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Empirical Study for School Enrollment and Other Variables for North India

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Abstract:

Educational attainment of any country is directly proportional to its growth. In India government has implement several social- welfare scheme to uplift the education of the people and hence provide them skilled employment. The present demographic dividend needs to taken benefit of if the country wants to become a major economic power. The present paper evaluates the educational attainment of all the states of North India with the help of several parameters like percentage schools with girls toilets, schools with drinking water facility, mid day meal schemes in schools etc. Graphical analysis and correlation-regression analysis is done through SPSS software.

Keywords: North India, School education, mid day meal scheme, J&K, Uttrakhand, Punjab, Haryana, Delhi, Chandigarh, Himachal Pradesh

1. Introduction and Framework of Study

1.1. Background

Any country progresses with the development of its human resource. India being no exception to this basic principle is also looking forward to reap benefits of its demographic dividend. Quality human resource development is possible by providing them a strong base of which basic elementary education is the most significant component. In 1948, education was declared a basic human right for every person, and enshrined in the UNIVERSAL DECLARATION ON HUMAN RIGHTS. Since then it has been reaffirmed in the International Covenant on Economic, Social and Cultural Rights (1966), the Conventional on the Elimination of discrimination Against Women (1979) and the Convention on the Rights of the Child (1989), among many other human rights instruments. India adopted the WORLD DECLARATION ON EDUCATION FOR ALL in Jomtein (1990) and Dakar (2000), a movement launched by UNESCO, UNDP, UNICEF and the World Bank. Dakar (2000) having set six goals that run to 2015. Commitment towards the right to education was also reflected in the UN MILLENNIUM DEVELOPMENT GOALS set in 2000 with a deadline for achievement by 2015. There are eight Millennium Development Goals (MDGs), of which two focus on education

At the time of independence, India inherited a system of education which was not only quantitatively small but also characterised by structural imbalances. Only fourteen percent of the population was literate. The low levels of participation and literacy were aggravated by acute regional and gender disparities. Education is the core component of the development process, hence UNIVERSAL ELEMENTARY EDUCATION for all children in age group of 6-14 was recognised as a crucial input for nation building and was given due consideration in the Constitution as well as in successive Five Year Plans. Sarva Shiksha Abhiyan (SSA) is Government of India's flagship programme for achievement of Universalisation of Elementary Education (UEE) in a time bound manner, as mandated by 86th amendment of the Constitution of India making free and compulsory education to the children of 6-14 years of age group, a Fundamental Right.

The Directive Principles of State Policy envisage that the state shall endeavour to provide free and compulsory education for children up to the age of 14 years of age with a period of 10 years. The National Education Policies so far have reiterated the Constitutional Directive. The National Policy on Education 1986 (amended in 1992) resolves to provide free and compulsory education of satisfactory quality to all children up to 14 years of age before the commencement of the twenty first century. Unfortunately, we are still struggling to achieve this goal today.

Apart from the commitment given in National Policy on Education 1986 (amended 1992), several programmes and projects have been launched in several states of which District Primary Education Programme (DPEP) covers more than one state. DPEP was initiated with 42 districts in 7 states in 1994-95, a unique and innovative effort towards achieving the objectives of Universal Primary Education (UPE) in educationally backward districts in India. It considers that what is to be done at the district level need to be decided by those at the district level itself. It is envisaged as a centrally sponsored schemes with flexible parameters (Department of Education 1994), hence not an effort to develop uniform plans.

At the inception stage, it was realised that DPEP with a focus on decentralised planning, requires school level information, which is authentic, updated and readily available. The Ministry Of Human Resource Development (MHRD) as a part of DPEP national endeavour decided to design and develop a school based computerised information system. The responsibility for developing this system was given to the NATIONAL INSTITUTE OF EDUCATIONAL PLANNING AND ADMINISTRATION (NIEPA), New Delhi. Hence, a school-based statistical system was initiated by NIEPA during 1995 with the financial assistance from UNICEF, named DISTRICT INFORMATION SYSTEM FOR EDUCATION (DISE). In reference with the essence of DPEP, the district was selected as the core source of collection, computerisation, analysis and use of school level data. Later it got extended to state and national level, whereby the state level EMIS cells coordinate with district level work. DISE software was redesigned to meet the needs of Sarva Shiksha Abhiyan (SSA) programme.

This study derives its statistical information from DISE website, whereby state-wise report cards make information readily available. Officially north India includes 1) Jammu and Kashmir; 2) Uttrakhand; 3) Himachal Pradesh; 4) Haryana; 5) Punjab; 6) Delhi (capital of India) and 7) Chandigarh (Union Territory and capital of Haryana and Punjab). Various variables have been correlated with the school enrollment of primary and upper primary classes for the years 2002-03 to 2013-14. Comparison within the north-Indian states is done through graphs and tables.

1.2. About the States

1.2.1. Jammu and Kashmir

Jammu and Kashmir is located in Himalayan Mountains, and shares a border with the states of Himachal Pradesh and Punjab. Srinagar is the summer capital and Jammu is the winter capital. Overall literacy rate is 68.7%, male literacy being 78.3% and female literacy 58%. Total districts in the state are 22 with a decadal growth rate of 23.7. Sex ratio in the state is 883 females per thousand males. Article 370 of the Indian Constitution is a law that grants special autonomous status to Jammu and Kashmir.

1.2.2. Uttrakhand

The state was established on 9th November 2000, separated from Uttar Pradesh as Uttaranchal. On 1st January 2007 it was renamed as Uttrakhand. Dehradun is the capital city of the state. The Human Development Index value (HDI) is 0.515, being medium and 7th ranked state. Overall Literacy rate is 79.3% with male and female literacy rate being 88.3 and 70.7 respectively. Total number of districts in the state are 13 and decadal growth rate of 19.2. Sex ratio is 963 females per thousand males.

1.2.3. Himachal Pradesh

Being established on 25th January 1971, Himachal holds HDI rank 3 with a medium 0.652 value. Shimla is the capital city. The overall literacy rate is 83.8% whereby the male and female literacy rates are 90.8% and 76.6% respectively. With a total of 12 districts, the decadal growth rate is 12.8 and 974 being the sex ratio.

1.2.4. Haryana

Haryana was established on 1st November 1966 as a newly created state carved out of the Indian Punjab (east Punjab) state on the basis of language. The capital city of Haryana is Chandigarh. The overall literacy rate is 76.6 with male and female being 85.4 and 66.8 respectively. With total number of districts being 21, the state has a decadal growth rate of 19.9 and sex ratio of 877.

1.2.5. Punjab

The state was established on 15 August 1947 and was reorganised on 1 November 1966. The overall literacy of the state was 76.6 with male and female being 81.5 and 71.3 respectively. A total number of districts being 22 and Chandigarh the capital city of the state, the decadal growth rate and sex ratios are 13.7 and 893 respectively.

1.2.6. Delhi

Delhi, officially the National Capital Territory of Delhi, was established on 1st February 1992. The overall literacy rate is 86.3 with male and female being 91 and 80.9 respectively. Total of 9 districts and decadal growth rate is 21. The number of female per thousand males is 866.

1.2.7. Chandigarh

Also known as THE CITY BEAUTIFUL, is a city and a union territory in the northern part of India that serves as the capital of the states of Haryana and Punjab. As a union territory, the city is ruled directly by the Union Government of India and is not part of either state. The overall literacy rate is 86.4 with male and female literacy rates being 90.5 and 81.4 respectively. A decadal growth rate of 17.1, the state has a sex ratio of 818.

1.3. Right to Education

The Constitution (Eighty-sixth Amendment) Act, 2002 inserted Article 21-A in the Constitution of India to provide free and compulsory education of all children in the age group of six to fourteen years as a Fundamental Right in such a manner as the State may, by law, determine. The Right of Children to Free and Compulsory Education (RTE) Act, 2009, which represents the

consequential legislation envisaged under Article 21-A, means that every child has a right to full time elementary education of satisfactory and equitable quality in a formal school which satisfies certain essential norms and standards.

Article 21-A and the RTE Act came into effect on 1 April 2010. The title of the RTE Act incorporates the words 'free and compulsory'. 'Free education' means that no child, other than a child who has been admitted by his or her parents to a school which is not supported by the appropriate Government, shall be liable to pay any kind of fee or charges or expenses which may prevent him or her from pursuing and completing elementary education. 'Compulsory education' casts an obligation on the appropriate Government and local authorities to provide and ensure admission, attendance and completion of elementary education by all children in the 6-14 age group. With this, India has moved forward to a rights based framework that casts a legal obligation on the Central and State Governments to implement this fundamental child right as enshrined in the Article 21A of the Constitution, in accordance with the provisions of the RTE Act.

The RTE Act provides for the:

1. Right of children to free and compulsory education till completion of elementary education in a neighbourhood school.
2. It clarifies that 'compulsory education' means obligation of the appropriate government to provide free elementary education and ensure compulsory admission, attendance and completion of elementary education to every child in the six to fourteen age group. 'Free' means that no child shall be liable to pay any kind of fee or charges or expenses which may prevent him or her from pursuing and completing elementary education.
3. It makes provisions for a non-admitted child to be admitted to an age appropriate class.
4. It specifies the duties and responsibilities of appropriate Governments, local authority and parents in providing free and compulsory education, and sharing of financial and other responsibilities between the Central and State Governments.
5. It lays down the norms and standards relating inter alia to Pupil Teacher Ratios (PTRs), buildings and infrastructure, school-working days, teacher-working hours.
6. It provides for rational deployment of teachers by ensuring that the specified pupil teacher ratio is maintained for each school, rather than just as an average for the State or District or Block, thus ensuring that there is no urban-rural imbalance in teacher postings. It also provides for prohibition of deployment of teachers for non-educational work, other than decennial census, elections to local authority, state legislatures and parliament, and disaster relief.
7. It provides for appointment of appropriately trained teachers, i.e. teachers with the requisite entry and academic qualifications.
8. It prohibits (a) physical punishment and mental harassment; (b) screening procedures for admission of children; (c) capitation fee; (d) private tuition by teachers and (e) running of schools without recognition,
9. It provides for development of curriculum in consonance with the values enshrined in the Constitution, and which would ensure the all-round development of the child, building on the child's knowledge, potentiality and talent and making the child free of fear, trauma and anxiety through a system of child friendly and child centred learning.

1.4. Concept of Mid-Day Meal Program

Government of India launched National Programme of Nutritional Support to Primary Education (Commonly known as Mid-Day Meal Scheme) on August 15, 1995 to provide mid-day meal to the children studying at primary level of education. In 2002, the Supreme Court directed the Government to provide cooked Mid- Day Meals (as opposed to providing dry rations) in all Government and Government aided primary schools. It was revised in September 2004 and in September 2006. MDMS is the world's largest school meal programme and reaches an estimated 11 crore children across 12 lakh schools in India. The scheme is implemented through the State/UT Governments. The central and state governments share the cost of the Midday Meal Scheme, with the centre providing 75 percent and the states 25 percent of the total fund allocated towards the scheme.

1.5. Objectives of Mid-Day Meal Scheme

Objectives of the Programme:- The main objectives of the programme are:

- i. To increase enrollment, retention and to tone up the learning abilities of the beneficiaries, especially of children belonging to poor and down trodden sections of the society;
- ii. To provide nutritious meal to the school going children to achieve the goal of healthy mind in healthy body;
- iii. To promote friendship and feelings of common brotherhood among the children belonging to different caste, colour and creed by providing meals to them together and also to increase their retention in schools

2. Review of Literature

Several state-wise studies have been conducted regarding the evaluation of Mid Day meal scheme since its inception. Some of the studies are Mid-Day-Meal Programme Annual Work Plan and Budget 2014-15 ; and Dr. Manju Gera & Ms. Jasjit Kaur (September 2014); Performance Evaluation of Cooked Mid-Day Meal (CMDM) (May 2010); Some Issues in School Education (Azim Premzi Foundation); NCERT Indian Educational Review; Mr. Gajpal Singh (May 2014); Zaidi (2005); Gangadharan (2006); Kanani and Gopaldas (2006) ; National Institute of Public Cooperation and Children Development, Karnataka (2005-06) ; CUTS (2007); Bisht (2007); Network for Social Accountability (NSA) (2008) ; Parida (2010) .

The present study enumerates the various factors responsible for the enrollment rate of mid day meal scheme in north India through correlation and regression analysis. Data analysis and the trends of various states have been analysed on a graphical format.

3. Objectives of the Study

The main objectives of the study are:

- i. To analyse the factors important for increasing or decreasing the School Enrollment Ratio north India. Special focus is on the percentage of schools providing Mid-Day Meal Scheme.
- ii. Find the correlation between the School Enrollment and various variables used in the study like Literacy Rate, Pupil Teacher Ratio, etc for each state separately.
- iii. R^2 is calculated for estimating how well the independent variables used in the study can explain the dependent variable for each state separately.

4. Data Sources and Methodology

DISE is developed to collect information from all recognized institutions imparting elementary education across the country. Recognized institutions include both government as well as private managed schools. Private managed schools include both private aided and private un-aided schools, and government managed schools include schools run by the Department of Education, Local Body, Social Welfare and Tribal Welfare Departments.

Unlike other surveys, DISE is complete enumeration of schools. We have derived information from the state-wise report cards available on the DISE website. The data is derived for primary (1-5 class) + Upper primary (6-8class) for the years 2002-03 to 2013-2014 for north India.

Broadly the following indicators which have been discussed in the present study:

- i. Literacy Rate
- ii. Pupil teacher Ratio
- iii. Schools providing mid day meal
- iv. Percentage schools with girls toilets
- v. Schools with drinking water facility
- vi. Student classroom ratio
- vii. Number of schools
- viii. Number of villages

The data was taken from DISE for north India for the years 2002-03 to 2013-14.

These variables were taken up as independent variables in the study and School Enrollment Ratio was taken as the dependent variable. Correlation between School enrollment ratio and each of the variables was calculated to estimate the relation between two variables and how strong is the relationship between them.

Besides this, regression analysis was done taking School Enrollment Ratio as the dependent variable and other variables as the independent variables.

The correlation and regression analysis has been done through SPSS statistics software.

5. Correlation Analysis

Variable	Correlation with School Enrollment Ratio						
	Haryana	Uttarakh and	J & K	Himachal Pradesh	Delhi	Chandigarh	Punjab
Literacy Rate	0.654	0.624	-0.282	-0.871	0.714	0.747	0.688
% schools with Girls Toilet	0.701	0.647	-0.234	-0.784	-0.058	0.483	0.553
Schools with drinking water facility	0.780	0.975	0.161	-0.530	0.783	-	0.817
Student-Classroom Ratio	-0.9	-0.798	0.168	0.662	-0.093	0.808	-0.944
Number of villages	-0.018	-0.687	0.139	0.527	0.940	0.895	0.262
Schools providing Mid-Day Meals	0.213	0.400	-0.539	0.915	-0.106	-0.230	-0.327
Pupil Teacher Ratio	-0.791	0.592	-0.012	0.839	0.273	0.776	-0.849
Number of schools	0.988	0.990	0.185	-0.736	0.975	0.740	0.988

Table 1

VARIABLE	LEVEL OF CORRELATION						
	HARYANA	UTTRA-KHAND	J&K	HIMACHAL PRADESH	DELHI	CHANDI-GARH	PUNJAB
Literacy Rate	High, +ve	High,+ve	Low, -ve	High, -ve	High, +ve	High, +ve	High, +ve
% Schools with Girls toilets	High, +ve	High, +ve	Low, -ve	High, -ve	Very Low, -ve	Low, +ve	Medium, +ve
% Schools with drinking water facility	High, +ve	Very high,+ve	Low, +ve	Medium, -ve	High, +ve	*****	High, +ve
Student- classroom Ratio	High, -ve	High, -ve	Low, +ve	High,+ve	Very low, -ve	High, +ve	Very high, -ve
Number of villages	Low, -ve	High, -ve	Low, +ve	Medium, +ve	Very high, +ve	High, +ve	Low, +ve
Schools providing Mid-Day Meals	Low, +ve	Low, +ve	Medium, -ve	Very high, +ve	Very low, -ve	Low, -ve	Low, -ve
Pupil-teacher Ratio	High, -ve	medium, +ve	Very low, -ve	High, +ve	Low, +ve	High, +ve	High, -ve
Number of schools	Very high, +ve	Very high,+ve	Low, +ve	High, -ve	Very high, +ve	High, +ve	Very high, +ve

Table 2

5.1. Literacy Rate

In correlation analysis, Jammu & Kashmir and Himachal Pradesh show startling revelations whereby the relation between school enrollment and literacy rate is negative. Meaning, higher the literacy rate, lower the school enrollment in the state. This might be due to the declining population in Himachal Pradesh over the years. The urban population in the state is declining and children in the age group of 0-6 years are also declining. The more educated are either migrating or resisting to give birth to many children and following judicious family planning.

Whereas Jammu & Kashmir has been experiencing terror threat and variable climatic disasters in the state. More literates (and economically well off families) have started migrating to more peaceful areas and have also started sending their children to hostels in other states.

Rest all states show a high positive correlation between literacy rate and school enrollment bringing forth an obvious picture in stable political, economic and geographical conditions that the more the people are literate, the more they realise its importance and encourage the coming generations to study.

Correlation values of states being Haryana 0.654; Uttarakhand 0.624; Delhi 0.714; Chandigarh 0.747 and Punjab 0.688. Low negative value of Jammu & Kashmir is -0.282 and high negative correlation of Himachal Pradesh is -0.871.

5.2. Percent Schools with Girls Toilets

Haryana and Uttarakhand show high positive correlation between the percent availability of girls toilets in schools with school enrollment ratio of students, implying that the higher the toilets available for girls, more will be the enrollment. Given this revelation, Swachha Bharat Abhiyan is such an initiative by the central government that would enhance the enrollment in schools.

Chandigarh shows low positive relation and Punjab shows medium positive relation, implying the availability of girl's toilets in schools has moderate effect on the school enrollment.

J&K and Delhi show low negative and very low negative correlation between school enrollment and percent availability of girl's toilets, implying this factor hardly affects the school enrollment here. Since the number of schools is increasing, they start functioning before the completion of infrastructure.

Himachal Pradesh shows a completely different scenario whereby the correlation is highly negative. Hence, we conclude that the demographic factors as birth-rate, death rate, immigration and emigration have resulted in such conclusions.

The correlation values of school enrollment with percent schools with girls toilets are Haryana 0.701; Uttarakhand 0.647; Chandigarh 0.483; Punjab 0.553. Whereas for Jammu & Kashmir it is -0.234; Himachal Pradesh -0.784 and Delhi -0.058.

5.3. Percent Schools with Drinking Water Facility

Haryana, Uttarakhand, Delhi and Punjab show high positive correlation of school enrollment with Percent schools with drinking water facility. Water being a basic necessity for survival is must in all schools. Jammu & Kashmir shows a low positive correlation value with school enrollment. Stating that Drinking water is a basic and crucial factor influencing school enrollment over the years.

Himachal Pradesh school enrollment shows a highly negative relation with drinking water facility, stating this is not a significant factor in the enrollment of students in schools. The state has its own peculiar demographic scenario that deviates the obvious results from others.

The Correlation values being Haryana 0.780; Uttarakhand 0.975; Delhi 0.783; Punjab 0.817 and Jammu & Kashmir 0.161. The negative correlation figure shown by Himachal Pradesh is -0.530, being moderately negative.

5.4. Student-Classroom Ratio

The better the infrastructure of the state, the more willing the parents will be to send their children to school. Hence, Haryana, Uttarakhand, Delhi, and Punjab show negative correlation with student-classroom ratio, implying that the lower the SCR the higher the school enrollment.

However, states like J&K, Himachal Pradesh and Chandigarh show positive correlation with different reasons behind the results. Chandigarh being a well developed UT has sufficient infrastructural facilities and hence excess of classrooms for the students are discouraged. The present scenario in the city is sufficient to accommodate students and provide quality education.

In Himachal Pradesh and Jammu & Kashmir, as stated previously have been showing declining trend in enrollment ratio due to various other factors (political, geographical and demographic) which are out of our area of this study.

The correlation values being Haryana -0.9; Uttarakhand -0.798; Delhi -0.093; and Punjab -0.944. The positive correlation values being J&K 0.168; Himachal Pradesh 0.662; and Chandigarh 0.808.

5.5. Number of Villages

Jammu & Kashmir, Himachal Pradesh, Delhi, Chandigarh and Punjab show positive correlation between school enrollment and Number of villages, implying that the more the number of villages the higher the school enrollment. Delhi and Chandigarh show a very high correlation of number of villages with school enrollment. The more the division of the jurisdiction of the area, the better it is for the states to administer the working by granting permissions on time and conducting regular audits to maintain quality of education imparted.

In Haryana and Uttarakhand, the number of villages is decreasing over time but the school enrollment is increasing, hence the negative correlation. In order to adopt a hassle free bureaucratic environment free from red-tapism, the jurisdiction of areas is rearranged. The fiscal deficit targets need to be achieved set under the FRBM Act, whereby more governance and lesser employees is the new approach followed in order to save the excess salary given for the work which required lesser people.

Positive correlation values being Jammu and Kashmir 0.139; Himachal Pradesh 0.527; Delhi 0.940; Chandigarh 0.895; and Punjab 0.262. The negative correlation figures of Haryana and Uttarakhand are -0.018 and -0.687 respectively.

5.6. Percent Schools Providing Mid-Day Meal Facility

Surprisingly, Haryana, Uttarakhand and Himachal Pradesh show a positive correlation with the Mid-Day Meal facility. The percent schools providing mid-day meal facility in 2012-13 and 2013-14 in Himachal Pradesh is zero. Hence the correlation value being 0.915. Thus, the mid-day meal scheme can be an influencing factor to the school enrollment over the years and hence funds should be given to the state.

Haryana and Uttarakhand show a low positive correlation value of 0.213 and 0.400 respectively. Hence more funds should be provided to the states in order to raise the school enrollment.

Jammu & Kashmir, Delhi, Chandigarh and Punjab show negative correlation values with the Mid-Day Meal scheme. Despite the enrollment ratio falling in Jammu and Kashmir, the state shows a rising trend in Percent schools with Mid-Day meal scheme. Hence the state is wasting its fund on the programme as it is not providing the intended results to it. Correlation value of J&K is -0.539.

Punjab show a rising trend in school enrollment but the Mid-Day meal scheme is hardly responsible for the rising enrollment as the funding for the scheme is decreasing and the percent schools are decreasing that provide Mid-day meal scheme but still school enrollment is rising. Correlation value of Punjab is -0.327.

Delhi and Chandigarh show schools providing Mid-Day meal facility in 100% schools for years 2010-11 and Chandigarh for another three years namely 2009-2010; 2012-13 and 2013-14. Hence the scheme is highly efficient in Delhi and Chandigarh. Correlation value of Delhi and Chandigarh are -0.106 and -0.230 respectively.

5.7. Pupil-Teacher Ratio

Haryana, Jammu & Kashmir and Punjab show negative correlation with pupil-teacher ratio, implying lower the PTR higher the school enrollment. Every child needs special attention and hence the recruitment of teachers has to be increased to decrease the pupil teacher ratio. In Jammu and Kashmir, school enrollment is falling and PTR is also moderately falling. The value of correlation for Jammu & Kashmir is -0.012.

Haryana and Punjab have correlation values of -0.791 and Punjab has -0.849, implying the states need to recruit more teachers to raise its school enrollment over the years.

Uttarakhand, Delhi and Chandigarh has correlation values of 0.592, 0.273 and 0.776 respectively, implying higher the PTR more will be the school enrollment over the years. This study might reveal that additional number of teachers required is comparatively less in these states than Haryana and Punjab.

Himachal Pradesh shows a correlation value of 0.839, being highly positive stating higher the PTR higher the school enrollment. Since the school enrollment is deteriorating over the years, the number of additional teachers required in the states is the least amongst all north-Indian states.

5.8. Number of Schools

Except Himachal Pradesh, all north-Indian states shows a positive (generally high, except J&K) correlation of the number of schools with school enrollment. As studied throughout that the school enrollment is deteriorating in Himachal Pradesh over the years, there is no valid point building new schools for children. Hence the correlation value of Himachal Pradesh is -0.736, being highly negative.

Jammu and Kashmir show a low positive correlation with Number of schools as the school enrollment is falling in the state since 2010-11 sharply. The value of correlation being 0.185.

Haryana, Uttrakhand , Delhi, Chandigarh and Punjab have correlation values of 0.988, 0.990, 0.975, 0.740 and 0.988 respectively. The more the number of schools , the better will be the quality education due to healthy competition and more access to schools in neighbourhood which would encourage the parents to send their children to study (avoiding transportation cost).

6. Regression Analysis

States	R-Square (R ²)
Punjab	1
Haryana	1
Uttarakhand	1
J&K	1
HP	1
Delhi	1
Chandigarh	1

Table 3

In regression, the R² coefficient of determination is a statistical measure of how well the regression line approximates the real data points. An R² of one indicates that the regression line perfectly fits the data. In simple words, R² determines how well independent variables taken in the study explain the independent variables. In our analysis R² is equal to one considering school enrollment as dependent variable and other different variables as independent, implying the independent variables are leading to correct estimation of school enrollment ratio. Hence, we don't need extra variables to explain the school enrollment ratio.

7. Data Analysis

7.1. % School Enrollment over the Years

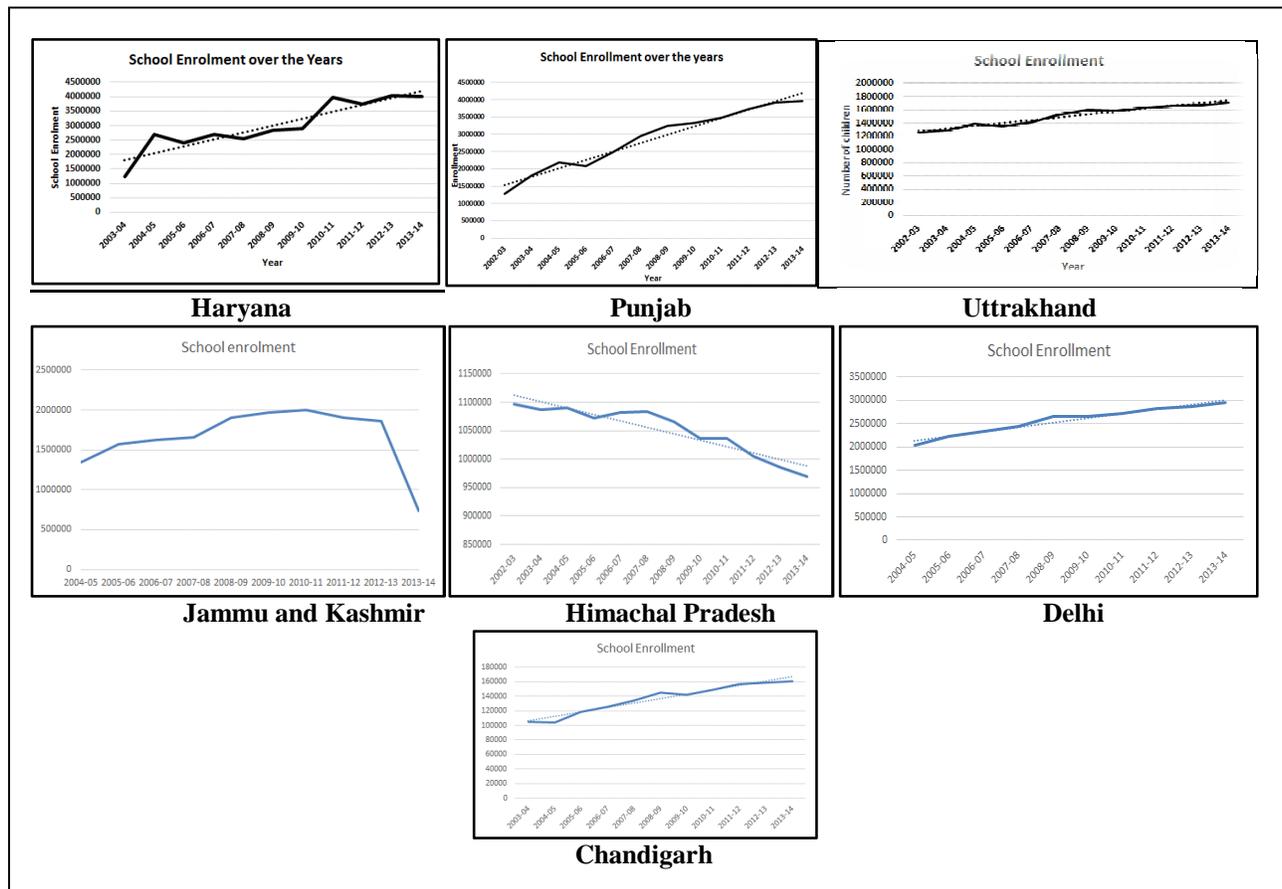


Figure 1

Trend in school enrollment has been increasing in all states except Himachal Pradesh and Jammu & Kashmir (J&K) where for J&K the lowest school enrollment is in the year 2013-14 being 740062 and highest in 2010-11 totalling to 1998138. Jammu & Kashmir has showed a sudden deterioration in the school enrollment during 2011-12 onwards. The sharp decline can be because of instability in political structure, rise of terrorism, religious taboos gaining more significance in the region etc.

Himachal Pradesh (HP) shows a gradual decline in school enrollment over the years the highest and lowest being 1096510 (2002-03) and 984898 (2012-13) respectively. The reason for the decline can be attributed to the declining population in the state as the %urban population falling from 9.8% (2001 census) to 8.7% (2011 census) and 0-6 Age group population declining from 13.05% (2001 census) to 11.1% (2011 census). HP government made primary education compulsory by promulgating the Himachal Pradesh Compulsory Primary Education Act, 1977 (ACT. No. 2 of 1988) with effect from 1998. Prior to it Primary education in the state was never made compulsory. It was rather persuasive. With this Act, every parent/guardian will have to send their children/wards to primary schools, failing which punitive action would be initiated against the defaulters. Despite this law and several other persuasive programmes to make primary education compulsory, the enrollment ratio is declining. The major factor responsible is as stated above, declining population as all other catalytic factors show a rising trend in Himachal.

Haryana, Punjab, Uttrakhand, Delhi and Chandigarh show a progressively rising trend in the school enrollment of primary and upper primary classes. Highest for Haryana, Punjab, Uttrakhand, Delhi and Chandigarh in 2013-14 being 3956723, 4011520, 1704890, 2944191 and 161185 respectively and lowest 1268940 (2002-03), 1243055 (2003-04), 1254075 (2002-03), 2046865 (2004-05) and 103867 (2004-05) respectively. Reasons attributable for the rise can be growing population, awareness of parents to educate their children, several government scholarships and subsidies, better economic condition of the families etc.

7.2. % Schools with Drinking Water Facility

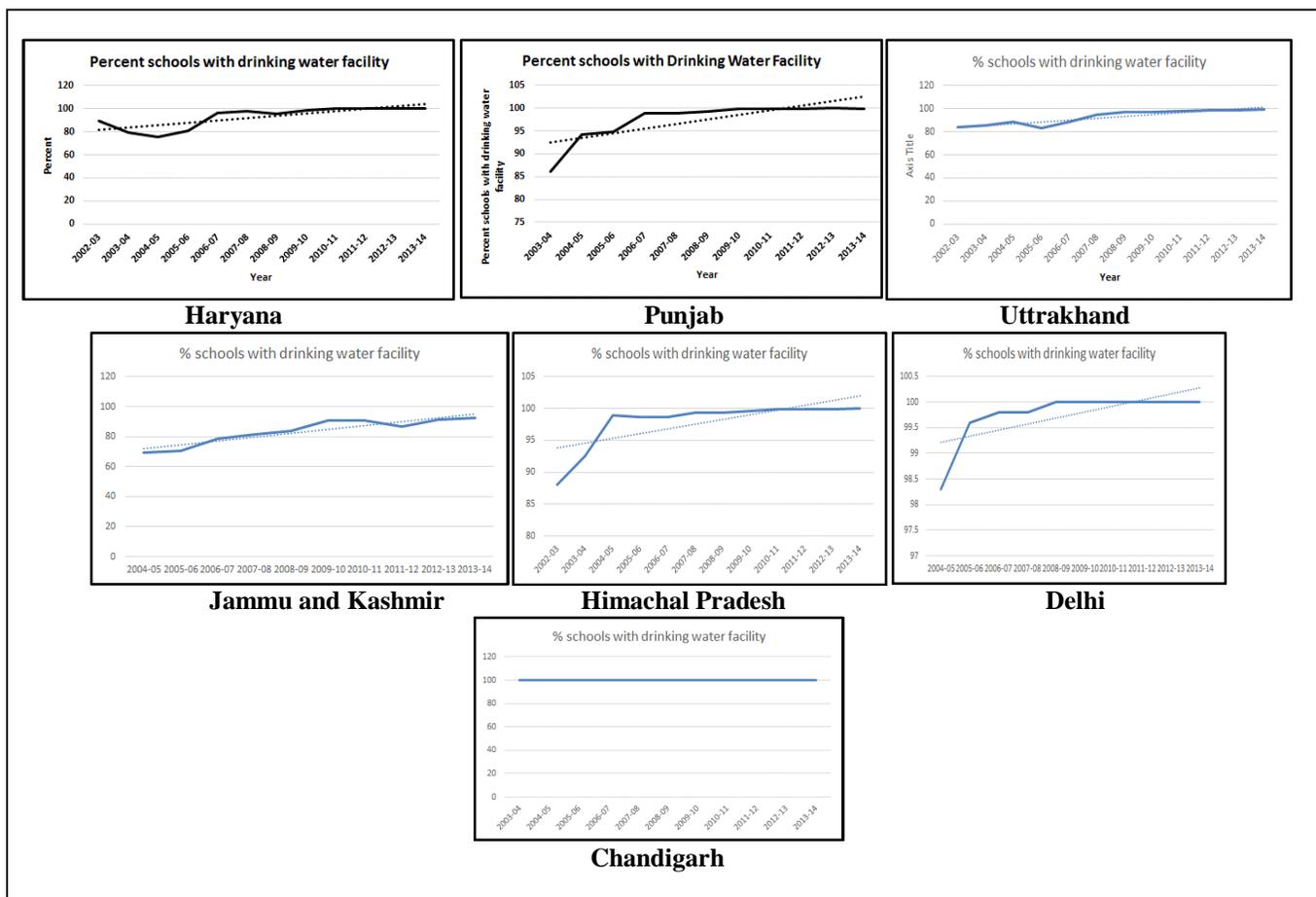


Figure 2

Water being a basic necessity of life was provided at reasonable rates to ensure effective education of students in schools. This factor received great attention from the authorities as percent schools with drinking water facility show a rising trend in all states. Chandigarh shows a remarkable record of 100% drinking water facility from year 2003-04 to 2013-14. Himachal Pradesh in 2013-14, Haryana in 2012-13 and 2013-14, and Delhi from 2008-09 to 2013-14 also show 100% drinking water facility. Jammu & Kashmir and Himachal Pradesh show highest drinking water facility in 2013-14, being 92.4% and 99.1% respectively.

The lowest percent of schools over the years of study are Jammu & Kashmir (2002-03) 69.5%, Himachal Pradesh (2002-03) 88.1%, Uttrakhand (2005-06) 83%, Haryana (2004-05) 75.5%, Punjab (2003-04) 86.1% and Delhi (2004-05) 98.3%.

Hence, every state has realised the importance of water facility and has tried to reach a 100% mark. Many have achieved this and only Jammu & Kashmir has to reach the record percentage. The state suffers from political disturbances and hence inefficiency in administration, resulting in not able to reach the 100% record high percentage.

7.3. % Schools with Girls Toilets

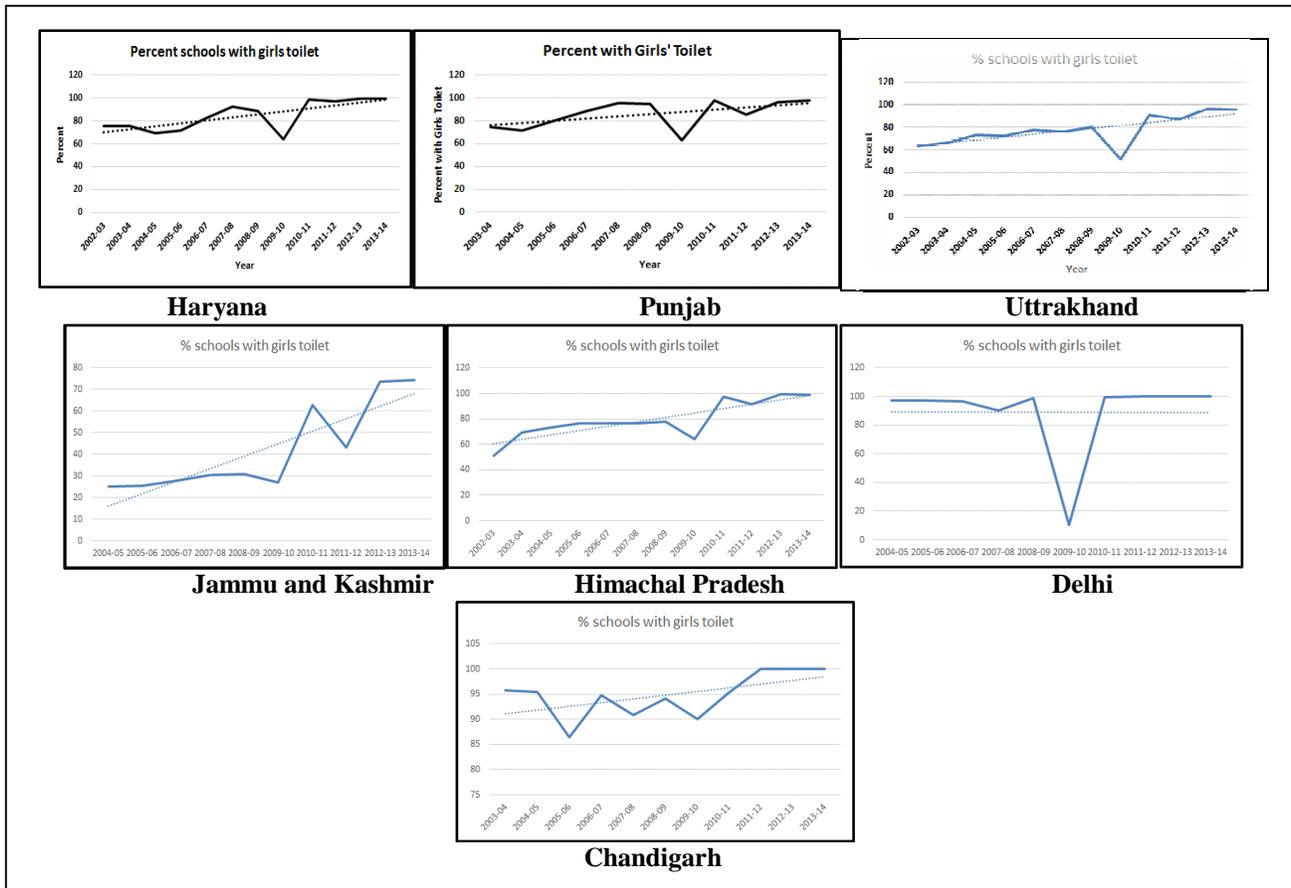


Figure 3

Hygiene and security plays a very important role when it comes to female child education. Parents resist sending their girl child to school because of fear of various societal maladies that they have to face. Availability of Girls' toilets is increasing over the years in school. Chandigarh and Delhi show a record high 100% schools with girls toilets from 2011-12 to 2013-14. The highest percentages are for Jammu & Kashmir (2013-14) 74.5%, Himachal Pradesh (2012-13) 99.3%, Uttarakhand (2012-13) 96.5%, Haryana (2013-14) 99.8% and Punjab (2010-11) 98.1%.

The Lowest percentages are for Jammu & Kashmir (2002-03) 24.9%, Himachal Pradesh (2002-03) 50.7%, Uttarakhand (2009-10) 51.3%, Haryana (2009-10) 64.3%, Punjab (2009-10) 62.9%, Chandigarh (2005-06) 86.4% and Delhi (2009-10) 10.5%.

Jammu & Kashmir needs to make more progressive efforts in order to provide better health facilities in the schools. This is the reason why amongst all north-Indian states, J&K has the maximum gender literacy gap. Other states should also achieve the 100% record mark as "A healthy child is a quality educated child".

7.4. Student-Classroom Ratio (SCR)

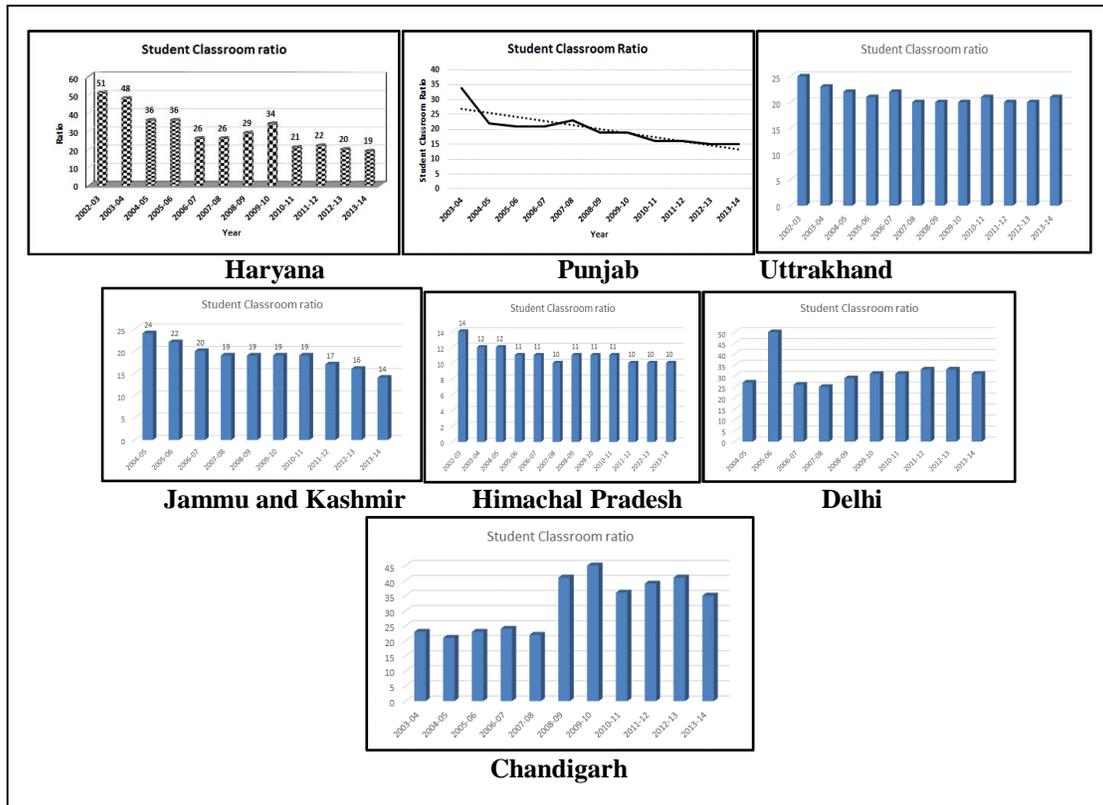


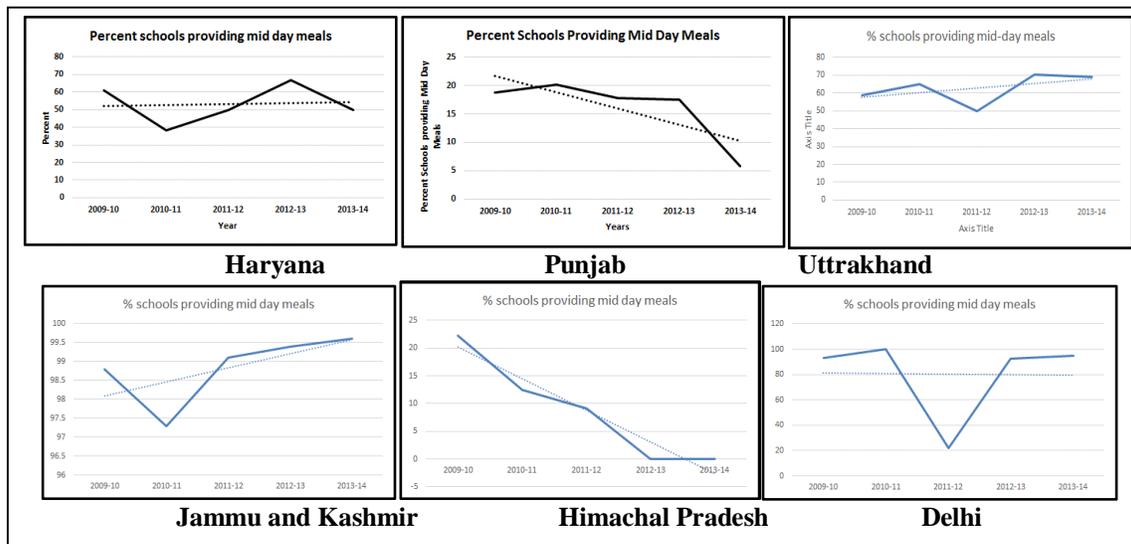
Figure 4

The declining trend of student classroom ratio shows that the number of classrooms in proportion the number of students is increasing. To accommodate the rising enrollment of students in schools, proper infrastructure is required. Parents will resist sending their children to school unless they are not provided with a decent classroom to sit and study. On the whole for all states the SCR shows a declining trend.

The best figures for Jammu & Kashmir (2013-14) 14; Himachal Pradesh (2007-8, 2011-12 to 2013-14) 10; Uttrakhand (2007-08 to 2012-13) 20; Haryana (2013-14) 19; Punjab (2012-13 to 2013-14) 15; Chandigarh (2004-05) 21; and Delhi (2007-08) 25.

The worst figures being Jammu & Kashmir (2004-05) 24; Himachal Pradesh (2002-03) 14; Uttrakhand (2002-03) 25; Haryana (2002-03) 51; Punjab (2003-04) 34; Chandigarh (2009-10) 45 and Delhi (2005-06) 50. The sudden increase in the ratio has been judiciously regulated in the subsequent years as in states like Haryana, Delhi and Chandigarh.

7.5. % Schools Providing Mid-Day Meal Programme



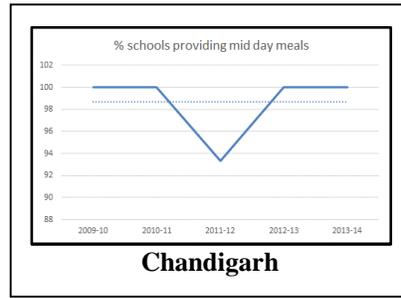


Figure 5

Another startling revelation of the study is the declining trend in schools with Mid Day Meal scheme in Punjab and Himachal Pradesh. Himachal Pradesh shows a zero figure in the programme for years 2012-13 and 2013-14. The scheme was initiated to incentivise the students to attend schools and upgrade their nutritional levels. Unfortunately, the scheme suffered from several loopholes as regards funding, target beneficiary, corrupt middlemen etc.

The highest percent schools with Mid –Day Meal are in Jammu & Kashmir (2013-14) 99.6; Himachal Pradesh (2009-10) 22.2%; Uttrakhand (2012-13) 70.5%; Haryana (2012-13) 66.7%; and Punjab (2010-11) 20.2. Chandigarh and Delhi show a record high of 100% for 2010-11. Chandigarh maintains 100% for years 2009-10; 2012-13; and 2013-14.

The lowest percentages of the states are Jammu & Kashmir (2010-11) 97.3%; Himachal Pradesh (2009-10) 22.2; Uttrakhand(2011-12) 50; Haryana (2010-11) 38.3; Punjab (2013-14) 5.8; Chandigarh (2011-12)93; and Delhi (2013-14) 95.

Being a centrally sponsored scheme, the 14th finance commission has reduced its funding from the centre even more. Future course of action of NITI AAYOG would only enable us to comment about the scheme’s future.

7.6. Pupil-Teacher Ratio

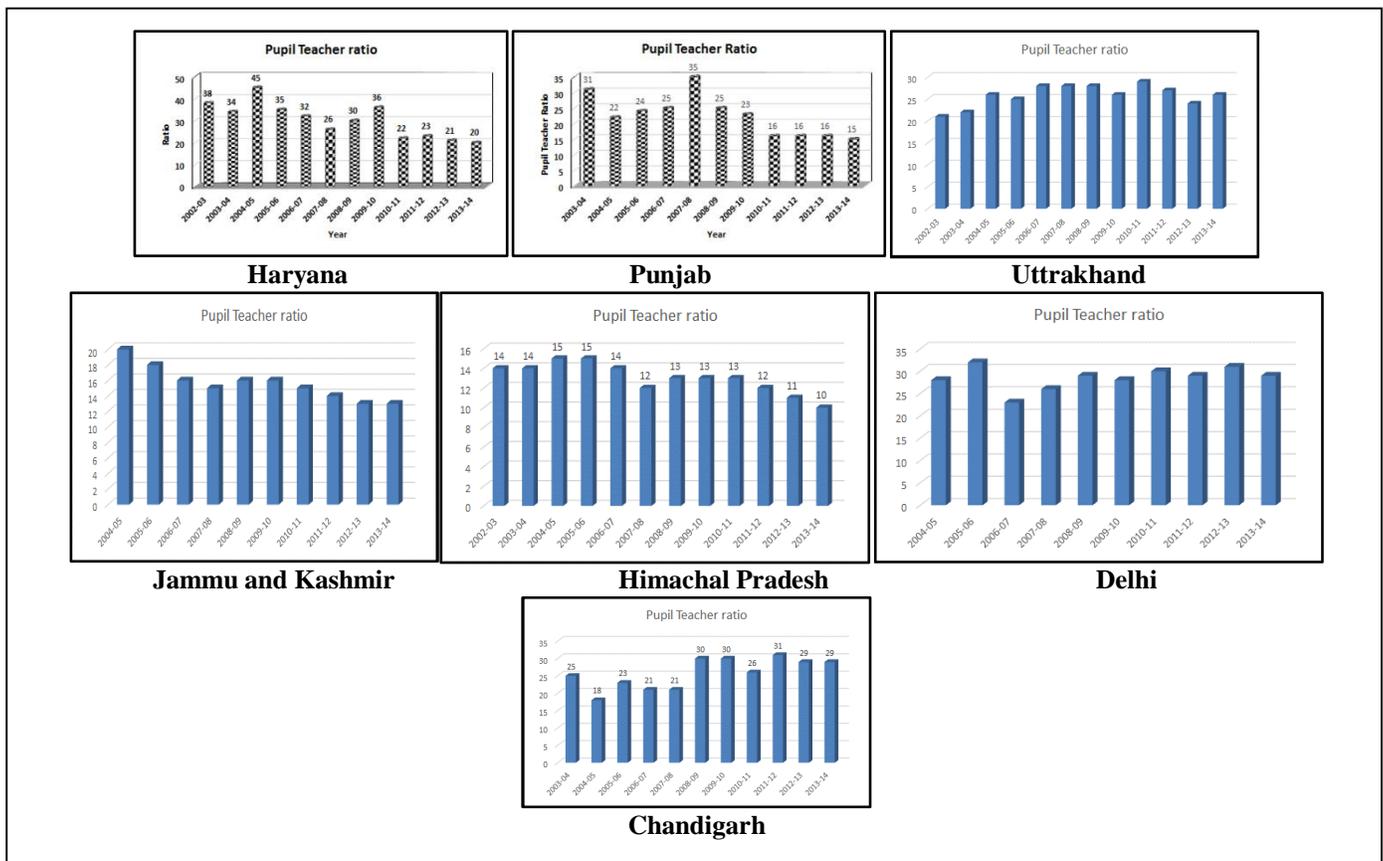


Figure 6

The pupil teacher ratio shows a declining trend which implies the recruitment of teachers is increasing. Teachers are able to concentrate on each student and give effective results. Teacher plays an important part in the development of the child, theoretically as well as psychologically. Every child is different and needs to be motivated by variable approaches.

The best figures evaluated are Jammu & Kashmir (2012-13 and 2013-14) 13; Himachal Pradesh (2013-14) 10; Uttrakhand (2002-03) 21; Haryana (2013-14) 20; Punjab (2013-14) 15; Chandigarh (2004-05) 18; and Delhi (2006-07) 23.

The worst figures being Jammu and Kashmir (2004-05) 20; Himachal Pradesh (2004-05 and 2005-06) 15; Uttrakhand (2010-11) 29; Haryana (2004-05) 45; Punjab (2007-08) 35; Chandigarh (2011-12) 31; and Delhi (2012-13) 31.

8. Policy Suggestions

Education in the Indian Constitution is a concurrent issue and both centre and states can legislate on the issue. States generally bemoan over the insufficiency of funds from the centre. The 14th Finance commission (2015-20) has raised the share of states in the divisible pool of taxes from 32% to 42%. However, the share of centrally sponsored schemes has been reduced. Mid-Day Meal programme is a centrally sponsored scheme; hence its future course will be decided by the ongoing meetings of the sub-groups of NITI AAYOG among various states.

Analysis of the data states that following factors have most significant relation with the school enrollment:-

VARIABLE	HIGH POSITIVE	HIGH NEGATIVE
Literacy Rate	1.Haryana; 2)Uttrakhand; 3)Delhi; 4)Chandigarh; 5)Punjab	1)Himachal Pradesh
% schools with girls toilets	1)Haryana; 2) Uttrakhand	1) Himachal Pradesh
% schools with drinking water facility	1)Haryana; 2) Uttrakhand; 3)Delhi; 4) Punjab	
SCR	1)Himachal Pradesh; 2)Chandigarh	1)Haryana; 2)Uttrakhand; 3) Punjab
Number of villages	1)Delhi; 2)Chandigarh	1)Uttrakhand
% schools providing MDM	1)Himachal Pradesh	
PTR	1) Himachal Pradesh	1)Haryana; 2) Punjab
Number of schools	1)Haryana; 2)Uttrakhand; 3) Delhi; 4)Chandigarh; 5)Punjab	1)Himachal Pradesh

Table 4

8.1. Literacy Rate and Number of Schools

Surprisingly, Himachal Pradesh shows high negative correlation for literacy rate with its school enrollment. The overall literacy rate in the state has increased from 76.5% to 83.8% while the school enrollment has been deteriorating. The possible reason is the decreasing population in the state in 0-6 age group and urban population. The decadal growth rate has declined from 17.5 to 12.8.

The more literates you have in your vicinity, the more is the school enrollment as you realise the value of education.

8.2. Percent Schools with Girls Toilets

Haryana and Uttrakhand show a high positive correlation with this variable and hence should be focussed more. Swachh Bharat Abhiyaan should be given more focus in these two states of north India and discourage open defecation. Parents would be more willing to send their girls to schools. Manual scavenging should also be discouraged as an objective of Swachh Bharat Abhiyan. More girls toilets have been built in Himachal Pradesh over the years but has no significant effect on the school enrollment due to the already mentioned demographic changes in this state.

8.3. Percent Schools with Drinking Water Facility

Haryana, Uttrakhand, Delhi and Punjab have high positive correlation with this variable. Hence to raise the school enrollment in these states, drinking water should be paid great emphasis.

8.4. Student –Classroom Ratio

Himachal Pradesh and Chandigarh show high positive correlation with this variable. Chandigarh being a developed city does not need focus on infrastructural facilities and Himachal Pradesh shows a deteriorating population in the 0-6 age group, requiring lesser classrooms in future for students to enrol themselves.

Haryana, Uttrakhand and Punjab show high negative correlation, implying lower SCR higher will be the school enrollment. Hence more classroom need to be constructed to raise the school enrollment in these states.

8.5. Number of Villages

Delhi and Chandigarh show high positive correlation, hence the more the villages and division of jurisdiction, the better is for the school enrollment to grow.

Uttrakhand show a high negative correlation with number of villages, hence the division of jurisdiction is highly not recommended for Uttrakhand.

8.6. Percent Schools Providing MDM

Himachal Pradesh show a high positive correlation with mid day meal scheme. However, in 2012-13 and 2013-14 the mid day meal facility was zero in Himachal schools, school enrollment further deteriorating over the years. Hence only in Himachal Pradesh Midday meal scheme can be proved to be highly productive and hence recommended to raise funds.

Rest all other states show poor results to the objectives of Mid-Day Meal scheme.

8.7. Pupil-Teacher Ratio

Himachal Pradesh shows a high positive correlation with this factor. Since due to the deteriorating population over the years and lesser students enrolling in schools, the number of teachers required is least in Himachal Pradesh in north India.

Haryana and Punjab show high negative correlation, implying lower the PTR, higher will be school enrollment. Hence efforts should be made to raise recruitment of teachers in these two states.

9. Conclusion

The factors having a high effect on the school enrollment should be scrutinised properly and steps should be taken to increase the school enrollment at an even faster pace. Focus on the structural reforms need special emphasis. Infrastructural and institutional reforms should be the prime concerns of the state.

More funding for developmental projects and better autonomy (with decentralisation) to be given to the ground level workers. Regulation of the structural reforms through an independent agency is also proposed to ensure transparency and accountability.

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