary Level	Senior Secondary Level	Composite	
Andaman and Nicobar island	0.58 (1)	0.37 (3)	0.475	29
Andhra Pradesh	0.59 (1)	0.31 (3)	0.450	33
Arunachal Pradesh	0.36 (3)	0.6 (1)	0.480	27
Assam	0.56 (1)	0.6 (1)	0.580	16
Bihar	0.39 (3)	0.55 (2)	0.470	30
Chandigarh	0.44 (3)	0.36 (3)	0.400	36
Chhattisgarh	0.51 (2)	0.65 (1)	0.580	16

| Dadra and Nagar Haveli	0.45 (2)	0.51 (2)	0.480	28
Daman and Diu	0.47 (2)	0.68 (1)	0.575	18
Delhi	0.62 (1)	0.74 (1)	0.680	1
Goa	0.45 (2)	0.7 (1)	0.575	18
Gujarat	0.56 (1)	0.66 (1)	0.610	7
Haryana	0.51 (2)	0.7 (1)	0.605	9
Himachal Pradesh	0.49 (2)	0.71 (1)	0.600	10
Jammu & Kashmir	0.47 (2)	0.59 (2)	0.530	24
Jharkhand	0.57 (1)	0.58 (2)	0.575	20
Karnataka	0.46 (2)	0.61 (1)	0.535	23
Kerala	0.52 (2)	0.72 (1)	0.620	4
Lakshadweep	0.49 (2)	0.4 (3)	0.445	34
Madhya Pradesh	0.57 (1)	0.65 (1)	0.610	8
Maharashtra	0.54 (1)	0.66 (1)	0.600	10
Manipur	0.54 (1)	0.65 (1)	0.595	14
Meghalaya	0.6 (1)	0.64 (1)	0.620	6
Mizoram	0.57 (1)	0.63 (1)	0.600	13
Nagaland	0.54 (1)	0.64 (1)	0.590	15
Odisha	0.5 (2)	0.54 (2)	0.520	25
Puducherry	0.54 (1)	0.66 (1)	0.600	10
Punjab	0.58 (1)	0.72 (1)	0.650	2
Rajasthan	0.49 (2)	0.35 (3)	0.420	35
Sikkim	0.52 (2)	0.41 (3)	0.465	31
Tamil Nadu	0.54 (1)	0.71 (1)	0.625	3
Telengana	0.38 (3)	0.65 (1)	0.515	26
Tripura	0.55 (1)	0.35 (3)	0.450	32
Uttar Pradesh	0.55 (1)	0.56 (2)	0.555	22
Uttarakhand	0.58 (1)	0.66 (1)	0.620	4
West Bengal	0.53 (2)	0.61 (1)	0.570	21
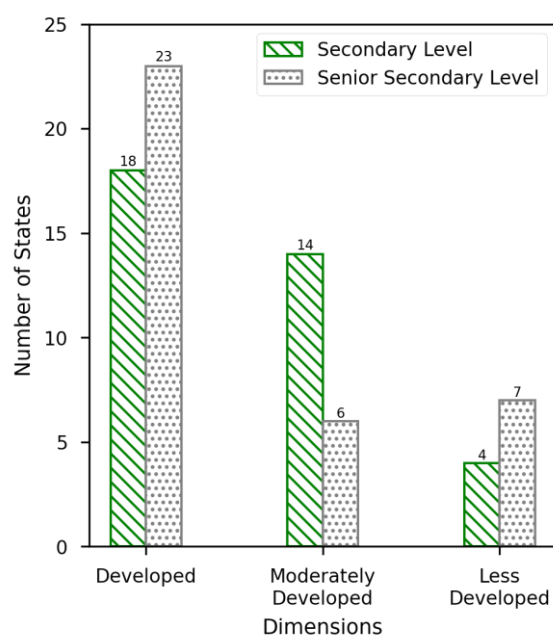
Fig 6: No of States at Secondary & Sr Secondary Education Level

Only four states such as Telengana, Bihar, Chandigarh, and Arunachal Pradesh are categorized as less developed states at the secondary level. Where in context of senior secondary education level development, it is considered that most of the states are developed, such as Delhi (0.740), Punjab (0.720) and Himachal Pradesh (0.720), etc. Delhi has the highest EDI value in composite EDI following Punjab, Tamil Nadu, Kerala, and Uttarakhand. While Chandigarh, Rajasthan, Lakshadweep and Arunachal Pradesh are the States with the lowest EDI value and are considered lees developed states at the secondary and senior secondary levels of education.

As per figure 6, 23 states are developed in the context of senior secondary level education, and only 18 states are developed at the secondary level of education. It reveals a high rate of moderately developed States compared to senior secondary level education. More States are categorized as less developed in senior secondary level than secondary level education.

7.8 EDI of School Education

Table 13: Range for categorization of states at School Education

Dimensions Level	Developed State	Moderately Developed State	Less Developed State
Primary	0.750 to 0.610	0.610 to 0.470	0.470 to 0.330
Upper Primary	0.770 to 0.626	0.626 to 0.483	0.483 to 0.340
Secondary	0.620 to 0.533	0.533 to 0.446	0.446 to 0.360
Senior Secondary	0.740 to 0.596	0.596 to 0.453	0.453 to 0. 310

Table 14: A Composite EDI of School Education in States

State Name	EDI (Category)				Composite EDI	Rank
	Primary	Upper Primary	Secondary	Senior Secondary		
Andaman & Nicobar island	0.63 (1)	0.4 (3)	0.58 (1)	0.37 (3)	0.479	34
Andhra Pradesh	0.56 (2)	0.66 (1)	0.59 (1)	0.31 (3)	0.534	26
Arunachal Pradesh	0.37 (3)	0.57 (2)	0.36 (3)	0.6 (1)	0.492	33
Assam	0.37 (3)	0.62 (2)	0.56 (1)	0.6 (1)	0.546	22
Bihar	0.37 (3)	0.54 (2)	0.39 (3)	0.55 (2)	0.475	35
Chandigarh	0.75 (1)	0.51 (2)	0.44 (3)	0.36 (3)	0.514	29
Chhattisgarh	0.57 (2)	0.65 (1)	0.51 (2)	0.65 (1)	0.605	13
Dadra and Nagar Haveli	0.59 (2)	0.7 (1)	0.45 (2)	0.51 (2)	0.579	16
Daman and Diu	0.66 (1)	0.7 (1)	0.47 (2)	0.68 (1)	0.643	7
Delhi	0.65 (1)	0.66 (1)	0.62 (1)	0.74 (1)	0.671	2
Goa	0.59 (2)	0.69 (1)	0.45 (2)	0.7 (1)	0.625	8
Gujarat	0.69 (1)	0.69 (1)	0.56 (1)	0.66 (1)	0.658	4
Haryana	0.61 (2)	0.59 (2)	0.51 (2)	0.7 (1)	0.608	11
Himachal Pradesh	0.63 (1)	0.61 (2)	0.49 (2)	0.71 (1)	0.618	10
Jammu & Kashmir	0.46 (3)	0.58 (2)	0.47 (2)	0.59 (2)	0.534	25
Jharkhand	0.42 (3)	0.45 (3)	0.57 (1)	0.58 (2)	0.499	31
Karnataka	0.59 (2)	0.66 (1)	0.46 (2)	0.61 (1)	0.594	15
Kerala	0.67 (1)	0.57 (2)	0.52 (2)	0.72 (1)	0.623	9
Lakshadweep	0.64 (1)	0.6 (2)	0.49 (2)	0.4 (3)	0.537	23
Madhya Pradesh	0.48 (2)	0.53 (2)	0.57 (1)	0.65 (1)	0.557	21
Maharashtra	0.63 (1)	0.58 (2)	0.54 (1)	0.66 (1)	0.605	14
Manipur	0.47 (2)	0.58 (2)	0.54 (1)	0.65 (1)	0.565	17
Meghalaya	0.33 (3)	0.64 (1)	0.6 (1)	0.64 (1)	0.56	20

Mizoram	0.61 (2)	0.75 (1)	0.57 (1)	0.63 (1)	0.653	5
Nagaland	0.44 (3)	0.49 (2)	0.54 (1)	0.64 (1)	0.526	27
Odisha	0.56 (2)	0.54 (2)	0.5 (2)	0.54 (2)	0.537	24
Puducherry	0.65 (1)	0.77 (1)	0.54 (1)	0.66 (1)	0.671	1
Punjab	0.66 (1)	0.63 (1)	0.58 (1)	0.72 (1)	0.651	6
Rajasthan	0.5 (2)	0.64 (1)	0.49 (2)	0.35 (3)	0.505	30
Sikkim	0.51 (2)	0.34 (3)	0.52 (2)	0.41 (3)	0.431	36
Tamil Nadu	0.67 (1)	0.69 (1)	0.54 (1)	0.71 (1)	0.663	3
Telengana	0.58 (2)	0.38 (3)	0.38 (3)	0.65 (1)	0.496	32
Tripura	0.53 (2)	0.64 (1)	0.55 (1)	0.35 (3)	0.523	28
Uttar Pradesh	0.54 (2)	0.59 (2)	0.55 (1)	0.56 (2)	0.563	18
Uttarakhand	0.55 (2)	0.62 (2)	0.58 (1)	0.66 (1)	0.607	12
West Bengal	0.58 (2)	0.53 (2)	0.53 (2)	0.61 (1)	0.562	19

Table 14 shows the EDI of school education in the Indian States for 2016-17, along with the categories defined to the states according to different school education levels. It reveals that the States like Delhi, Punjab, Puducherry and Tamil Nadu lies in the developed category at every level of education having EDI across 60 percent. But these states have obtained different ranks in the composite index of educational development. It shows that Puducherry is ranked first in the composite index while Delhi and Tamil Nadu received a second and third rank in the composite index. Punjab, which falls in the developed category at each level of education, has been ranked sixth in the composite index, while Gujarat and Mizoram obtain the fourth and fifth ranks. Sikkim, Bihar, Andaman & Nicobar, and Arunachal Pradesh States have the lowest positions in the composite education development index.

According to the categorization in figure 7, States are more developed at the senior secondary level of education following Secondary, Upper Primary and Primary levels. At the same time, the number of States that have moderate development are equal under Primary & Upper Primary education level. In terms of EDI, the less developed States are similar in senior secondary and primary levels, and they are identical in secondary and upper primary levels. It shows a huge difference in the different dimensions of education development in the various States. Some states are highly developed in providing education with adequate resources and have great outcomes, and some states lag.
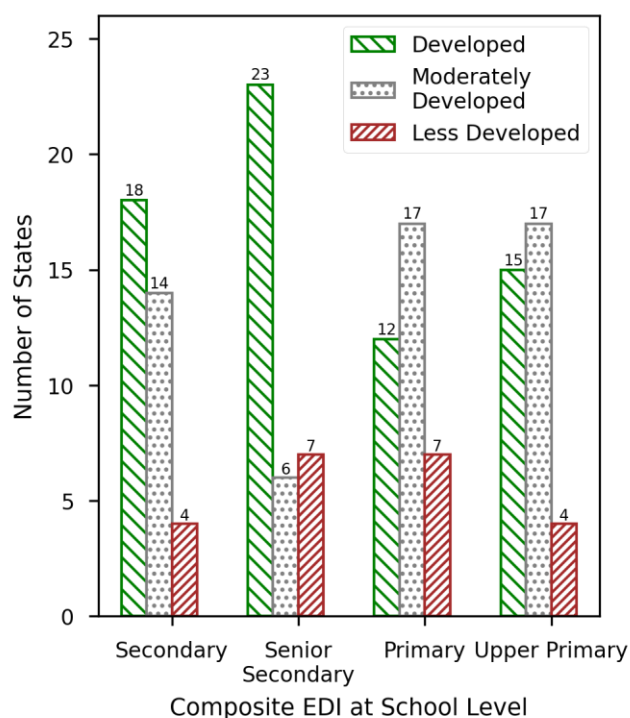

Fig: 7 Numbers of States at School Education

8   Suggestions and Conclusion

Education development is an important issue for the citizens and Government of every country. Hence, in this study, an attempt is made to scrutinize the development of education in the States of India, and a composite index is computed for the year 2016-17. Categorization of states as developed, moderately developed, and less developed has also been done so that suggestions can be made to improve further those states that fall under the moderate or less developed category. The study reveals that most States fall in the less developed category at the primary education level due to lack of access facilities. While in upper primary, a large number of the States are in the moderately developed category. The situation at the secondary and senior secondary level is quite better than the elementary education. As per school EDI, Delhi, Punjab, Puducherry, and Tamil Nadu States have the highest ranks and are considered the developed States. At the same time, the States such as Sikkim, Bihar, Andaman & Nicobar and Arunachal Pradesh have obtained the lowest level and are considered as less developed States. Thus, it reveals that there are many differences in the states in providing better education. Therefore, the Government needs to plan for improvement in the education system and implement the same with immediate effect. Primary and upper primary education levels need more focus as many states lag in these two levels.

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