ORIGINAL RESEARCH PAPER

Volume-7 | Issue-4 | April-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

EDUCATION DEVELOPMENT INDEX IN INDIAN STATES

Economics

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KEYWORDS

Introduction:

For overall development of any nation education is very important. Education is one of the crucial indicators of human development. To measure human development index among other two dimensions (Standard of living and long and healthy life) knowledge has a significant role. Hence, in India central and state governments have spent huge amount of money on education sector, through various policies and programmes. Government spending on education can broadly be divided into different sections namely, primary, secondary, higher secondary, higher and profession education and so on. Not only spending is important, but also desired output from these spending is very important. In this context, measurement of performance of different regions on different educational indicators/dimensions becomes very important. There are number of studies on measurement of different educational dimensions in Indian context. Educational development cannot be measured through a single indicator. So scholars, construct indices. Numerousindices can be found in the recent years among them, education infrastructure index, education status index, accessibility index, education development index and so on. Hanagodimath (2008) has constructed education infrastructure index (EII) and education status index (ESI) for major Indian states for years 1980, 1990 and 2000. Yadav and Srivastava (2005) developed education development index for 16 major Indian states for the year 1993-94. National University of Education Planning and Administration (NEUPA) has constructed education development index (EDI) in the recent year, which has been considered as one of the best index. Given this background in the present study, using the data from EDI of NEUPA, an attempt has been made to analyse the status of various states in different indices and to trace the link among and between different indices namely Access index, Infrastructure index, Teacher index, Outcome index. Methodology has been presented in the following paragraphs.

Methodology of Education Development Index:

After getting the data from DISE, NEUPA has cleans it. After cleaning each indicator are normalized by using the following formula:

$$1 - \left\{\frac{Best\ Value - Observed\ Value}{Best\ Value - Worst\ Value}\right\}$$

Then for normalized values, Principal Component Analysis (PCA) is applied to decide the factor loading and weights. In case of a few variables, policy options are explored to identify the best values instead of based on the observed values (best value, zero), percentage of teachers without professional qualification (best value, zero) etc (http://schoolreportcards.in/Media/m188.html).

Table 1: List of Indicators of EDI and its Components

Component	Indicator
Access	Density of Schools per 10 Sq. Km
	Availability of schools per 1000 child population
	Ratio of primary to Upper Primary Schools/Sections
Infrastructure	Percentage of Schools with Student-Classroom Ratio: Primary >30 and Upper-Primary > 35
	Percentage of Schools with 1:1 Classroom-Teacher Ratio
	Percentage of Schools with Drinking Water facility
	Percentage of Schools with Boys Toilet
	Percentage of Schools without Girls Toilets
	Percentage of Schools Required and have Ramp
	Percentage of Schools with Kitchen-Shed (Government & Aided Schools)
Teacher	Percentage of schools with female teachers (in schools with 2 and more teachers)
	Percentage of Schools with Pupil-Teacher Ratio: Primary >30 & Upper Primary > 35
	Percentage of Single-Teacher Schools
	Teachers without Professional Qualification
Outcome	Average number of instructional days -Upper Primary
	Average number of Instructional days
	Average working hours for teachers
	Percentage of change in enrollment in Gov schools over the previous year
	Gross Enrollment Ratio
	Participation of SC children: Percentage of SC Population: Percentage of SC Enrollment
	Participation of ST children: Percentage of ST Population: Percentage of ST Enrollment
	Participation of Muslim children: Percentage of Muslim Population: Percentage of Muslim Enrollment
	Ratio of Girls Enrollment to Boys Enrollment
	Drop-out rate
	Transition Rate for primary to upper primary level

Source: http://schoolreportcards.in/Media/m188.html

Results of using the above mentioned methodology have been presented in the Table 2 for the year 2013-14. It is found that Puducherry, Lakshadweep, Sikkim, Himachal Pradesh, Karnataka and Delhi were found in the top position in the education development index of 'primary', 'upper primary' and 'composite primary and upper primary levels'; whereas, Uttar Pradesh, Bihar, Jharkhand, West Bengal, Madhya Pradesh and Assam were found in the bottom position out of 35 states in the country. Inter-state disparities have also been studies with the coefficient of variation (CV %), which has been presented in the last row of the table. It is found that between primary and upper primary level inter-state disparity is lower in primary (CV 13.62%) than the upper primary (CV 13.91%).

Table 2: State-wise Ranking on Composite Educational Development Index (Primary and Upper Primary) in India, 2013-14

State/UT	Primary Level		Upper Primary Level		Composite Primary & Upper Primary Level	
	Index	Rank	Index	Rank	Index	Rank
A & N Islands	0.659	12	0.678	12	0.668	12
Andhra Pradesh	0.564	23	0.643	19	0.603	19
Arunachal Pradesh	0.460	34	0.637	20	0.548	28
Assam	0.490	32	0.557	30	0.524	30
Bihar	0.444	35	0.538	31	0.491	34
Chandigarh	0.621	14	0.739	4	0.680	11
Chhattisgarh	0.575	21	0.567	29	0.571	26
D & N Haveli	0.565	22	0.647	18	0.606	18
Daman & Diu	0.608	16	0.675	14	0.642	15
Delhi	0.673	10	0.737	5	0.705	6
Goa	0.586	19	0.616	22	0.601	20
Gujarat	0.678	8	0.714	6	0.696	8
Haryana	0.616	15	0.676	13	0.646	14

Himachal Pradesh	0.719	3	0.709	10	0.714	4
Jammu & Kashmir	0.531	28	0.608	27	0.570	27
Jharkhand	0.502	31	0.507	32	0.505	33
Karnataka	0.705	5	0.714	7	0.710	5
Kerala	0.680	7	0.712	9	0.696	9
Lakshadweep	0.726	2	0.756	2	0.741	2
Madhya Pradesh	0.559	24	0.479	34	0.519	31
Maharashtra	0.634	13	0.666	16	0.650	13
Manipur	0.592	17	0.665	17	0.628	17
Meghalaya	0.468	33	0.615	25	0.541	29
Mizoram	0.527	29	0.667	15	0.597	22
Nagaland	0.558	25	0.615	24	0.586	24
Odisha	0.583	20	0.614	26	0.599	21
Puducherry	0.743	1	0.782	1	0.762	1
Punjab	0.674	9	0.712	8	0.693	10
Rajasthan	0.587	18	0.597	28	0.592	23
Sikkim	0.701	6	0.742	3	0.722	3
Tamil Nadu	0.712	4	0.690	11	0.701	7
Tripura	0.524	30	0.630	21	0.577	25
Uttar Pradesh	0.554	26	0.370	35	0.462	35
Uttarakhand	0.664	11	0.615	23	0.639	16
West Bengal	0.550	27	0.480	33	0.515	32

Source: NEUPA, EDI Report

Mere ranking of states will not give the meaningful picture of the performance of different states. Hence, these states have been grouped into four categories based on their index values.

On the basis of the index value, the states are categorised into four groups i.e. Group I – Best, Group II – Good, Group III – Below Average and Group IV – Worst. For this purpose all the states are first divided into two groups on the basis of state average index values, - one above the all-India average and the other below the all-India average. Then two more averages are worked out, one for the group of states whose values are above the all-India average and another for the group of states whose values are below the all-India average. The states whose values are above and below the former average are classified as Group I – Best and Group II – Good states respectively. The states whose values are above and below the latter average are classified as Group III – Below Average and Group IV – Worst states respectively. Information related to this has been presented in Table 3.

- Eight out of 35 states/union territories namely Puducherry, Lakshadweep, Himachal Pradesh, Tamil Nadu, Karnataka, Sikkim, Kerala, Gujarat, were found in the best category in EDI of primary level with the group average of EDI value 0.710
- Similarly, same number of (eight) states viz., Jammu & Kashmir, Mizoram, Tripura, Jharkhand, Assam, Meghalaya, Arunachal Pradesh and Bihar were observed in the worst group in EDI of upper primary level with group average of EDI value of only 0.490
- With respect of upper primary level also more or less same status can be observed.
- Inter-state imbalances is increasing from the group of best performing states to worst performing states in primary level EDI
- On the other hand in upper primary level no trend is observed in different groups of states in EDI value.

Table 3: Grouping of States and union territories in Educational Development Index of Primary and Upper Primary levels in India (2013-14)

	Best	Good	Below Average	Worst
EDI of Primary Level	Puducherry, Lakshadweep, Himachal Pradesh, Tamil Nadu, Karnataka, Sikkim, Kerala, Gujarat, **(Group Average 0.71) CV-3.13%**	Punjab, Delhi, Uttarakhand, A & N Islands, Maharashtra, Chandigarh, Haryana, Daman & Diu, **(Group Average 0.64) CV-4.18%**	Manipur, Rajasthan, Goa, Odisha, Chhattisgarh, D & N Haveli, Andhra Pradesh, Madhya Pradesh, Nagaland, Uttar Pradesh, West Bengal, **(Group Average 0.57) CV-2.6%**	Jammu & Kashmir, Mizoram, Tripura, Jharkhand, Assam, Meghalaya, Arunachal Pradesh, Bihar, **(Group Average 0.49) CV-6.75%**
EDI of Upper Primary Level	Puducherry, Lakshadweep, Sikkim, Chandigarh, Delhi, Karnataka, Gujarat, **(Group Average 0.74) CV-3.21%**	Kerala, Punjab, Himachal Pradesh, Tamil Nadu, A & N Islands, Haryana, Daman & Diu, Mizoram, **(Group Average) 0.69CV-2.7%**	Maharashtra, Manipur, D & N Haveli, Andhra Pradesh, Arunachal Pradesh, Tripura, Goa, Uttarakhand, Nagaland, Meghalaya, Odisha, Jammu & Kashmir, Rajasthan, **(Group Average 0.63) CV-3.47%**	Chhattisgarh, Assam, Bihar, Jharkhand, West Bengal, **(Group Average 0.5) CV-13.42%**

Further, another exercise has also been done to see the association among and between different indices. It is found that,

- In upper primary level all the indices namely Access Index, Infrastructure Index, Teachers Index and Outcome Index are positively associated and statistically significant to each other, which can be seen through the correlation coefficient in Table 4 and Figure 5 to 6. The highest statistical significance is found between output and teacher indices. It means teachers play an important role for the educational development.
- With respect to primary level, except 'teacher-infrastructure' and 'teacher-output' none of the indices are correlated significantly (Figure 3 to 4).

Table 4: Correlation coefficients among and between different indices of Primary Level

	Access Index	Infrastructure Index	Teachers Index	Outcome Index	EDI
Access Index	1				
Infrastructure Index	-.167	1			
Teachers Index	-.031	.742**	1		
Outcome Index	.141	.307	.674**	1	
EDI	.008	.878**	.954**	.667**	1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Source: calculated from appendix Tables from 3.8 to 3.11

Table 5: Correlation coefficients among and between different indices of Upper Primary Level

	Access Index	Infrastructure Index	Teachers Index	Outcome Index	EDI
Access Index	1				
Infrastructure Index	.585**	1			
Teachers Index	.470*	.542*	1		
Outcome Index	.447*	.493*	.525*	1	
EDI	.723**	.846**	.831**	.764**	1

Source: calculated from appendix Tables from 3.8 to 3.11

Figure 1: Output index is positively associated with Access index at primary level, but not statistically significant

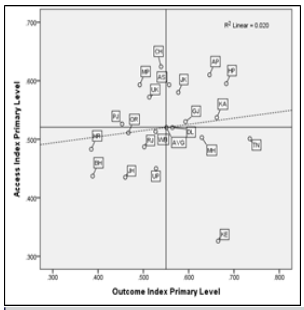


Figure 2: Output index is positively associated with Infrastructure index at primary level with statistically significant

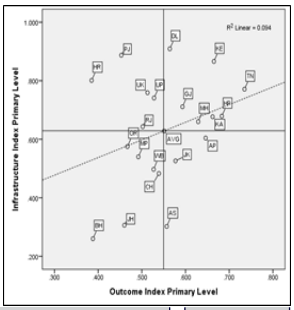


Figure 3: Output index is positively associated with Teacher index at primary level with statistically significant strongly

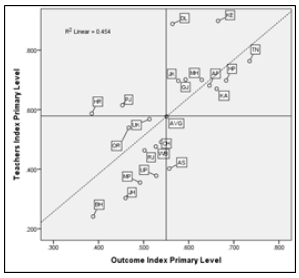


Figure 4: Output index is positively associated with Access index at primary level with statistically significant

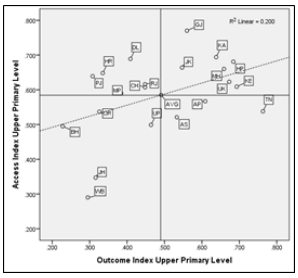


Figure 5: Output index is positively associated with Infrastructure index at upper primary level with statistically significant

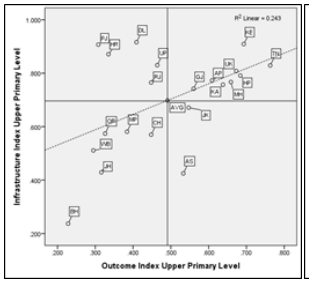
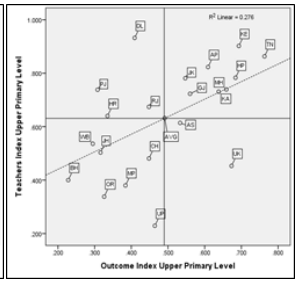


Figure 6: Output index is positively associated with Teacher index at upper primary level with statistically significant



Conclusion:

Observing at the association among and between different indices it is found that with respect to primary level, except 'teacher index-infrastructure index' and 'teacher index-output index' none of the indices are correlated significantly, but they have expected signs. In upper primary level, all the indices namely Access Index, Infrastructure Index, Teachers Index and Outcome Index are positively associated and statistically significant to each other. The highest statistical significance is found between output and teacher indices. It means teachers play an important role for the educational development in upper primary level. Totally, for primary level infrastructure has major role and in upper primary level teacher has major role in higher outcome educational outcome.

Public expenditure on education is too low in India as compared with many countries in per capita terms as well as per cent to GDP. This makes a case for increase in such expenditure. Not only increasing of public expenditure is important but also proper utilization is more important. At present with respect to expenditure on education, most of the share of spending is on salary expenses. Along with salary expenses, good amount of school infrastructures should be developed. Infrastructure should be not only in the form of buildings but also good play grounds, good amount of equipments and tools on teaching and learning. Along with play grounds, students should be encouraged to participate in different games. This work should be initiated from the primary schools at village level. At least one government sports federation at taluk/block level should be developed with almost all the tools and techniques of sports. Every student should participate in at least in 2-3 games.

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