QUALITY OF ELEMENTARY EDUCATION IN INDIA:
AN INTER-STATE COMPARISON

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INTRODUCTION

Universal elementary education[1] is one of the most important catalysts for social and economic progress of a country. The development of a child into a responsible and empowered citizen is dependent on elementary education he or she receives. Quality elementary education expands the scope of an individual's development, especially in terms of acquisition of skills and employability; leading to enhancement of her/his efficiency and overall quality of life[2]. Further, elementary education is very important for our country because only a literate population can actively contribute to nation-building through critical thinking and reinforcement of democratic values.

Sarva Shiksha Abhiyan (SSA)[3] has been the main programme for universalizing elementary education in India. Its overall goals include universal access and retention, bridging of gender and social category gaps in education and enhancement of learning outcomes of children. On the other hand, the Right to Education (RTE) Act 2009 provides a justiciable legal framework that entitles all children between the ages of 6-14 years free and compulsory admission, attendance and completion of elementary education.

There has been a steady growth of elementary education in the country, especially in enrolment in schools. Data shows that the enrolment in Class VIII has almost doubled in the decade between 2004-05 and 2014-15, from 11 million to 22 million[4]. Enrolment for the age group

Figure 1.1: Growth of Enrolment in Elementary Education

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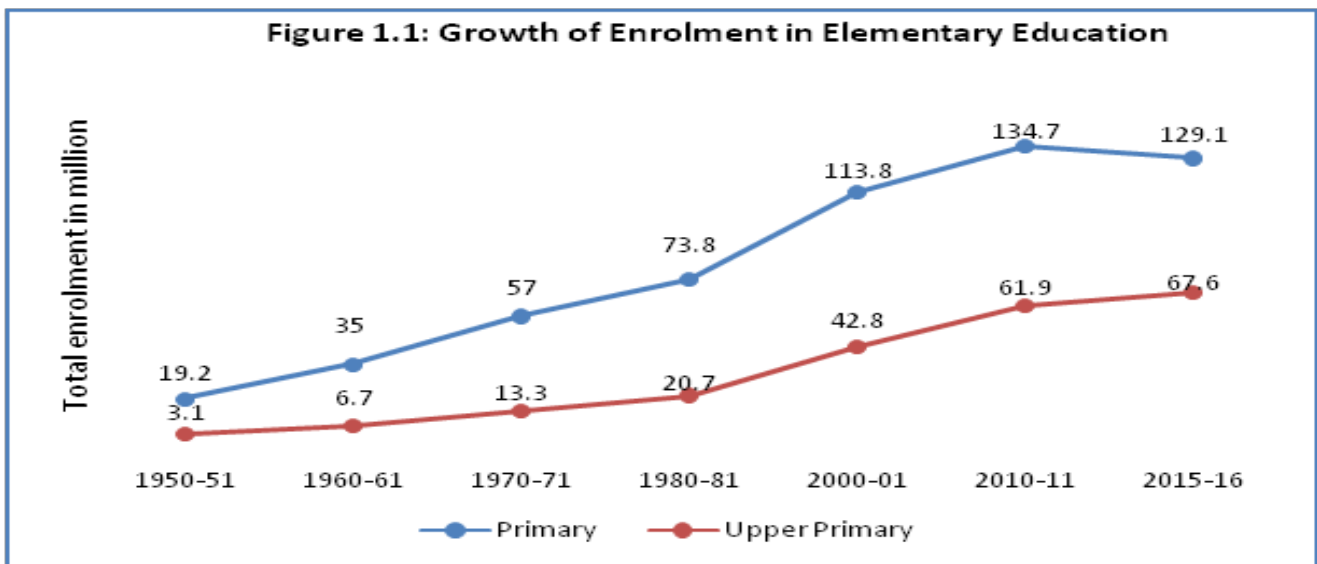
1 Elementary education in India covers the primary (6-11 years) and upper primary (11-14 years) age group. In most of the states, this translates into the successful completion of prescribed educational requirements till Class VIII. The essence of the goal is for every 14-year old to have acquired foundation skills – ability to read and write with fluency, numeracy, comprehension, analysis, reasoning and social skillssuch as teamwork.

2 The 11th FYP, 2007-2012, Planning Commission, Government of India

3 It has now been incorporated into a new programme called Samagra Shiksha since 2018

4 Annual Status of Education Report (Rural) 2017

6-14 has been 96% or above since 2009. This proportion increased from 96.7% in 2014 to 96.9% in 2016[5] Near universal enrolment and automatic promotion through elementary stage have resulted in more and more children successfully completing elementary schooling.

However, growth in enrolment/ near universalisation of elementary education is just one piece of the story. There are still many challenges facing elementary education and the foremost among them is the poor quality of education. The poor quality of education is reflected in the continuing low level of learning outcomes[6] and completion rates of primary school[7]. The fact is we are in a severe learning crisis with respect to the most basic skills: a large proportion of students currently in elementary school have not attained foundational literacy and numeracy, i.e., the ability to read and comprehend basic text and the ability to carry out basic addition and subtraction with Indian numerals[8].

Numerous studies show that, in the current educational system, once students fall behind on foundational literacy and numeracy, they tend to maintain flat learning curves for years, perpetually unable to catch up[9]. So many capable students have found themselves in this unfortunate black hole, unable to emerge. For many students, this has become a major reason for not attending school, or for dropping out altogether[10]. It is therefore imperative to address this learning crisis head on and immediately, so that basic learning can be accomplished in schools and students gain the opportunity to obtain an education of quality.

The present paper is divided into four sections. While section-1 covers introduction, section-2 is devoted to the data source and methodology. Section-3 analyses the results, section-4 talks about factors for poor learning outcomes, and section-4 gives recommendations and concludes the findings.

1.1   Rationale

i.   There have been quite a few studies on the quality of elementary education based on learning outcomes of children. But not enough research has been done using the latest data by Annual Survey of Education Report – Rural (ASER) by Pratham.

ii.   Using a time-series data for five years (2010, 2012, 2014, 2016, and 2018), the paper works on composite learning outcome indices of children, ranks states by such indices, and measures their average growth rates; thus, filling the knowledge gaps

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[5]   Annual Status of Education Report (Rural) 2016

[6]   Learning outcome is the best indicator of learning in terms of measurable skills, abilities and knowledge that learners demonstrates as a result of completing a given course or class.

[7]   Jenkins, R. and Barr, E. (2006), Social Exclusion of Scheduled Caste Children from Primary Education in India, UNICEF India, New Delhi

[8]   Draft National Education Policy 2019,Ministry of Human Resource Development, Government of India

[9]   ibid

[10] ibid

1.2 OBJECTIVES

a. To analyse quality of elementary education in terms of learning outcomes of children in different states of India post the implementation of the Right to Education Act in 2010, and

b. To investigate the possible factors which could influence learning outcomes of children at elementary level in rural India.

DATA SOURCE AND METHODOLOGY

2.1 DATA SOURCE

Data for the present paper has been culled out from Annual Status of Education Reports (Rural) (ASER) for various years. Compiled and published by Pratham India, ASER is an annual household survey to assess children's schooling status and basic learning levels in terms of reading and mathematical ability. It provides a mirror image of rural public education system and collects data for a representative sample of children from every state and almost every rural district in India.

On an average ASER survey reaches over 560 districts each year, surveying on average of 650,000 children in more than 16,000 villages and 30 randomly selected villages in each district in the country[11]. This is about twice the size of the rural sample of the National Sample Survey (NSS), the alternative source for learning outcome data in India. Use of ASER data also provides the latest empirical base to measure quality of elementary education in India.

2.2. PARAMETERS

Learning outcome of elementary school children has been tracked using three parameters as under:

a) Percentage of children in Std.3 who can read a Std.2 level text

b) Percentage of children in Std.5 who can read Std.2 level text, and

c) Percenttage of children in Std.8 who can read Std.2 level text

On the other hand, in order to track mathematical ability of the elementary school children, the following three parameters have been chosen:

a) Percentage of children in Std.3 who can do at least subtraction

b) Percentage of children in Std.5 who can do division, and

c) Percentage of children in Std.8 who can do division

Based on various rounds of ASER reports, the time period of the present paper starts from 2010 onwards. This is the period from which the Right to Education Act was implemented.

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[11] In each district, 30 villages are sampled from the census 2001 village list using Probability Proportional to Size (PPS) sampling technique. The sample design employs a rotation panel of villages. Each year, 10 villages from three years ago are dropped and 10 new villages are added.

2.3 METHODOLOGY

To begin with, the state level data on reading and mathematical abilities as presented in ASER reports – from 2012 to 2018, have been collected. In order to get a standard indicator of learning outcome of elementary school children in different states over different years, the Learning Outcome Index at Std.3, 5, and 8 levels have been calculated[12]. This is a composite index calculated after taking the geometric mean of reading and mathematical abilities of children in percentage terms, in rural government schools in each state. The relative picture of learning outcome of elementary school children among 24 major states of India was calculated by the Rank Analysis method. An attempt has also been made to calculate the Average Growth Rate of learning outcomes of children at Std.3, 5 and 8 levels among different states of India. Finally, on the basis of the analysis of secondary sources, the paper tries to investigate possible factors which influence learning outcomes of children in rural India.

2.4 OVERVIEW OF EXISTING LITERATURE

We are facing a global learning crisis. Across low and middle-income countries, just four out of ten children will be on track to gain secondary level skills by 2030, and in lower middle-income countries, only 88% of children are completing primary school (Education Commission, 2016). More than half of children in India (54.8%) are in "learning poverty," or unable to read and understand a simple text by the age of 10 (World Bank, 2019a), and nearly three quarters of rural children in Grade 3 are unable to read at grade level (ASER, 2019).

The 2018 World Development Report identifies three key dimensions of learning outcomes in low income countries – low levels, high inequality, and slow progress. The average student in low-income countries performs worse than 95% of the students in high-income countries. There is also high inequality in learning outcomes in high and middle income countries. There are large gaps among learners and the students from the poor and disadvantaged sections of the society are generally among the low scorers. Changes in learning outcomes in recent decades have also been excruciatingly slow. Students often learn little from year to year, while early learning deficits are magnified over time (World Bank, 2018). At the current rate of improvement, it will be impossible to reach even a target of universal basic literacy and numeracy by 2030 (World Bank, 2019b).

Every girl and boy in India have the fundamental right to quality education, an education one that helps them to acquire basic literacy and numeracy, enjoy learning without fear and feel valued and included irrespective of where they come from. However, poor quality education is leading to poor learning outcomes in India, ultimately pushing children out of the education system and leaving them vulnerable to child labour, abuse and violence (UNICEF, n.d.).

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[12] Adapted from Kundu, Amit and Biswas, Puja (2017), Learning Outcomes in Elementary Education in Rural India: An Inter-State Comparison, Department of Economics, Jadavpur University, India, Munich Personal RePEc Archive, https://mpra.ub.uni-muenchen.de/94364/

Mere reading and writing do not make a child literate. A child needs to understand every aspect that he or she learns. If a child does not learn anything substantial, why would parents send their children to schools? In rural areas, since the main occupation is agriculture, many children work as farm hands, instead of going to schools. To keep them in schools, we must make children realise that they are learning something which they could utilise in future to earn a living. The NSSO (1998) survey suggested that the main reason for dropout is the lack of interest among students. If we can make children learn - things that help them achieve in life, the dropout rates could be minimised.

The past couple of decades have witnessed gradual enhancement in both Gross Enrolment Ratio (GER) and Net Enrolment Ratio at elementary level in most of the Indian states. The country is close to "schooling for all". However, as the saying goes, schooling is not the same as learning (World Bank, 2019b). The learning outcomes have been largely compromised. The quality of education, measured by the knowledge that student gains is substantially more important for economic growth than the mere quantity of education as measured by number of pupils and number of school years (Hanushek & Woessmann, 2007).

Children are not achieving class-appropriate learning levels (Sahni, 2015). Low learning levels and dropout rates continue to be high for the state and central governments. Without urgent help, students cannot effectively progress in the education system, and so improving the quality of learning in schools is the next big challenge. There are also disparities existing between states, with large gaps in learning levels: While across rural areas of India 50% of students in Grade 5 can read a Grade 2 level text, in the state of Himachal Pradesh, the rate is 77%, compared to 34% in the state of Jharkhand (ASER, 2019).

Students in the 'top schools' of India exhibit rote learning and perform comparatively better in questions that are procedural or do not involve deeper understanding or application of concepts. Practical competencies such as map reading, using good language while writing, measurement, general awareness of well-known facts, etc. are not developed well. Students seem to harbour several misconceptions in the different subjects As they move to higher classes, although the overall performance improves, the number of students holding on to same misconception continues, which indicates that if a student develops a misconception in a lower class, then it is more likely to continue in higher classes too without getting corrected (Educational Initiatives, 2012).

Alcott & Rose (2017) find that students from the poorest households are 16 percentage points less likely to be able to subtract than those in the wealthiest households. Large-scale assessments show that learning varies by wealth, with the poor on average about 20 percentage points less likely to be numerate than the well-off. However, achieving equality in learning across wealth quintiles would still leave more than 30% of the poor innumerate, as even the more economically advantaged have relatively low learning outcomes (Kaffenberger, 2019). This underscores the need to improve learning outcomes for all – not just equalize currently low rates of learning across the board.

Quality education is crucial to serving the needs of India's young population. Of a total population of 1.3 billion, more than a quarter are aged 0-14 (World Bank, n.d.). Muralidharan (2018) argues that the most important education outcome in India is the achievement of universal functional literacy and numeracy by the end of Grade 3 by 2022, and outlines the need for investments in universal preschool, supplemental instruction for children falling behind, and independent measurement and monitoring of progress toward this outcome.

The consequences of the learning crisis are far-reaching and costly to society. Low educational attainment has a direct negative impact on individual earnings, income distribution, and economic growth (Hanushek & Woessmann, 2007). There is a huge gap between the market definition of required skilled manpower and the existing potential. Worldwide, hundreds of millions of children reach young adulthood without even the most basic skills like calculating the correct change from a transaction, reading a doctor's instructions, or understanding a bus schedule - let alone building a fulfilling career or educating their children (World Bank, 2019b).

An increased emphasis on education outcomes is also quite evident. The think tank NITI Aayog, in partnership with a range of actors including the Ministry of Human Resource Development (MHRD), the states and Union Territories (UTs), and the World Bank, recently released a report on the School Education Quality Index (SEQI), which tracks education data across the states and UTs, to enable the assessment of policy interventions (NITI Aayog, 2019). The index tracks a range of indicators across two main categories: outcomes, which includes learning, access, infrastructure and facilities and equity outcomes, and governance processes aiding outcomes. The report finds high levels of variation in overall performance by geography, as well as improvements for most states and UTs between 2015-16 and 2016-17.

RESULTS AND DISCUSSION

3.1 LEARNING OUTCOME INDEX (LOI)

As already mentioned, Learning Outcome Index is an indicator of the learning ability among children enrolled in government schools at Std.3, 5, and 8 levels. LOI_{3i} stands for Learning Outcome Index for Std.3 level children of the ith state, which is calculated by using the following formula:

$$LOI_{3i} = (A_iB_i)^{1/2}$$

Where, A_i indicates percentage children in Std.3 of the ith state who can read a Std.2 level text and B_i indicates percentage of children in Std.3 of the ith state who can do at least subtraction. Higher value of LOI_3 means better learning outcome among children at Std.3 level.

At the all-India level, Learning Outcome Index of Std.3 children (LOI_3) declined by 2.76 percentage points between 2010 and 2012 (from 23.24% to 20.48%), but improved marginally by 0.13 percentage points between 2012 and 2014 (from 20.48% to 20.61%), 1.34 percentage points between 2014 and 2016 (from 20.61% to 21.95%), and 1.14 percentage points between 2016 and 2018 (from 21.95%. to 23.09%). Overall, between 2010 and 2018, the all-India figure of LOI_3 recorded a decline of 0.15 percentage points (Figure 2).

Figure 2: All-India Values of Learning Outcome Indices for Std.3, 5 and 8 Level Children (%)
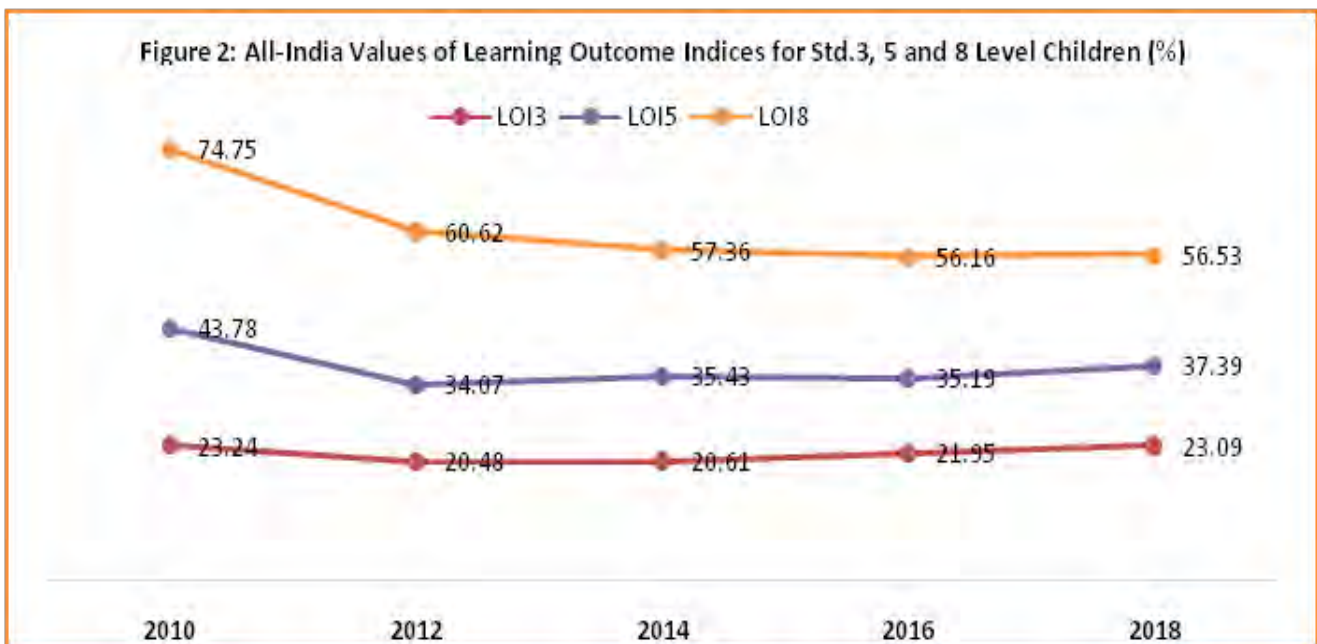
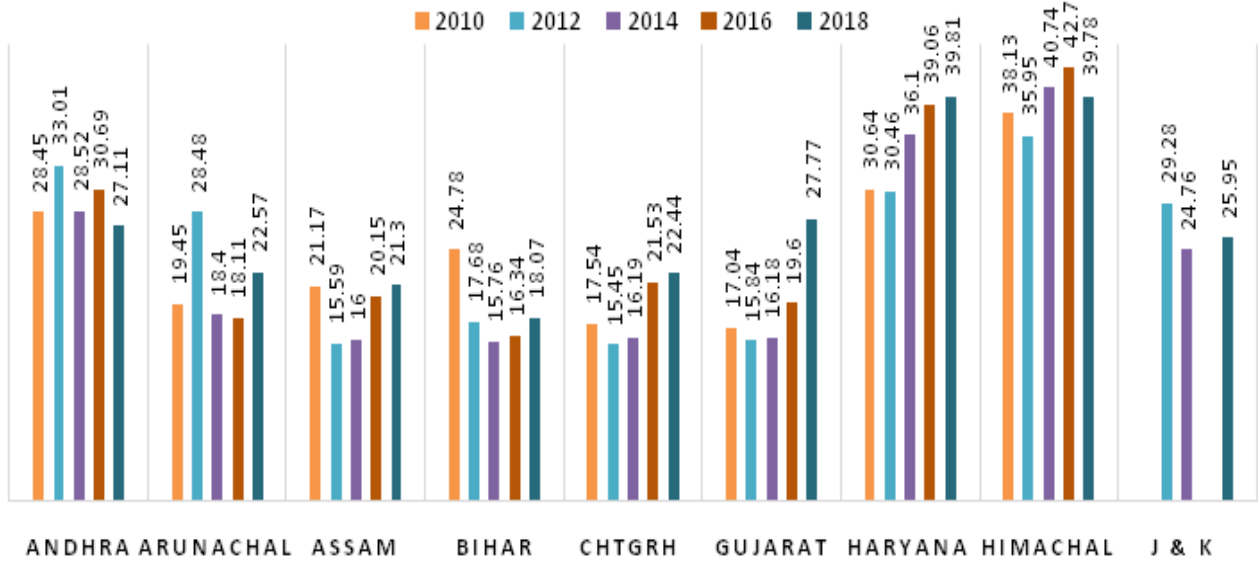Figure 3.1.1: The Values of Learning Outcome Index – Std.3 (LOI3) for States (%)

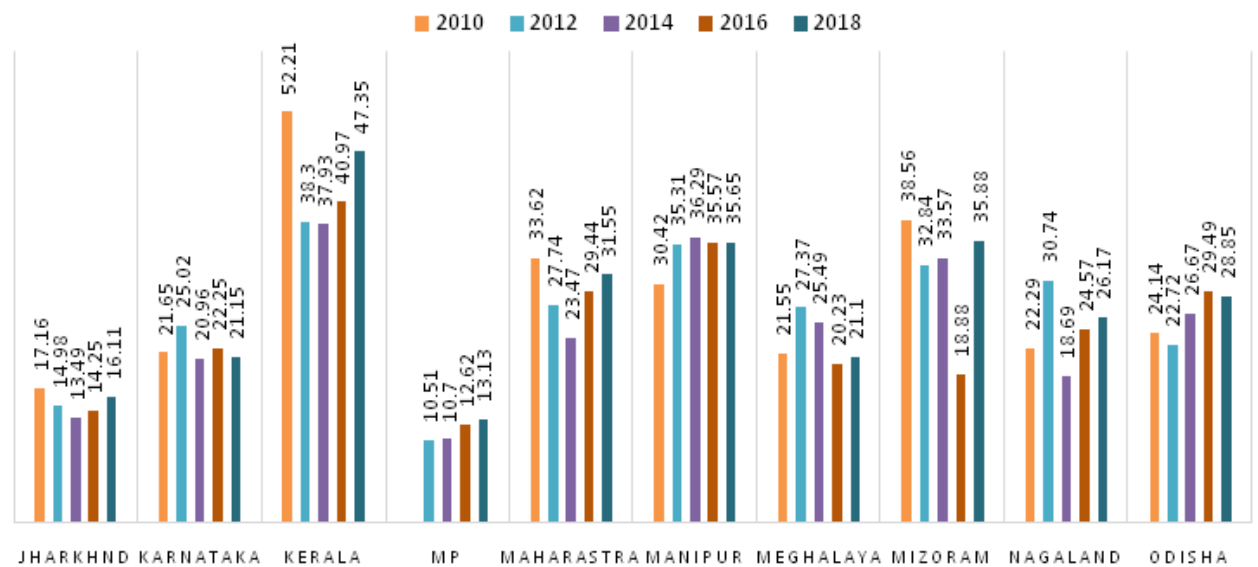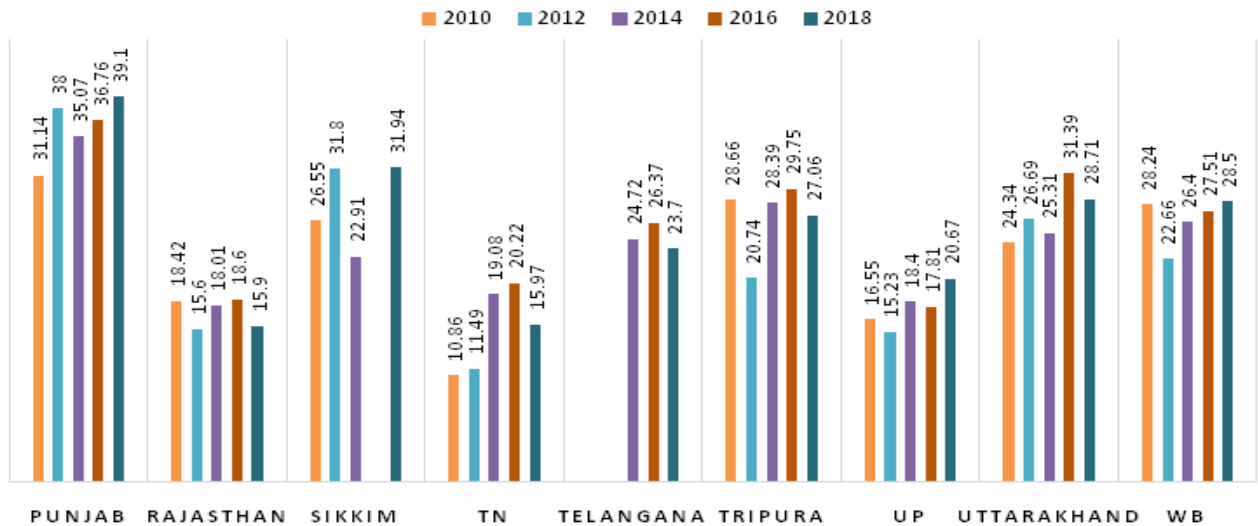Figure 2.1.2: The Values of Learning Outcome Index – Std.3 (LOI3) for States (%)

Figure 2.1.3: The Values of Learning Outcome Index – Std.3 (LOI3) for States (%)

The state level analysis of learning outcomes of Standard-3[13] level children, using LOI has been presented in Figures 3.1.1, 3.1.2 and 3.1.3.

All the states except Andhra Pradesh, Arunachal Pradesh Karnataka, Manipur, Meghalaya, Nagaland, Punjab, Sikkim, and Uttarakhand recorded a fall in their LOI_3 while moving from 2010 to 2012. Similarly, while moving from 2012 to 2014, all states except Assam, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Manipur, Mizoram, Orissa, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, and West Bengal recorded a fall in learning outcome of elementary school children at Std.3 level (Figure 3.1)[14].

Between 2014 to 2016, echoing the national trend, all states (with comparable data available) except Arunachal Pradesh, Manipur, Meghalaya, Mizoram, and Uttar Pradesh, recorded a rise in the value of learning outcome index (LOI_3). Similarly, moving from 2016 to 2018, all states except Andhra Pradesh, Himachal Pradesh, Karnataka, Odisha, Rajasthan, Tamil Nadu, Telangana, Tripura, and Uttarakhand, have shown an uptrend in the value of learning outcome index (LOI_3).

Figures 3.2.1, 3.2.2 and 3.2.3 present state-wise learning outcome of Std.5 level rural children on the basis of LOI_5.

$$LOI_{5i} = (A_iB_i)^{1/2}$$

Where, A_i indicates percentage children in Std.5 of the ith state who can read a Std.2 level text and B_i indicates percentage of children in Std.5 of the ith state who can do division. Higher value of LOI_5 means better learning outcome among children at Std.5 level.

Figure 3.2.1: The Values of Learning Outcome Index – Std.5 (LOI5) for States (%)

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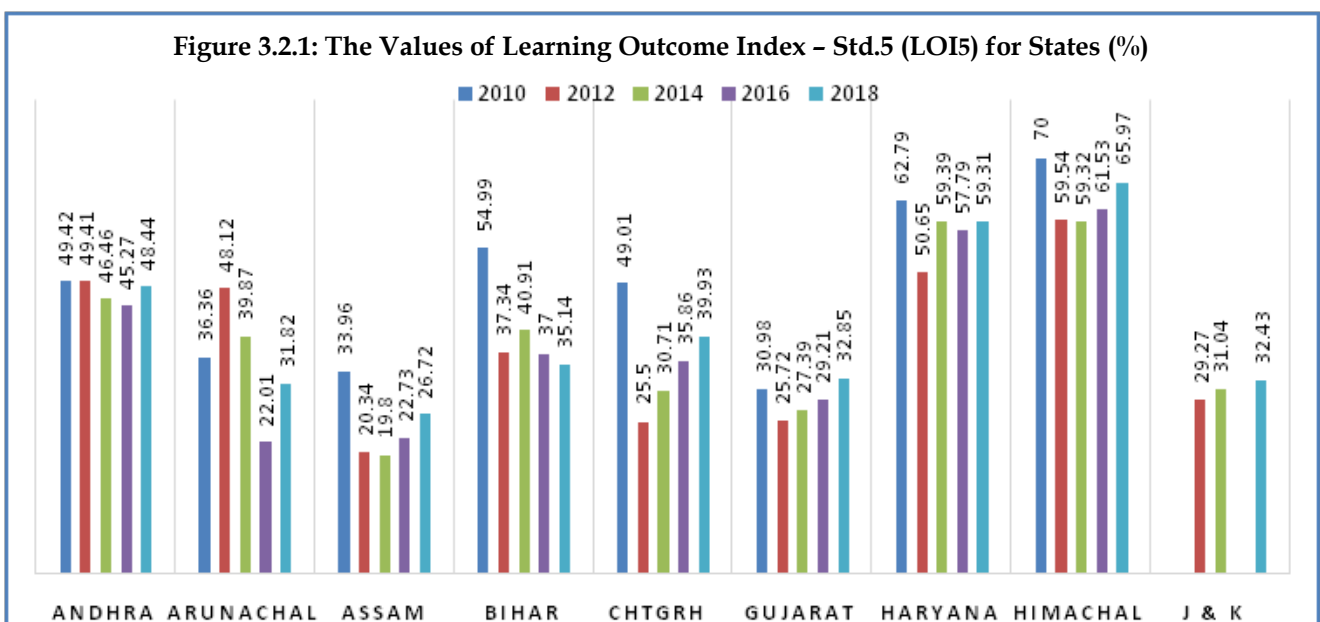
[13] A gap of two years is considered to get a better picture of change in learning outcomes of children at the elementary level in a state over time

[14] The tabular representation of this diagram is shown in the appendix

Figure 3.2.2: The Values of Learning Outcome Index – Std.5 (LOI5) for States (%)

Legend: 2010, 2012, 2014, 2016, 2018

State	2010	2012	2014	2016	2018
JHARKHAND	45.09	30.24	27.07	29.25	25.63
KARNATAKA	30	31.07	30.8	28.8	30.71
KERALA	60.81	54.71	51.11	51.68	58.08
MP	20.18	21.77	27.4	28.7	
MAHARASTRA	55.01	36.3	31.8	35.62	44.78
MANIPUR	52.15	53.32	60.36	60.92	58.38
MEGHALAYA	50.21	34.57	25.67	22.64	18.99
MIZORAM	66.86	50.92	45.65	35.7	50.84
NAGALAND	43.7	42.66	32.63	32.59	35.19
ODISHA	38.49	29.33	33.94	37.05	38.51

Figure 3.2.3: The Values of Learning Outcome Index – Std.5 (LOI5) for States (%)

Legend: 2010, 2012, 2014, 2016, 2018

State	2010	2012	2014	2016	2018
PUNJAB	69.75	60.89	54.34	57.59	61.6
RAJASTHAN	40.94	31.46	33.2	39.06	33.82
SIKKIM	45.67	51.94	38.02		22.83
TN	21.42	19.72	34.79	31.1	32.15
TELANGANA		42.86	37.84	34.41	
TRIPURA	38.27	27.67	31.85	31.86	29.39
UP	33.2	30.02	33.89	31.25	39.3
UTTARAKHAND	58.21	45.21	42.78	48.55	49.1
WB	45.08	37.26	41.58	38.15	38.8

At the all-India level, learning outcome of Std.5 children (LOI5) declined by a massive 9.71 percentage points between 2010 and 2012 (from 43.78% to 34.07%), but improved slightly by 1.36 percentage points between 2012 and 2014 (from 34.07% to 35.43%). Between 2014 and 2016, it declined by 0.24 percentage points (from 35.43% to 35.19%), but again improved by 2.2 percentage points between 2016 and 2018 (from 35.19% to 37.39%). Overall, between 2010 and 2018, the all-India figure of LOI5 recorded a significant decline of 6.39 percentage points (Figure 2).

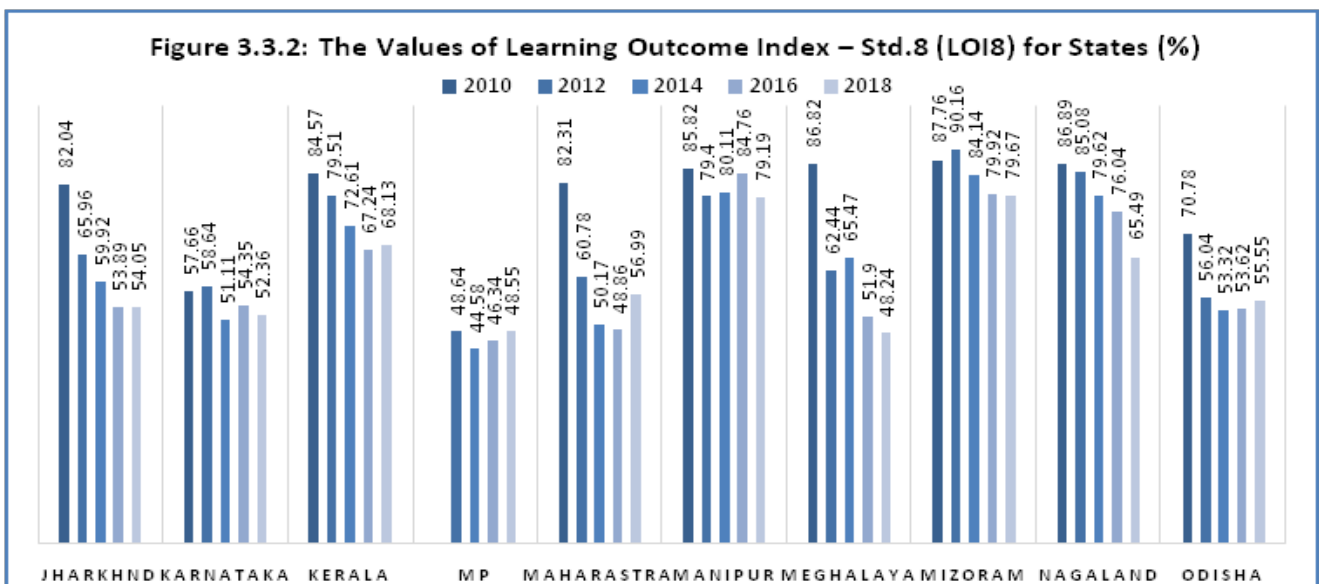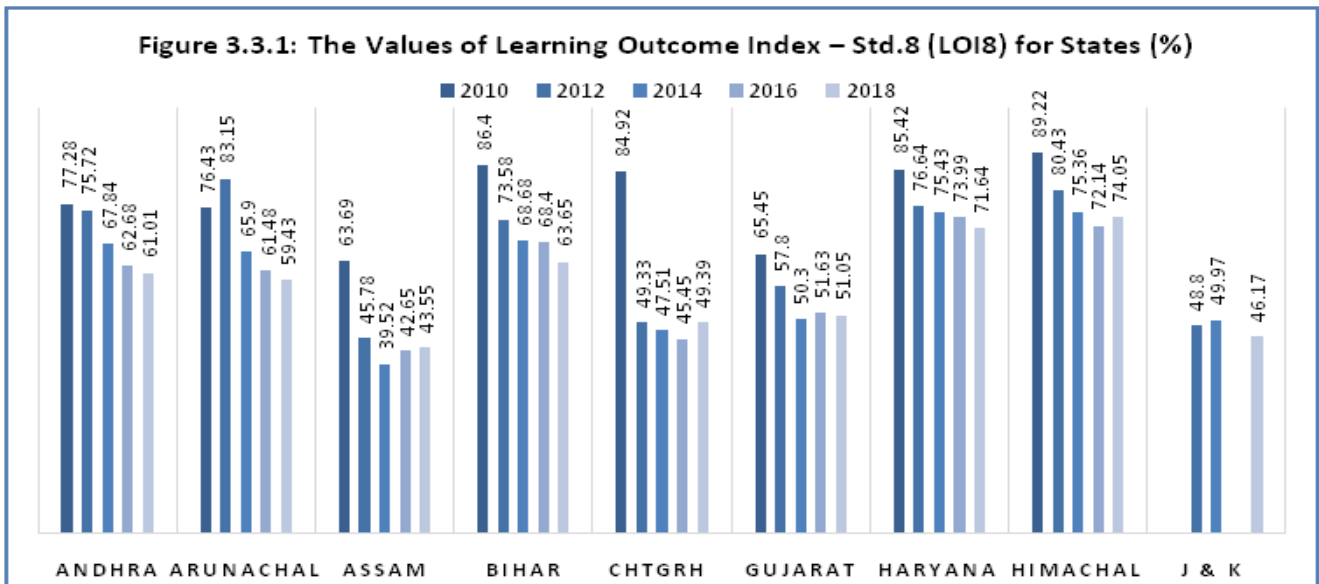All the states except Arunachal Pradesh, Karnataka, Manipur, and Sikkim marked a fall in their LOI5 while moving from 2010 to 2012. Between 2012 and 2014 also, all states except Bihar, Chhattisgarh, Gujarat, Haryana, J&K, Madhya Pradesh, Manipur, Odisha, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, and West Bengal marked a fall in learning outcome of elementary school children at Std.5 level.

Between 2014 to 2016 again, all states (with comparable data available) except Assam, Chhattisgarh, Gujarat, Himachal Pradesh, Jharkhand, Kerala, Madhya Pradesh, Maharashtra, Manipur, Odisha, Punjab, Rajasthan, and Uttarakhand, marked a rise in the value of learning outcome index (LOI5). Moving from 2016 to 2018, however, all states except Bihar, Jharkhand, Manipur, Meghalaya, Rajasthan, Telangana, and Tripura, marked improvement in the value of learning outcome index for Std.5 children (LOI5).

Next, we shall look at the learning outcome of the rural children at Std.8 level on the basis of LOI8. It is presented in Figures 3.3.1, 3.3.2 and 3.3.3.

$$LOI_{8}i = (A_iB_i)^{1/2}$$

Where, Ai indicates percentage children in Std.8 of the ith state who can read a Std.2 level text and Bi indicates percentage of children in Std.8 of the ith state who can do division. Higher value of LOI8 means better learning outcome among children at Std.8 level.

Figure 3.3.1: The Values of Learning Outcome Index – Std.8 (LOI8) for States (%)

Figure 3.3.2: The Values of Learning Outcome Index – Std.8 (LOI8) for States (%)

Figure 3.3.3: The Values of Learning Outcome Index – Std.8 (LOI8) for States (%)
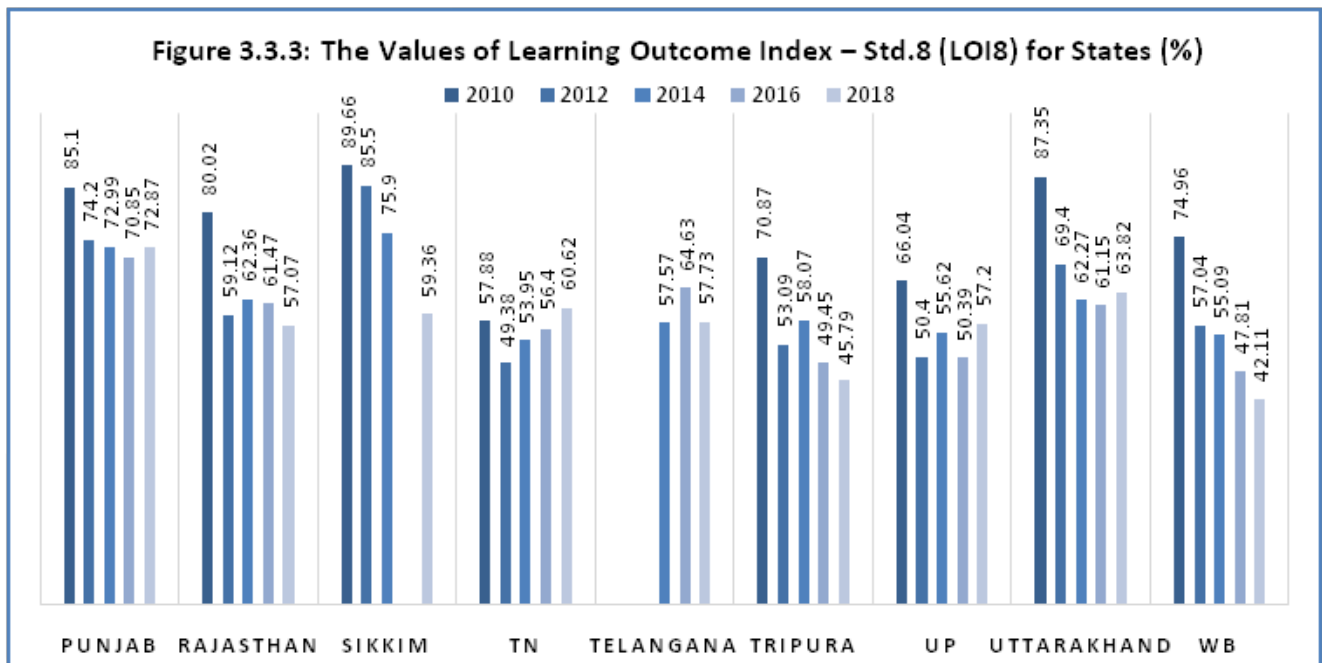
The all-India picture (Figure 2) shows that the value of LOI8 among children has also recorded a continuous fall of 14.13 percentage points between 2010 and 2012 (from 74.75% to 60.36%), 3.26 percentage points between 2012 and 2014 (from 60.62% to 57.36%), and 1.2 percentage points between 2014 and 2016 (from 57.36% to 56.16%). Between 2016 and 2018, however, it increased very slightly by 0.37 percentage points (from 56.16% to 56.53%).

Following the national trend, all the states except Arunachal Pradesh and Mizorum recorded a fall in their learning outcome index while moving from 2010 to 2012. Between 2012 and 2014 also, all states except Jammu & Kashmir, Manipur, Meghlaya, Rajasthan, Tamil Nadu, Tripura and Uttar Pradesh, recorded a fall in LOI8 (Figure 3.3.2).

Between 2014 to 2016 again, all states except Assam, Gujarat, Karnataka, Madhya Pradesh, Manipur, Odisha, Tamil Nadu, and Telangana, recorded a fall in the value of learning outcome index (LOI8). Between 2016 and 2018, however, all states except Andhra Pradesh, Arunachal Pradesh, Bihar, Gujarat, Haryana, Karnataka, Manipur, Meghalaya, Mizoram, Nagaland, Rajasthan, Telangana, Tripura, and West Bengal, have recorded a rise in the value of learning outcome index for Std.8 children (LOI8) (Figure 3.3.3).

3.2. RANKING OF STATES BY LEARNING OUTCOME INDEX

To draw a comparative analysis of learning outcome of children in different states of India over time, states have been ranked by their learning outcome Index, using the Rank Analysis Method. Figure 4 presents ranking of states by learning outcome index of Std.3 level children[15].

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[15] The tabular representation of this figure is given in the appendix

Figure 4 clearly shows that Kerala occupies the highest rank in LOI₃ in 2010 and 2012. In 2014 and 2016, it loses its highest rank to Himachal Pradesh, which is another state doing so well in terms of elementary education. In 2018, however, Kerala regains its highest rank, while Himachal Pradesh occupies the second highest rank at the all-India level.

Figure 4: Ranking of States by Learning Outcome Index of Std.3 Children (LOI₃)
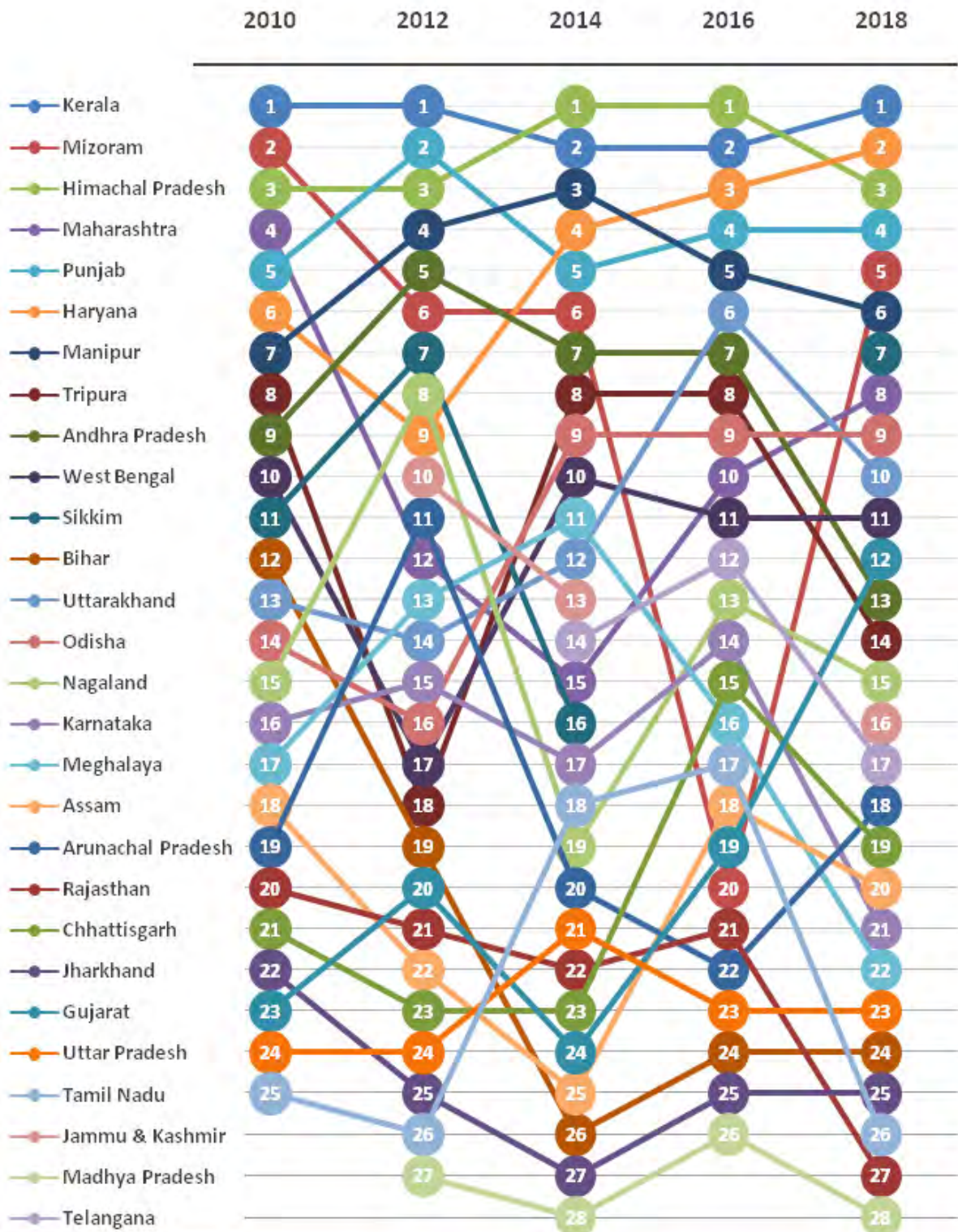
Mizoram, which attained the second highest rank in 2010, couldn't maintain its high position and fell to 6th rank in 2012 and 2014, and further to 20th rank in 2014, which went up to 5th rank in 2018. Punjab has done consistently good in maintaining its high 6th rank during all these years between 2010 and 2018. Odisha is also quite a performer in terms of learning outcome index of Std.3 children. Ranked 14th and 16 in 2010 and 2012, respectively, it attained a high 9th rank in 2014, which was maintained in 2016 and 2018 also.

Bihar, Jharkhand, Rajasthan, Chhattisgarh, Madhya Pradesh and Uttar Pradesh have consistently performed poorly in terms of learning outcome index of Std.3 children. Ranking of Bihar dropped from a moderate 12th in 2010 to 19th in 2012 and a precarious 26th in 2014. It recovered only slightly up to 24th position in 2016 and 2018.

The ranking of Jharkhand ranges between 22nd to 27th through these years, while Madhya Pradesh has attained a rank higher than 26th, out of the 28 states for which LOI3 were calculated (Figure 4).

Ranking of states by learning outcome index of Std.5 level children (LOI5) is presented in Figure 5.

Interestingly, it is Himachal Pradesh and not Kerala, which holds the highest rank for learning outcome index of Std.5 level children among all the states of India. In 2010 its rank was 1st, which slightly went down to 2nd and 4th in 2012 and 2014, respectively, but it regained its no.1 position in 2016 and 2018. Punjab and Haryana have also preformed consistently well. Punjab improved its ranking from 2nd in 2010 to 1st in 2012. In 2014 and 16, it went slightly down to 4th position in 2014 and 2016 but went up to 2nd position in 2018 again. Kerala ranked 5th in all the mentioned years, except for 2012 when it went up to 3rd highest rank.

Figure 5: Ranking of States by Learning Outcome Index of Std.5 Children (LOI5)
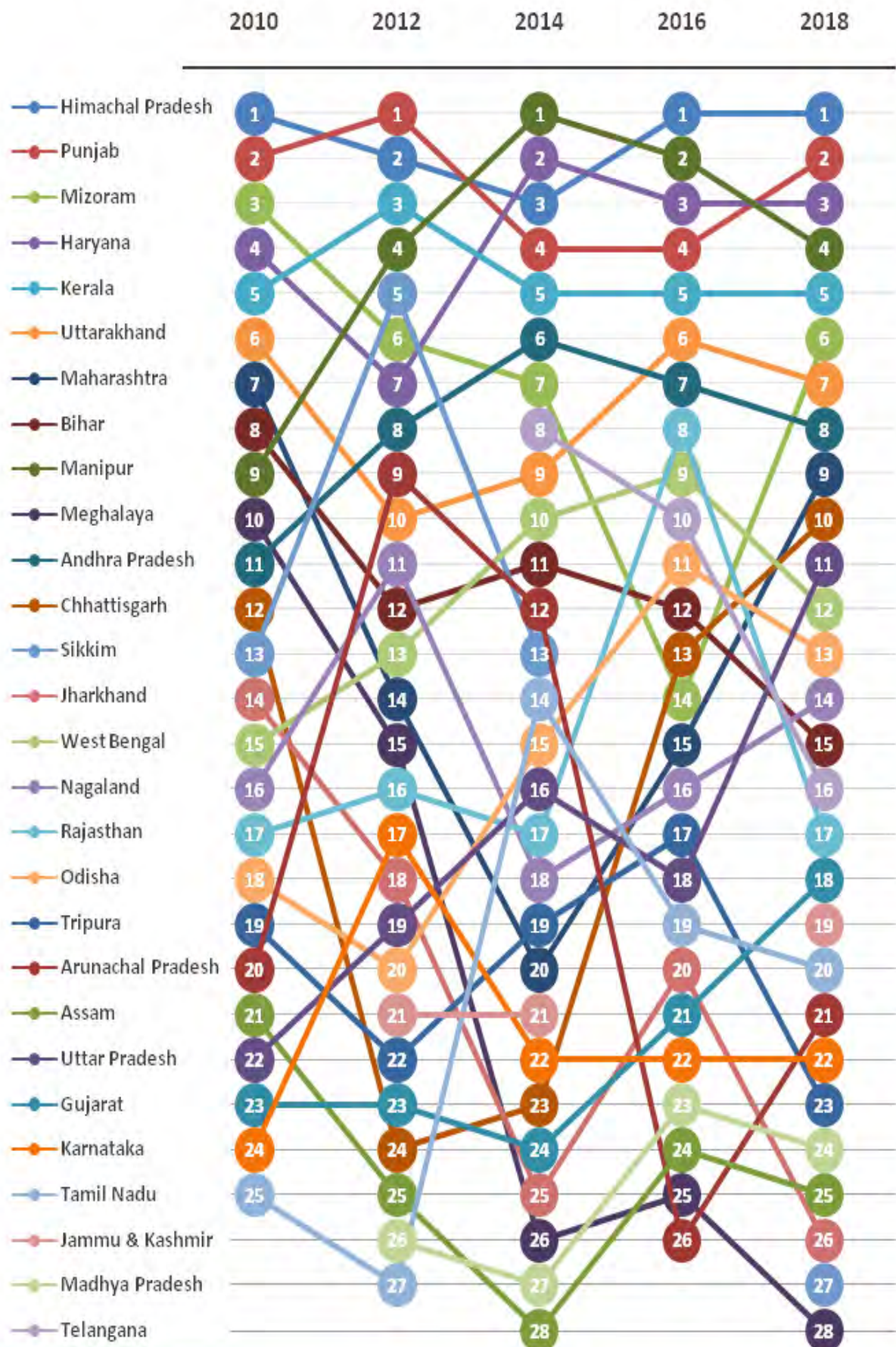
Jharkhand, Madhya Pradesh and Gujarat couldn't be proud of their ranks all these years. In fact, Jharkhand fell from 14th position in 2010 to 18th in 2012 and 25th in 2014. In 2016, it slightly went up to 20th but fell to a precarious 26th position again in 2018. The same is the story with Madhya Pradesh. Between 2012 and 2018, its ranking has ranged between 23rd to 27th positions only.

Finally, ranking of states by learning outcome index of Std.8 level children (LOI8) is presented in Figure 6.

Sikkim occupied the top position for LOI8 in 2010, but somewhat slipped down to 2nd and 3rd positions in 2012 and 2014, respectively. We don't have data for 2016, but Sikkim was ranked 13th among the 28 major states of India in 2018. Himachal Pradesh maintained 2nd position in 2010 but slid to 5th and 6th positions in 2012 and 2014, respectively. It again recorded a rise from 5th to 3rd rank between 2016 and 2018. But the surprise performance in LOI8 are from states like Mizoram and Nagaland. Ranked 3rd in 2010, Mizoram consistently maintained number one position in all reference years except for 2014, when it could hold 2nd position only. On the other hand, Nagaland moved on from rank 5 to 3, which was maintained in subsequent period 2014 and 2016, but fell to 7th rank in 2018.

Kerala, Punjab, Haryana and Arunachal Pradesh have also maintained good ranks in LOI8 through the years. Kerala had remarkable improvements in its rank from 12th in 2010 to 6th in 2012. In 2014 and 2016, its rank was 8th, which further improved to 6th in 2018. Ranking of Punjab has also improved consistently from 10th in 2010 and 2012 to 7th in 2014, 6th in 2016 and 4th in 2018. Tamil Nadu improved its ranking significantly from 24th in 2010 and 23rd in 2012 to 20th in 2014, 14th in 2016 and 11th in 2018.

The states performing poorly in terms of ranking of learning outcome index of Stad.8 children (LOI8) include, among others, Assam, West Bengal, Tripura and Jammu & Kashmir. Ranking of Assam fell from a lowly 24th in 2010 to the second lowest (27th) in 2012 and the lowest (28th) in 2014. In 2016 and 2018 also, it was ranked 26th and 27th only among the 28 major states of India. The same has been the story for West Bengal whose rank has consistently fallen from 18th in 2010 to 19th in 2012 and 2014, and further to 24th and last position (28th) in 2016 and 2018.

Figure 6: Ranking of States by Learning Outcome Index of Std.8 Children (LOI8)
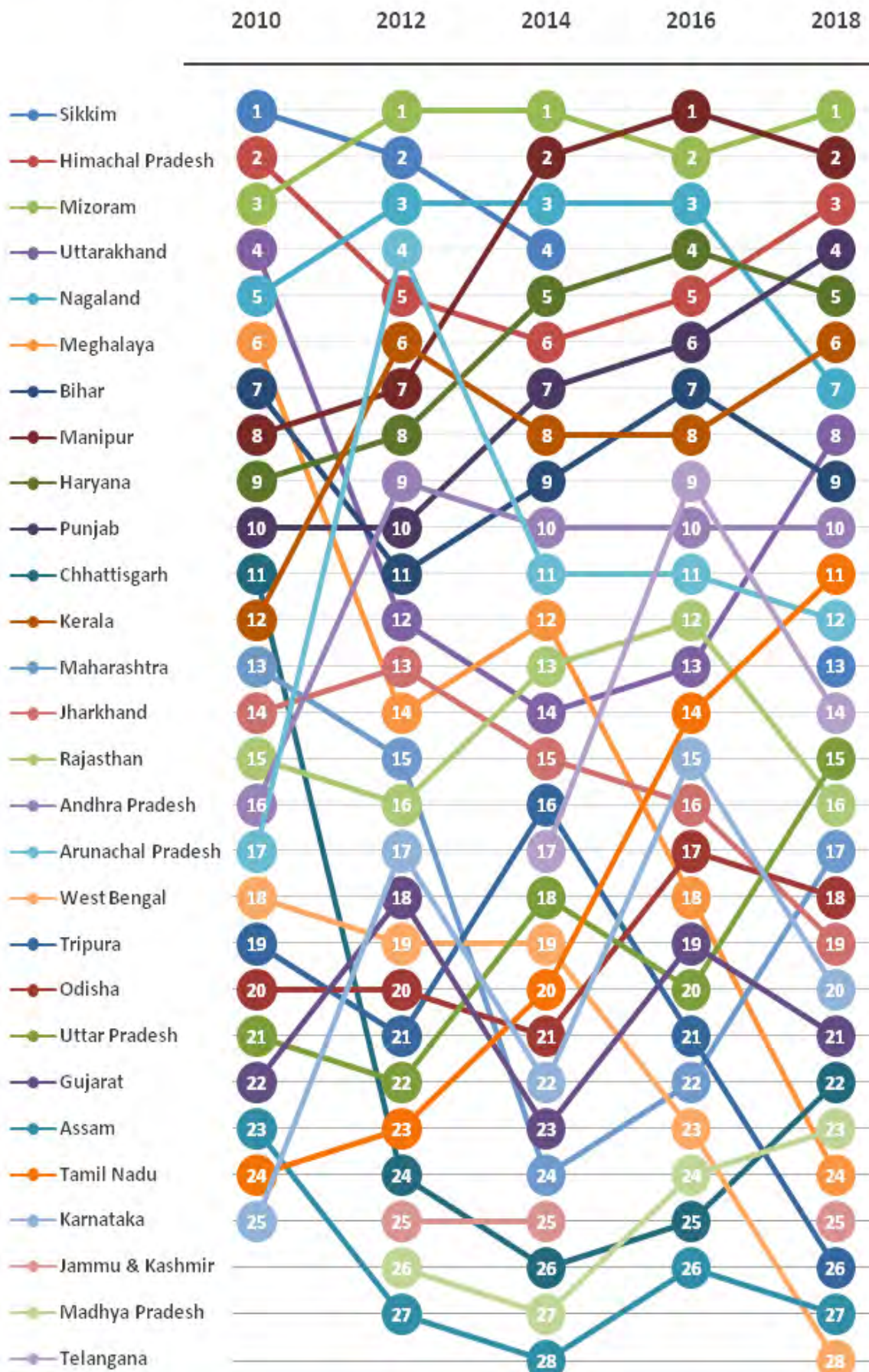
3.3 AVERGE GROWTH RATE OF LEARNING OUTCOME INDEX

Figures-4, 5 and 6 clearly draw our attention to fluctuations in the ranks of several states for their learning outcome indices (LOI3, LOI5 and LOI8) in different years. Therefore, it becomes imperative to investigate whether there is any average enhancement of LOI3, LOI5 and LOI8 of different states over the years or not, and if yes, how much. This would help to find out whether the learning outcome of children at the lementary level, in different states shows improvement or not. Basically, the Average Growth Rate of LOI3, LOI5 and LOI8 (learning outcome indices of Std.3, 5 and 8 children) reflect how LOI3, LOI5 and LOI8 have changed over time. It can take positive or negative value. None the less, it is an importatant statistics as it reflects the trend of the variable(s) in question.

Variations in Average Growth Rate while moving from Std.3 level children to Std.5 and Std.8 levels are presented in Figure 7[16].

It is found that except for a very marginal average growth rate (0.11%) in Learning Outcome Index for Stad.8 level children (LOI8), the all-India average growth rates of Learning Outcome Index for Std.3 and 5 level children (LOI3 and LOI5) have marked a fall of 6.43% and 3.15%, respectively, overtime.

For Std.3 level children, except for Tamil Nadu, all the states have marked a fall in their average growth rates (LOI3) overtime. West Bengal (-12.12%), Meghalaya (-12.75%), Jharkhand (-9.63%), Tripura (-9.49%) and Rajasthan (-7.31%) showed the highest fall among the 27 states of India.

Similarly, for Std.5 level children, except for Tamil Nadu, Madhya Pradesh, Uttar Pradesh, Arunachal Pradesh, and Manipur, all other states have recorded a fall in the average growth rates of their learning outcome index (LOI5) overtime. Tamil Nadu (15.31%) and Madhya Pradesh (12.83) have shown highest increase, while Megahlaya (-21.2%), Jharkhand (-11.93%) and Bihar (-9.28%) marked highest fall in LOI5.

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[16]   The tabular representation of this diagram is given in the appendix

Figure 7: Average Growth Rate of Learning Outcome Indices - LOI3, LOI5 and LOI8 (%) (2010-2018)
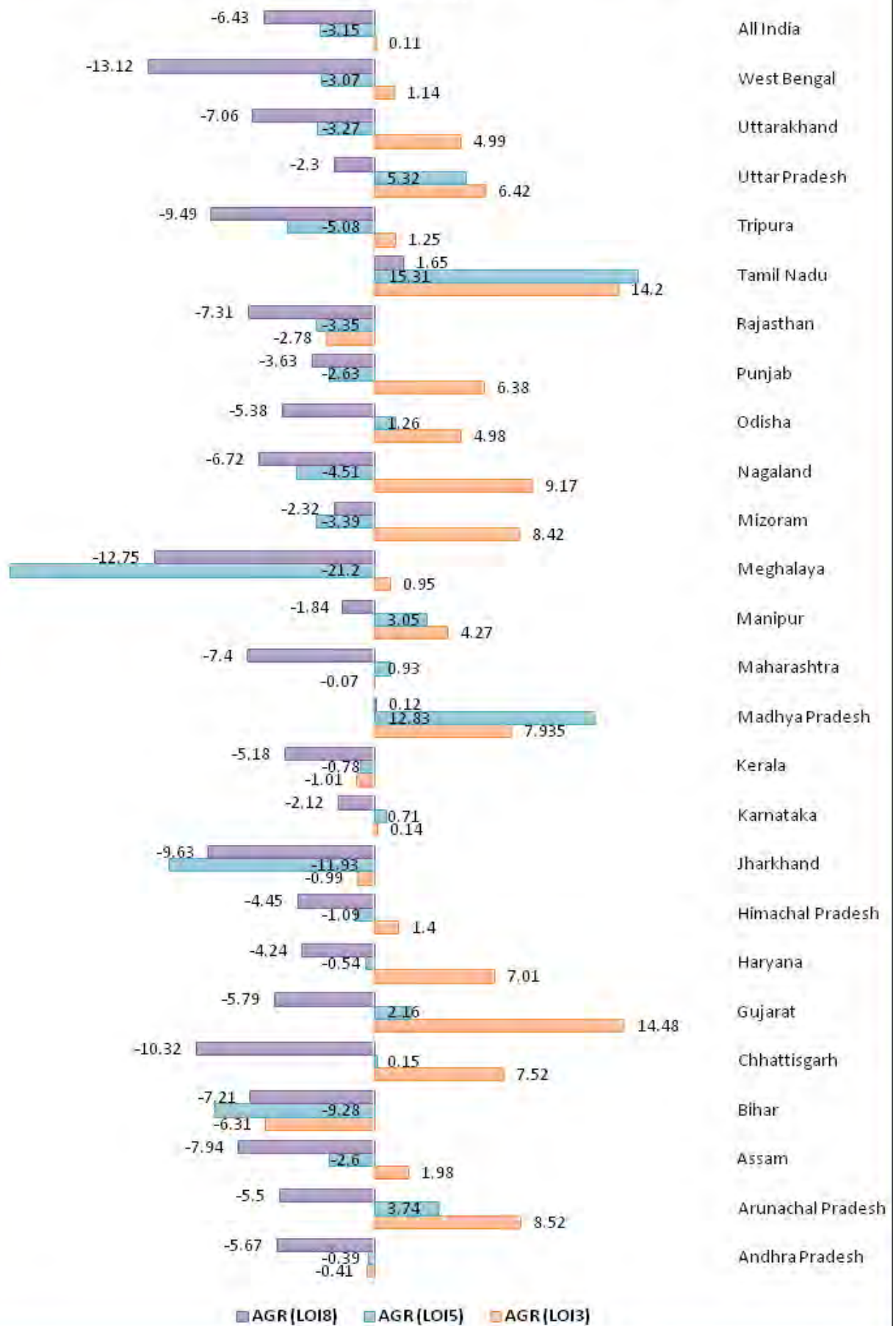
For Std.8 level children in rural India, however, except for Bihar (-6.31%), Rajasthan (-2.78%), Kerala (-1.01%) and Jharkhand (-0.99%), the average growth rate of learning outcome index (LOI$_8$), has recorded a rise overtime. The highest avergae growth was recorded by Gujarat (14.48%) and Tamil Nadu (14.2%), followed by Nagaland (9.17%), Mizoram (8.42%), Arunachal Pradesh (8.42%), Madhya Pradesh (7.94%) and Uttar Pradesh (6.42%).

Thus it can be concluded that despite of the fall in average growth rate of learning outcome for Stad.3 and 5 children, there are a few states which marked a rise over the years. On the other hand, while the average growth rate of learning outcome for Std.8 children has shown a general uptrend, there are some states which recorded a fall over the years.

FACTORS FOR LOW LEARNING OUTCOMES

A review of a large body of research indicates several factors leading to low or poor learning outcomes at the elementary level. These range from teaching methods, particularly the extent to which learner-centred methods are used, to teacher motivation, availability of learning materials, learners' health and nutritional status and community participation (Hanushek, 2005; Watkins, 2000; VSO, 2002; Pinnock & Vijayakumar, 2009, as cited in Jhingan, 2019).

Other complex sets of factors that add to the issue and intersect and reduce learning opportunities and outcomes further for the groups of disadvantaged children are - responsibilities at home (e.g., taking care of younger siblings/ contributing to household work), lack of academic support at home, low self-esteem and self-confidence, alienation due to difference in home and school language, and teacher attitude and expectations.

Given below is a brief description of the main factors causing low learning outcomes in the country:

I. Student and household charactistics

In India, as in other parts of the world, student and household characteristics such as parental schooling, social status, language spoken at home, and family size and composition, are strong predictors of student achievement. Children born to poorly educated parents in underprivileged families learn the least, perpetuating intergenerational inequities (ASER, 2016). As compared to poor and uneducated parents, affluent and educated parents are likely to offer their children more motivation, encouragement, and assistance with studies. With few exceptions, living standards heavily influence student achievement. In some cases, achievement is 3 to 4 times higher for the richest quintile of students than for the poorest (Dundar et al. 2014).

More affluent students have a more supportive learning environment at home; better access to achievement-enhancing inputs, such as private tuition; and access to better quality schools. The large economic differences in achievement highlight the importance of enhancing school quality for students from low-income backgrounds. Several studies also highlight the crucial role of early home support, including reading aloud to children, encouragement for reading for enjoyment and print availability at home. Nevertheless, student background only explains a portion of the variation in student achievement.

II.   Poor health and malnutrition of children

Child health and nutrition are closely associated with educational achievement (Behrman, 1996). Leslie and Jamison (1990), for example, write that the strongest case can be made for a negative effect of nutritional deficiencies on school outcomes. Research has consistently found protein-energy malnutrition and iron-deficiency anemia to have significant negative effect on tests of cognitive function in both pre-school and school age children, and on attendance and achievement among the latter.

However, such associations do not necessarily indicate causality (Glewwe, 2005). Empirical evidence from India also shows that malnutrition in early childhood is linked to deficits in the cognitive development of children. These effects persist through school and result in impaired learning capacities. Stunting in children delays school enrolment and is found to be associated with grade repetition and a higher dropout in primary school children (Sood, 2010).

III.   Little pre-school experinece of children

Quality preschool education helps in developing oral language and emergent literacy and numeracy skills among children, which is the foundation for learning in early grades. Investments in Early Childhood Development (ECD) promotes school readiness and better education outcomes. Participation in quality ECD programmes results in higher levels of attention, learning outcomes, completion rates, and school attainment (Kagitcibasi, Sunar, and Bekman 2001; Schweinhart et al. 2005; Aboud 2006; Vegas and Petrow 2008; Berlinski, Galiani, and Gertler 2009, as cited in Dundar et al. 2014).

School systems that have a 10-percentage point advantage in the proportion of students who had attended preschool scored an average of 12 points higher in the Programme for Student Assessment (PISA) reading assessment (OECD, 2011). When children come to school underprepared, not only are their own chances of success limited but they can have a detrimental influence on classroom dynamics and the experiences of all their classmates (Wentzel and Wigfield 1998; Reynolds et al. 2001, as cited in Jhingan, 2019).

Children who come with pre-school experience are already aware of print and its importance and have experience of handling (orientation of books/newspapers, left to right movement of eyes while reading printed material). Their acquaintance with print and abilities to symbolize gain further momentum, laying a strong foundation for learning in school. Unfortunately, access and participation in preschool education is low and varied in India.

IV. Poor quality of teachers

While many factors contribute to the low quality of education, substandard teaching is one of the foremost factors in the country. Evidence suggests that teachers do not know their subjects thoroughly. The rapid expansion of schooling has been accompanied by a demand for teachers that has been met by relaxing recruitment standards in many states. The colossal expansion since late 1990s has been accomplished by recruiting many contract or para teachers[17] with little or no training, which has produced a huge pool of poorly qualified teachers. A survey (NUEPA, 2012) found that about half of the 4.7 million elementary school teachers in India had not completed secondary school themselves. The only state which comes close to Gujarat, one of the economically prosperous states in India, in terms of poor quality of teachers is Karnataka, another highly prosperous state, with about three-fourth of its teachers having studied only upto the higher secondary level[18]. This is much unlike Finland where only the top graduates are considered for a career in teaching.

Using SchoolTELLS data, Kingdon and Banerji (2009) found that in rural India at the grade 5 level of difficulty, only 28 percent of the teachers could solve an area problem and only 25 percent could work out a percentage. About 60 percent of the teachers made spelling mistakes in their two-sentence summaries of a section from the textbook. As many as 80 percent admitted to having difficulty in responding to student math queries. Improving teaching may thus be the most effective way to raise school quality (Glewwe and Kremer, 2006, as cited in Dundar et al. 2014), and its benefits can translate into economic gains for the entire country.

V. Ineffective teacher training

Preparing teachers for the challenges of a changing world involves equipping them with subject-specific expertise, effective teaching practices, an understanding of technology, and the ability to work collaboratively with other teachers, parents, and community members (UNESCO 2004, as cited in Dundar et al. 2014). However, in-service as well as pre-service training programmes in most states prepare teachers based on a pedagogy and curriculum that doesn't serve them well in their actual class environment. More than 78% of primary schools have three or fewer teachers to attend to all grade levels, making multi-grade teaching a necessity (Blum and Diwan, 2007). Unfortunately, the pedagogy of multi-grade teaching which is vastly different from teaching a single class is given scant importance during the in-service as well as pre-service training programmes.

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[17] Contract and para teachers usually have less education (though significant youth unemployment in countries like India often means they are no less qualified than regular teachers), are paid a fraction of what regular teachers are paid, and are generally on fixed-term contracts with varied renewability terms.

[18] Chatterjee, Jayanta (2012), Primary and secondary education reform should be the top priority for India, Current Science, Vol.103,No.4 (25 August 2012), https://www.jstor.org/stable/24085080(accessed on 10/06/2020)

A lack of training does not, however, seem to be the reason behind the poor learning outcomes. Close to 80% of teachers at a primary level are trained (Muralidharan, 2013). This only reflects that the training does not seem to be effective or in line with the ground realities being faced by teachers. For instance, teachers are not trained to teach in a differentiated manner in a class where children vary considerably in ability level or where multiple-grades sit in the same class.

VI. Shortage of teachers

There is a shortage of more than 5 lakh teachers in elementary schools and 14% of government secondary schools do not meet the prescribed norm of having a minimum of six teachers (MHRD, 2016). Recruitment of additional teachers has not kept pace with the rapidly growing enrolments. In states like Bihar and Odisha, there have been no regular teacher recruitments for a long time. According to the District Information System for Education (DISE), in 2014–15, 41.5% of the 7.6 lakh "primary-only" schools in the country were staffed by only two teachers, 11.6% had only one teacher, and 0.84% did not have a teacher at all (NUEPA, 2015).

Tamil Nadu and Maharashtra are the only states to have filled up almost 95% of the sanctioned posts. Bihar and Uttar Pradesh together have more than 4.2 lakh vacant posts, with 87,781 teacher posts vacant in West Bengal, out of which 32,661 posts were to be filled by the state government and 55,120 posts were to be filled under the centrally-sponsored scheme called Sarva Shiksha Abhiyan (Kundu, 2019).

VII. Uninspiring classroom transaction

Teacher effectiveness best reflects in teaching quality in classroom itself. Over the years, various policy documents on education have been talking about the need for child-friendly classrooms. Some of the parameters for a child-friendly classroom are -students ask questions, student work is displayed in the classroom, teacher relates content to local context, students can work in small groups, where Teaching Learning Materials (TLMs) other than textbook are used (NCF, 2005).

In a study of 1700 classrooms conducted by ASER, less than just 20% of classrooms were observed having any of these parameters. It also turns out that child-friendly classroom has a direct link to learning outcomes. Classrooms that had none of the parameters had a mean score of less than 40%, while child-friendly classrooms (qualified on more than three parameters) had a mean score of 55% (ASER, 2009). The standard of actual teaching in the classroom falls far below acceptable measures and goals laid out.

VIII. Poor pedagogic practices

Differences in how teachers engage their students appear to be the single biggest factor determining student learning (Beteille and Loeb 2009). In India, where schools serve hundreds of millions of low-income students, the importance of teaching practices cannot be overstated. A critical component of the effort to produce effective teaching is to understand what teachers do in the average classroom, the materials available to them, and classroom practices that get in the way of effective teaching and learning.

In classrooms, students are exposed to fewer instructional hours than planned. Sankar (2009) found that depending on the state, 12.5 to 16.5 percent of a school's functional day is lost from academic activity, and even when teaching takes place, it tends to be didactic, primarily emphasizing teachercentric activities and repetitive learning. Very little class time is devoted to such activities as engaging pupils in discussion and listening to them. Poor pedagogic practices are especially obvious in early-grade reading classes. Jhingran (2012) attributes poor reading achievement to poor teaching practices that focus primarily on rote learning and drill-type activities, with little attention paid to understanding content.

Whether students can learn depends significantly on how much time in the classroom is devoted to actual teaching. A study in three states in India found that teachers spend only 44-58 percent of their time on classroom activities, and most of that time is given to traditional activities, such as recitation, instruction/demonstration, and desk study - in other words, repetitive and teacher-centric activities (Dundar et al. 2014).

IX. Textbooks often lack the educative substance

Textbooks are notorious for arriving in schools late and being of substandard quality. Even if they reach the end user in reasonable shape, textbooks often lack the educative substance that reinforces higher-order problem-solving skills and critical thinking (Jhingran, 2012). They require little more than memorization of problem solutions (as in mathematics) and little engagement with real-life problems. Thus, far from discouraging a culture of rote learning, textbooks in general reinforce it. Students, especially those from poor and marginalised communities, are often unable to relate to the reality depicted in textbooks.

In general, classrooms make very little use of other supplementary instructional materials, often because schools do not receive funds early enough to purchase them. For example, most schools in seven Indian states received grants to purchase teaching materials six months into the school calendar year (Dongre, Chowdhury, and Aiyar, 2012, as cited in Dundar et al. 2014).

X. Missing teacher accountability

In India as also in South Asia, the problem often is not low-quality teaching but no teaching at all. Low teacher effort, as measured by high absenteeism, is a fundamental barrier to student learning (Dundar et al. 2014). Teacher absence has immediate consequences for learning - it increases unplanned multi-grade teaching and reduces the stability of the teacher-taught match, which can deeply depress child learning levels (Kingdon and Banerji, 2009). It also appears to engender inequity in educational access and outcomes (Clotfelter, Ladd, and Vigdor 2006; Miller, Murnane, and Willett 2007, as cited in Dundar et al. 2014). Each additional increase of 5 percent in teacher absence has the effect of lowering student learning outcomes by a remarkable 4–8 percent over an academic year (Das et al. 2007).

In the early 2000s, the World Bank National Absence Survey of teaching and health personnel in seven developing countries found that median teacher absence was as high as 25 percent in India, with some teachers reportedly absent 40 percent of the time. A recent study by Azim Premji Foundation has recorded the overall teacher absence in India as 18.9%[19], which directly impacts learning outcomes. Rather than being caused by a small minority of teachers, absenteeism appears to be a system-wide problem (Chaudhury et al. 2006).

XI. Lack of teacher motivation

Teacher motivation also has an impact on effectiveness and learning outcomes. Unfortunately, teacher motivation in government elementary schools is low because of lack of accountability, appreciation, and existence of non-teaching duties such as census survey, election duties etc. According to the Planning Commission's Evaluation Report on SSA, 76% of urban teachers expressed disinterest in non-teaching activities. All these factors contribute to lack of teacher effectiveness, which in turn impacts learning outcomes.

Ramachandran et al (2006) found the most dismal picture in schools with only two teachers and lots of children. Teachers could not cope with the situation and had simply given up. There were teachers who were indifferent to the children and did not really care if they learnt to read and write. They simply promoted children, maintained records and did what they were asked to do.

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[19] Madhavan, Anish (2017),India's Absent Teachers: Not As Big A Problem As We Think, IndiaSpend, https://archive.indiaspend.com/cover-story/indias-absent-teachers-not-as-big-a-problem-as-we-think-20536# .

XII. Shaky monitoring of learning outcomes

Though most education systems recognize learning as a central goal, it often receives less prominence than other objectives. This in turn, results in monitoring of learning outcomes (other than regular exams and classroom assessments) either getting neglected or becoming an irregular exercise. Assessment is a key component of learning because it helps students learn. When students can see how they are doing in a class, they are able to determine whether they have acquired skills in terms of curriculum objectives. In recent years, some state governments, such as, Delhi and Madhya Pradesh, have regularly been assessing the learning outcomes of school children, which have largely shown positive trends, but most state governments have yet to follow the suit.

At the All-India level, periodic National Achievement Surveys are mainly conducted by NCERT, a government agency. Since the early 2000s, nongovernmental organizations (NGOs) have also been carrying out large-scale, systemwide assessments. However, the country is hesitant to adopt large scale international assessments, as findings of poor student achievement perhaps hurt national pride and self-esteem. Examples of this include India's decision not to participate in future PISA tests for at least ten years, after it ranked 73rd out of 74 countries in the 2011 PISA test (Kingdon et al. 2014) On the other hand, by participating in large-scale international assessment exercises, such as TIMSS, PIRLS, and PISA; many middle-income countries, including Mexico and Brazil, have significantly benefited from such assessments to improve learning outcomes (Dundar et al. 2014).

XIII. Language barriers

Another factor that contributes to children falling behind is the language barriers that often exist between teachers and students when teachers are not from the local area. When children struggle to understand the language in which they are being taught, it becomes very difficult for them to grasp concepts in that language, and their attention wanes, which in turn shows in low learning outcomes. It is well-established that students learn best, especially in their early years, when they are taught in the language in which they are most comfortable (MHRD, 2019).

XIV. Lower community participation

Community participation in monitoring school performance is crucial for ensure accountability, which in turn ensures learning outcomes of children. Without active involvement of the community in school management, quality improvement is not possible (MHRD, n.d.). To this end, the Government of India mandates SMC or Village Education Committees (VEC) in every school. These committees are supposed to encourage communities to participate and assume ownership of the education system, which would ostensibly increase accountability.

A randomised evaluation (Pandey, Goyal, and Sundararamen, 2011) looking at the impact of community participation on student test scores in three states has found a consistent and significant increase in learning outcomes, although mainly in mathematics. Teachers were more likely to be present and teaching, especially civil service teachers with permanent jobs.

One of the functions of SMCs or VECs is to monitor academic progress of students. However, community faces substantial constraints in participating to improve the public education system, even when they care about education and are willing to do something to improve it (Banerjee et al. 2010). There is also evidence to suggest unequal relations between teachers and community members, which explains, at least in part, why community participation in monitoring education has apparently not been effective, so far. Many studies have shown that SMC and VEC seldom perform their mandated roles and many engage in corrupt practices (Sharma, 2014).

4.1 Comparative Overview of States

Although ASER does not analyse the causes of poor or improved learning levels, but it is natural to correlate changes with probable causes. Passage and implementation of the Right to Education Act in the 2009-10 period has to be correlated with the decline of subsequent reading ability at the national level and in most states (ASER 2018). Between the period 2010 and 2016, emphasis on learning outcomes was not clear. This is apparent in the mixed bag of improvement, decline or status quo in state level results over that period. Over the last two years, however, many states have shown big changes, indicative of a change of emphasis towards improved learning outcomes. One can only hope that this emphasis continues regardless of changes of officials and/or political parties in different states and at the national level.

Table 8: Learning Outcome Index for Std.3 Children (LOI3) (%)					
	2010	**2012**	**2014**	**2016**	**2018**
India	23.24	20.48	20.61	21.95	23.09
Group-1 (High LOI3)					
Kerala	52.21	38.30	37.93	40.97	47.35
Haryana	30.64	30.46	36.10	39.06	39.81
Himachal Pradesh	38.13	35.95	40.74	42.76	39.78
Punjab	31.14	38.00	35.07	36.76	39.10
Mizoram	38.56	32.84	33.57	18.88	35.88
Manipur	30.42	35.31	36.29	35.57	35.65
Sikkim	26.55	31.80	22.91		31.94
Maharashtra	33.62	27.74	23.47	29.44	31.55
Odisha	24.14	22.72	26.67	29.49	28.85
Group-2 (Mid LOI3)					
Uttarakhand	24.34	26.69	25.31	31.39	28.71
West Bengal	28.24	22.66	26.40	27.51	28.50
Gujarat	17.04	15.84	16.18	19.6	27.77
Andhra Pradesh	28.45	33.01	28.52	30.69	27.11
Tripura	28.66	20.74	28.39	29.75	27.06
Nagaland	22.29	30.74	18.69	24.57	26.17
Jammu & Kashmir		29.28	24.76		25.95
Telangana			24.72	26.37	23.70
Arunachal Pradesh	19.45	28.48	18.40	18.11	22.57
Group-3 (Low LOI3)					
Chhattisgarh	17.54	15.45	16.19	21.53	22.44
Assam	21.17	15.59	16.00	20.15	21.30
Karnataka	21.65	25.02	20.96	22.25	21.15
Meghalaya	21.55	27.37	25.49	20.23	21.10
Uttar Pradesh	16.55	15.23	18.40	17.81	20.67
Bihar	24.78	17.68	15.76	16.34	18.07
Jharkhand	17.16	14.98	13.49	14.25	16.11
Tamil Nadu	10.86	11.49	19.08	20.22	15.97
Rajasthan	18.42	15.6	18.01	18.60	15.90
Madhya Pradesh		10.51	10.70	12.62	13.13

Note: ASER data for Sikkim (2016), J & K (2010, 2016), Telangana (2010, 2012) and Madhya Pradesh (2010) not available

In terms of values of Learning Outcome Index for Std.3 level rural children (LOI3) in 2018, **Table 8** has divided major states of India into three groups – states with high LOI3, states with mid LOI3 and states with low LOI3. It is easy to see how each state has behaved over the years. There is clearly a positive change in most states over the last two years. This change points towards an increased emphasis on improved learning levels in many states. It will be worthwhile watching if the trend of positive change continues in most states and the productivity of the system reaches and then overtakes where it was in 2010.

Between the period 2010 and 2018, learning outcome index at the all-India level marginally decreased by 0.15 percentage points (from 23.24% to 23.09%). Gujarat (10.7 percentage points), Haryana (9.17 percentage points) and Punjab (7.96 percentage points) recorded the highest increase. Odisha (4.71 percentage points), Uttarakhand (4.37 percentage points), and Uttar Pradesh (4.12 percentage points), followed by Nagaland (3.88 percentage points), Andhra Pradesh (3.12 percentage points), and Himachal Pradesh (1.65 percentage points) marked a modest increase, while Bihar (-6.71 percentage points), Kerala (-4.86 percentage points), and Mizoram (-2.68 percentage points) have shown the loudest decline.

Table 9 indicates a list of factors and interventions in a few high, mid and low performing states to analyse plausible reasons for the state of learning outcomes of their children.

Interventions aimed at increased access and awareness of quality education and constant monitoring of efforts are plausible reasons for states such as Kerala and Haryana ranking at the top. There is increased focus on regular monitoring and evaluation for corrective action and personalised learning for both students and teachers. Under its Saksham' programme, there is a renewed vigour in the air to learn and learn well in Haryana[20].

In Uttarakhand, efforts have been made to improve infrastructural gaps in schools, develop conducive environment for learning and motivate community to take ownership of schools. Smart Class Maths and English Kits are provided to schools for joyful learning, while monthly test are conducted for achievement tracking[21]. In Andhra Pradesh, a strategic school transformation programme called 'Badi Parivartana', based on community learning and focused on tech-enabled learning and digital literacy, was implemented in government schools in 2017. To address the learning gaps, a state-wide summer remedial programme called Gyana Dhara was initiated in 2018.

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[20] Shruti Kheda (2019), How Haryana transformed dismal student learning outcomes in its government schools, https://yourstory.com/socialstory/2019/02/haryana-transformed-student-learning (accessed on 10/06/2019)

[21] Minutes of the meeting of the Project Approval Board held on 8th May 2019 to consider the Annual Work Plan & Budget (AWP&B) 2019-20 of Samagra Shiksha for the state of Uttarakhand, Ministry of Human Resource Development, Government of India

Performance in LOI3	State	Key characeristics and recent interventions
High	Kerala	• Concerted efforts being made by the government to protect public education. • Special training and orientation classes, special classes and workshops organised to help the below average students improve their academic standards under the Shradha project. • Madhuram Malayalam initiative aimed at improving the learning and speaking efficiency in Malayalam language. • Surili Hindi rolled out for improving Hindi learning in all upper primary schools while Ganitham Vijayam targeted students who wanted support in improving their skills in Mathematics. • The school curriculum given a push by helping the bright students seek new areas of knowledge while aiding the below average students through programmes to boost their learning outcomes. • Good governance processes aiding outcomes that include indicators related to student and teacher attendance systems, availability of in-service teacher professional development, school leadership, accountability, transparency in teacher recruitment and financial discipline
High	Himachal Pradesh	• Government prioritised education with spending 7.8% of GSDP on education in comparison to only 2.87% by Punjab, 3.25% by Kerala and 3.6% at the national level till the year 2001. Budget expenditure on education continues to be high even now. • The Education Guarantee Scheme achieved great results; promoted an inclusive model of education with mobile schools for migratory Gujjar populations, with special focus on remote tribal districts like Kinnaur and Spiti, home-schooling for disabled children and identification of children with special needs. • Implementation of 'Prerna Plus' and 'Prayas Plus' schemes specifically aiming at enhancement in the learning outcome of students of Classes I to V and Classes VI to VIII. • With the use of mobile-based TheTeacherApp, teacher training has gone digital. Approximately 40,000 elementary school teachers are trained every year by the state's Department of Elementary Education (DEE). • Government using an in-house smart assessment dashboard, called 'Samarth Assessment Dashboard', to collect, digitise, and analyse assessment data.

Table 9: Key Interventions in Select High, Mid and Low Performing States

Mid	West Bengal	• Introduction of books in first language, which is Bengali • Equal emphasis on elementary and secondary education in the budget • Lack of infrastructure, drinking water, toilet facilities and electricity, which in turn lead to fall in the interest of the students to come to school • Shikshashree and Kanyashree are schemes that provide financial aid and conditional cash transfers to Scheduled Caste students to pursue secondary education
Mid	Gujarat	• Gunotsav: This is an appraisal scheme for government-funded schools to ensure that each school gets what it needs in order to improve quality. Each school assesses itself on prescribed parameters. • Extra coaching programme: These are three-month programmes with four periodic assessments, built-in formative evaluation that would help teachers monitor the progress of each child. Children are grouped according to their competency, irrespective of classes they belonged to. Activity-based approach, using existing teaching learning material is utilised. There is involvement of parents through three PTA meetings a year, and visiting students who have been absent for three consecutive days. Head teachers guide volunteer teachers in the programme. There is clear role definition and monitoring through Cluster Resource Centre (CRC) and Block Resource Centre (BRC).
Low	Chhattisgarh	• Schemes like Dakshata Abhiyan and porta cabins are aimed at increasing access to students from marginalised communities • Under Muskaan Pustakalaya Yojana, free of cost/cheap books/audio books provided to students • Under the Sampark Smart Class Programme, basic mathematics and English are inculcated in early classes via audio, video and 3D learning aids.
Low	Rajasthan	• One Aadarsh School (model school) in all 9,894 GramPanchayats to be catalysts of education reform providing the right mentoship and support to other schools in vincity and improving education service delivery in the entire village. To support this vision, local governance structures being streamlined by the appointment of Panchayat Elementary Education Officer in every Gram Panchayat. • Along with school education, the state is integrating Anganwadis across the primary scholls for strengthening of pre-primary education in the Gram Panchayat • The state has adopted Continuous Comprehensive Evaluation (CCE) as a pedagogical tool and carefully scaled up its adoption in schools. This has ensured that ongoing evaluation was able to address gaps in learning.

RECOMMENDATIONS AND CONCLUSION

5.1 RECOMMENDATIONS

1. Supportive learning environment

i. Promote supportive learning environment at home through improved living standards of people, especially those from poor and marginalised communities. It is a long overall, but poverty alleviation efforts, including employment generation, and livelihood support to the masses, must be sustained till all Indian families, rural or urban, are out of the poverty cycle, and have regular income in their hands.

ii. Educate parents on the value of education, early stimulation and home support to children, learning needs, opportunities for learning at home (starting from birth) to improve language and motor development, etc. to get rid of the intergenerational inequities resulting in low student achievements.

2. Build stronger education-nutrition nexus

i. Anganwadi Centres under the Integrated Child Development Scheme (ICDS) must do more to provide adequate nutritional support to children through a balanced diet, supplements and physical activities.

ii. Mid-day meals in schools are an important food safety measure for children from disadvantaged and poor households. There is a need to modify the scheme to create entitlement of mid-day meals for school children even during vacations. There is also a need for a more robust monitoring of mid-day meals to ensure quality and dietary stipulations.

3. Preschooling a must for children

i. Expand pre-schools/Anganwadi centres by improving their scope, implementation capacity and efficiency.to provide children with basic foundations before the start of primary school and to socialize them and their parents to school early. Enrolment in preschools be enhanced for cent-percent coverage.

ii. Reinforce the existing preschools by improving their scope, implementation capacity, and efficiency. Services of preschools/ Anganwadi Centres be improved by a dedicated preschool teacher for early education, which would allow Anganwadi workers to focus

more on nutrition for younger children. Pre-school workers may receive specialized training in preparing children for primary education. Private centres and other NGO activities be given a greater role in preschool programmes.

4. Improve quality of teachers

i.   Subject knowledge is central to teacher quality or competence. Hence, pre-service training needs to equip teachers with relevant, up-to-date knowledge and practice in dynamic approaches to teaching. Wherever teachers lack skills and content knowledge, carefully designed in-service training is essential if they are to be effective.

ii. Recruitment needs to be directed to hiring teachers with the requisite knowledge and teaching skills, with safeguards put in place to prevent decisions about appointments, transfers, and promotions that are not based on merit.

iii. There is a need for clear regulations governing deployment of teachers. This is of particular concern in rural areas where teachers typically deal with poorer health care, lower rent allowances, and isolation.

5. Make teacher training effective

i.   Teacher training be redefined, benchmarking it to global standards, and adopting a national framework. Strengthening and equipping Block Institutes of Teacher Education and District Institutes of Education and Training would help building knowledge networks. For early grades, teacher training be redesigned for foundational literacy and numeracy.

ii. Pre-service training needs to equip teachers with dynamic knowledge and approaches to teaching, and recruitment policies need to be directed to individuals with knowledge and teaching skills. Where there are gaps in skills and content knowledge, carefully designed in-service training be introduced.

iii. For continuous professional development of teachers, up-skilling every two-three years be made mandatory through short online courses and practices, such as, co-teaching, teacher mentoring, teacher reflection, etc.

iv. Capacity of elementary school teachers be strengthened through a teacher training repository comprising of a series of videos demonstrating best teaching for practices classrooms.

v.   Cross-pollination of best practices be encouraged in schools across subjects and grades so that changes are better adapted to and universalised.

6. Rationalise recruitment and deployment of teachers

i. To recruit competent teachers, education professionals be offered pay packages and working conditions on a par with other professions. Simultaneously, to retain teachers, school managements must invest in continuous in-service training and offer opportunities for professional growth.

ii. In rural areas, special merit-scholarships be established that also include guaranteed employment in local areas upon successful completion of B.Ed. programmes. Such scholarships with guaranteed employment may provide local job opportunities to outstanding local students, including female students.

iii. To encourage competent teachers to be deployed to rural areas, incentives be provided for teachers to take up teaching jobs in rural areas with teacher shortages.

7. Support child-friendly classrooms

i. To improve the learning environment in schools, standard practices for child-friendly classrooms, where children enjoy and learn through activities, are encouraged to express their opinion, and teachers try to adjust the standard curriculum to the learning needs of children, be implemented on the grounds.

ii. Teacher attitudes towards child friendly and inclusive education can be altered with training and support. All teacher trainings be made a central part of encouraging a child-friendly and inclusive school environment.

iii. Classroom practices and surrounding environment be strengthened by training teachers in the specialised skill of teaching to read, and a print rich environment with lots of posters and reading material.

8. Promote innovative pedagogies

i. There is a need to recognise innovative pedagogies that have positive impact in the classroom, so that children move away from rote learning and a spirit of enquiry and understanding is encouraged. For the change to happen, a callout for action could involve participation from change agents like governments and nodal agencies, schools, teachers, parents and the education communities.

ii. Innovative and cross-cultural pedagogies involving teaching with the aid of IT material, integration of arts and sports, assessment of the student, querying, and augmentation be promoted to instil learning retention among children. NCERT needs to revisit its pedagogy and curricular formulations in the process of 'teacher-preparation' as well as motivation of the teachers.

iii. Spaces for collaboration, such as, teacher to teacher, peer groups, local circles need to be created, wherever possible, for enhancement of professional and technical competencies, innovative pedagogical practices, and more.

iv. Overall, an environment of support needs to be created for the teachers where continuous feedback is taken from them and a corrective action plan is devised to help them in the classroom.

9. Reorient curriculum

i. The entire school education curriculum be reoriented to develop holistic learners and develop in learners higher order skills of critical thinking, creativity, logical deduction, collaboration, social responsibility, quantitative reasoning, and digital literacy.

ii. Overcrowded curriculum content be reduced in favour of a more engaging, experiential, and analysis-based form of learning. It is good that the recent National Education Policy 2020 also talks of reducing curriculum content to enhance essential learning and critical thinking. Timely implementation must be the next challenge.

iii. Concepts be built up in alignment with the environment, geography and context, by understanding the psychology of children and creating experiences that they can relate to. In other words, solutions should be contextualised based on the community and geographic needs since each state has a unique growth trajectory and distinctive communities.

10. Make teacher more accountable

i. To ensure professional integrity, teachers be made accountable to students, their parents, the community and the public at large for what they are doing or not doing for education in schools. While ensuring autonomy and empowerment of all teachers, the accountability mechanism must have clear non-negotiables in effecting improvements. Teacher absenteeism may be reduced with adequate monitoring.

ii. Clearly laid out professional standards be developed for career progression of teachers, including performance appraisal, professional development, salary increases, promotions, etc. Performance appraisal may include both non-negotiable hard indicators (regular attendance, financial propriety, etc.) and soft indicators (effective pedagogy and classroom practices, effective assessment of progress of students, effective use of TLMs, etc).

11. Expand teacher motivation

i. Teachers' Needs Assessment be conducted to understand teachers' motivation. Incentivising teachers based on increase in students' test scores can lead to improved learning outcomes. Performance bonuses are a productivity-enhancing measure, which improves the effectiveness of human capital.

ii. The harmful practice of excessive teacher transfers be stopped with immediate effect. It will ensure that teachers can build relationships with and become invested in their communities, and students have a continuity in their role models. Transfers be allowed only in special circumstances.

iii. Teachers be given more autonomy to choose finer aspects of curriculum and pedagogy, so that they may teach in the manner they find most effective for students in classrooms and communities.

iv. An incentive structure with a promotion-and-salary ladder be put in place to mark achievements in the profession.

12. Monitor learning outcomes at scale

i. Large-scale assessment systems along with robust investment support be introduced to monitor progress in learning outcomes and improvements in schooling quality over time.

ii. Assessments need to cover students in both government and private schools and should be designed in a manner that does not pressure students unduly. Students be assessed on concepts and competencies that they have continuously been engaged in. Analysis of assessments also be mandated, so that the same feeds back into classroom processes.

iii. National learning outcomes should also be benchmarked against regional and international learning standards to identify specific areas of relative weakness and create the political imperative for school quality reform.

13. Mother tongue-based bi/multi-lingual education

i. Classes in early years (at least until Grade 5) be conducted in students' home languages/ mother tongues. It is good that the National Education Policy 2020 supports this approach, wherever possible. However, mother tongue-based education should be mandatory in early grades, and not just 'wherever possible'.

ii. Efforts also be made to establish an adequate number of schools having medium of instruction catering to significant linguistic minorities in that region.

iii. National Education Policy (2020) talks of encouraging teachers to use a bi/multi-lingual approach, including bi/multi-lingual teaching-learning materials, with those students whose home language may be different from the medium of instruction to ensure smoother transition from the home language to the medium of instruction. It should be implemented by letter and spirit.

iv. To meet the requirements of mother tongue-based bi/multilingual education, recruitment and deployment of local teachers well versed with local languages and cultural context be encouraged.

v. Since children learn languages most quickly in early grades, and multilingualism has great cognitive benefits for children, students be exposed to three languages early on, from the Foundational Stage itself.

14. Capacitate community to participate

i. Community participation though School Management Committees (SMCs) be encouraged for a more robust and improved school governance, monitoring, oversight, and initiatives by local stakeholders.

ii. Since community doesn't have the capacity to participate, it needs capacitation first. To make community participation effective, SMC members should be given specific tasks and training.

iii. Involvement of community in recruitment and deployment of teachers be encouraged for selection of good teachers as per their need. The teacher selected by the community shows the responsibility towards the children of the community.

iv. Role of community in pedagogical supervision and support should also be explored.

5.2 CONCLUSION

Learning outcomes, which were already in decline before the introduction of the RTE in 2010, have gone down further. Nationally, the decline accelerated between 2010 and 2014 but there's a mixed pattern if it is analysed at state level. Except for a very marginal average growth rate (0.11%) in Learning Outcome Index for Std.8 level children (LOI_8), the all-India average growth rate of Learning Outcome Indices for Std.3 and 5 level children (LOI_3 and LOI_5) have marked a fall of 6.43% and 3.15%, respectively, overtime. The causes behind low learning outcomes have not been fully examined yet. However, issues of teaching learning and teaching capability need to be assessed in the light of low learning outcomes of children in elementary schools.

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APPENDIX

	Table 1: The Values of Learning Outcome Index – Std.3 (LOI3) for Different States (%)					
SN	State	LOI3 (2010)	LOI3 (2012)	LOI3 (2014)	LOI3 (2016)	LOI3 (2018)
1	Andhra Pradesh	28.45	33.01	28.52	30.69	27.11
2	Arunachal Pradesh	19.45	28.48	18.40	18.11	22.57
3	Assam	21.17	15.59	16.00	20.15	21.30
4	Bihar	24.78	17.68	15.76	16.34	18.07
5	Chhattisgarh	17.54	15.45	16.19	21.53	22.44
6	Gujarat	17.04	15.84	16.18	19.6	27.77
7	Haryana	30.64	30.46	36.10	39.06	39.81
8	Himachal Pradesh	38.13	35.95	40.74	42.76	39.78
9	Jammu & Kashmir		29.28	24.76		25.95
10	Jharkhand	17.16	14.98	13.49	14.25	16.11
11	Karnataka	21.65	25.02	20.96	22.25	21.15
12	Kerala	52.21	38.30	37.93	40.97	47.35
13	Madhya Pradesh		10.51	10.70	12.62	13.13
14	Maharashtra	33.62	27.74	23.47	29.44	31.55
15	Manipur	30.42	35.31	36.29	35.57	35.65
16	Meghalaya	21.55	27.37	25.49	20.23	21.10
17	Mizoram	38.56	32.84	33.57	18.88	35.88
18	Nagaland	22.29	30.74	18.69	24.57	26.17
19	Odisha	24.14	22.72	26.67	29.49	28.85
20	Punjab	31.14	38.00	35.07	36.76	39.10
21	Rajasthan	18.42	15.6	18.01	18.60	15.90
22	Sikkim	26.55	31.80	22.91		31.94
23	Tamil Nadu	10.86	11.49	19.08	20.22	15.97
24	Telangana			24.72	26.37	23.70
25	Tripura	28.66	20.74	28.39	29.75	27.06
26	Uttar Pradesh	16.55	15.23	18.40	17.81	20.67
27	**Uttarakhand**	24.34	26.69	25.31	31.39	28.71
28	West Bengal	28.24	22.66	26.40	27.51	28.50
	All India	**23.24**	**20.48**	**20.61**	**21.95**	**23.09**

SN	State	LOI5 (2010)	LOI5 (2012)	LOI5 (2014)	LOI5 (2016)	LOI5 (2018)
	Table 2: The Values of Learning Outcome Index – Std.5 (LOI5) for Different States (%)					
1	Andhra Pradesh	49.42	49.41	46.46	45.27	48.44
2	Arunachal Pradesh	36.36	48.12	39.87	22.01	31.82
3	Assam	33.96	20.34	19.80	22.73	26.72
4	Bihar	54.99	37.34	40.91	37.00	35.14
5	Chhattisgarh	49.01	25.50	30.71	35.86	39.93
6	Gujarat	30.98	25.72	27.39	29.21	32.85
7	Haryana	62.79	50.65	59.39	57.79	59.31
8	Himachal Pradesh	70.00	59.54	59.32	61.53	65.97
9	Jammu & Kashmir		29.27	31.04		32.43
10	Jharkhand	45.09	30.24	27.07	29.25	25.63
11	Karnataka	30.00	31.07	30.80	28.80	30.71
12	Kerala	60.81	54.71	51.11	51.68	58.08
13	Madhya Pradesh		20.18	21.77	27.40	28.70
14	Maharashtra	55.01	36.30	31.80	35.62	44.78
15	Manipur	52.15	53.32	60.36	60.92	58.38
16	Meghalaya	50.21	34.57	25.67	22.64	18.99
17	Mizoram	66.86	50.92	45.65	35.70	50.84
18	Nagaland	43.70	42.66	32.63	32.59	35.19
19	Odisha	38.49	29.33	33.94	37.05	38.51
20	Punjab	69.75	60.89	54.34	57.59	61.60
21	Rajasthan	40.94	31.46	33.20	39.06	33.82
22	Sikkim	45.67	51.94	38.02		22.83
23	Tamil Nadu	21.42	19.72	34.79	31.10	32.15
24	Telangana			42.86	37.84	34.41
25	Tripura	38.27	27.67	31.85	31.86	29.39
26	Uttar Pradesh	33.20	30.02	33.89	31.25	39.30
27	Uttarakhand	58.21	45.21	42.78	48.55	49.10
28	West Bengal	45.08	37.26	41.58	38.15	38.80
	All India	**43.78**	**34.07**	**35.43**	**35.19**	**37.39**

SN	State	LOI8 (2010)	LOI8 (2012)	LOI8 (2014)	LOI8 (2016)	LOI8 (2018)
	Table 3: The Values of Learning Outcome Index – Std.8 (LOI8) for Different States (%)					
1	Andhra Pradesh	77.28	75.72	67.84	62.68	61.01
2	Arunachal Pradesh	76.43	83.15	65.9	61.48	59.43
3	Assam	63.69	45.78	39.52	42.65	43.55
4	Bihar	86.4	73.58	68.68	68.4	63.65
5	Chhattisgarh	84.92	49.33	47.51	45.45	49.39
6	Gujarat	65.45	57.8	50.3	51.63	51.05
7	Haryana	85.42	76.64	75.43	73.99	71.64
8	Himachal Pradesh	89.22	80.43	75.36	72.14	74.05
9	Jammu & Kashmir		48.8	49.97		46.17
10	Jharkhand	82.04	65.96	59.92	53.89	54.05
11	Karnataka	57.66	58.64	51.11	54.35	52.36
12	Kerala	84.57	79.51	72.61	67.24	68.13
13	Madhya Pradesh		48.64	44.58	46.34	48.55
14	Maharashtra	82.31	60.78	50.17	48.86	56.99
15	Manipur	85.82	79.4	80.11	84.76	79.19
16	Meghalaya	86.82	62.44	65.47	51.9	48.24
17	Mizoram	87.76	90.16	84.14	79.92	79.67
18	Nagaland	86.89	85.08	79.62	76.04	65.49
19	Odisha	70.78	56.04	53.32	53.62	55.55
20	Punjab	85.1	74.2	72.99	70.85	72.87
21	Rajasthan	80.02	59.12	62.36	61.47	57.07
22	Sikkim	89.66	85.5	75.9		59.36
23	Tamil Nadu	57.88	49.38	53.95	56.4	60.62
24	Telangana			57.57	64.63	57.73
25	Tripura	70.87	53.09	58.07	49.45	45.79
26	Uttar Pradesh	66.04	50.4	55.62	50.39	57.2
27	Uttarakhand	87.35	69.4	62.27	61.15	63.82
28	West Bengal	74.96	57.04	55.09	47.81	42.11
	All India	**74.75**	**60.62**	**57.36**	**56.16**	**56.53**

	Table 4: Ranking of States by LOI3 for Standard 3 Level Children (2010-2018)					
SN	State	LOI3 (2010)	LOI3 (2012)	LOI3 (2014)	LOI3 (2016)	LOI3 (2018)
1	Andhra Pradesh	9	5	7	7	13
2	Arunachal Pradesh	19	11	20	22	18
3	Assam	18	22	25	18	20
4	Bihar	12	19	26	24	24
5	Chhattisgarh	21	23	23	15	19
6	Gujarat	23	20	24	19	12
7	Haryana	6	9	4	3	2
8	Himachal Pradesh	3	3	1	1	3
9	Jammu & Kashmir		10	13		16
10	Jharkhand	22	25	27	25	25
11	Karnataka	16	15	17	14	21
12	Kerala	1	1	2	2	1
13	Madhya Pradesh		27	28	26	28
14	Maharashtra	4	12	15	10	8
15	Manipur	7	4	3	5	6
16	Meghalaya	17	13	11	16	22
17	Mizoram	2	6	6	20	5
18	Nagaland	15	8	19	13	15
19	Odisha	14	16	9	9	9
20	Punjab	5	2	5	4	4
21	Rajasthan	20	21	22	21	27
22	Sikkim	11	7	16		7
23	Tamil Nadu	25	26	18	17	26
24	Telangana			14	12	17
25	Tripura	8	18	8	8	14
26	Uttar Pradesh	24	24	21	23	23
27	Uttarakhand	13	14	12	6	10
28	West Bengal	10	17	10	11	11

SN	State	LOI5 (2010)	LOI5 (2012)	LOI5 (2014)	LOI5 (2016)	LOI5 (2018)
		Table 5: Ranking of States by LOI5 for Standard 5 Level Children (2010-2018)				
1	Andhra Pradesh	11	8	6	7	8
2	Arunachal Pradesh	20	9	12	26	21
3	Assam	21	25	28	24	25
4	Bihar	8	12	11	12	15
5	Chhattisgarh	12	24	23	13	10
6	Gujarat	23	23	24	21	18
7	Haryana	4	7	2	3	3
8	Himachal Pradesh	1	2	3	1	1
9	Jammu & Kashmir		21	21		19
10	Jharkhand	14	18	25	20	26
11	Karnataka	24	17	22	22	22
12	Kerala	5	3	5	5	5
13	Madhya Pradesh		26	27	23	24
14	Maharashtra	7	14	20	15	9
15	Manipur	9	4	1	2	4
16	Meghalaya	10	15	26	25	28
17	Mizoram	3	6	7	14	6
18	Nagaland	16	11	18	16	14
19	Odisha	18	20	15	11	13
20	Punjab	2	1	4	4	2
21	Rajasthan	17	16	17	8	17
22	Sikkim	13	5	13		27
23	Tamil Nadu	25	27	14	19	20
24	Telangana			8	10	16
25	Tripura	19	22	19	17	23
26	Uttar Pradesh	22	19	16	18	11
27	Uttarakhand	6	10	9	6	7
28	West Bengal	15	13	10	9	12

SN	State	LOI8 (2010)	LOI8 (2012)	LOI8 (2014)	LOI8 (2016)	LOI8 (2018)
	Table 6: Ranking of States by LOI8 for Standard 8 Level Children (2010-2018)					
1	Andhra Pradesh	16	9	10	10	10
2	Arunachal Pradesh	17	4	11	11	12
3	Assam	23	27	28	26	27
4	Bihar	7	11	9	7	9
5	Chhattisgarh	11	24	26	25	22
6	Gujarat	22	18	23	19	21
7	Haryana	9	8	5	4	5
8	Himachal Pradesh	2	5	6	5	3
9	Jammu & Kashmir		25	25		25
10	Jharkhand	14	13	15	16	19
11	Karnataka	25	17	22	15	20
12	Kerala	12	6	8	8	6
13	Madhya Pradesh		26	27	24	23
14	Maharashtra	13	15	24	22	17
15	Manipur	8	7	2	1	2
16	Meghalaya	6	14	12	18	24
17	Mizoram	3	1	1	2	1
18	Nagaland	5	3	3	3	7
19	Odisha	20	20	21	17	18
20	Punjab	10	10	7	6	4
21	Rajasthan	15	16	13	12	16
22	Sikkim	1	2	4		13
23	Tamil Nadu	24	23	20	14	11
24	Telangana			17	9	14
25	Tripura	19	21	16	21	26
26	Uttar Pradesh	21	22	18	20	15
27	Uttarakhand	4	12	14	13	8
28	West Bengal	18	19	19	23	28

	Table 7: Average Growth Rate of Learning Outcome Index of Children (between 2010 to 2018)			
SN	State	Average Growth Rate of LOI3	Average Growth Rate of LOI5	Average Growth Rate of LOI8
1	Andhra Pradesh	-0.41	-0.39	-5.67
2	Arunachal Pradesh	8.52	3.74	-5.50
3	Assam	1.98	-2.60	-7.94
4	Bihar	-6.31	-9.28	-7.21
5	Chhattisgarh	7.52	0.15	-10.32
6	Gujarat	14.48	2.16	-5.79
7	Haryana	7.01	-0.54	-4.24
8	Himachal Pradesh	1.40	-1.09	-4.45
9	Jammu & Kashmir			
10	Jharkhand	-0.99	-11.93	-9.63
11	Karnataka	0.14	0.71	-2.12
12	Kerala	-1.01	-0.78	-5.18
13	Madhya Pradesh	7.935	12.83	0.12
14	Maharashtra	-0.07	0.93	-7.40
15	Manipur	4.27	3.05	-1.84
16	Meghalaya	0.95	-21.20	-12.75
17	Mizoram	8.42	-3.39	-2.32
18	Nagaland	9.17	-4.51	-6.72
19	Odisha	4.98	1.26	-5.38
20	Punjab	6.38	-2.63	-3.63
21	Rajasthan	-2.78	-3.35	-7.31
22	Sikkim			
23	Tamil Nadu	14.20	15.31	1.65
24	Telangana			
25	Tripura	1.25	-5.08	-9.49
26	Uttar Pradesh	6.42	5.32	-2.30
27	Uttarakhand	4.99	-3.27	-7.06
28	West Bengal	1.14	-3.07	-13.12
	All India	0.11	-3.15	-6.43

Calculations for J&K and Telangana not made due to unavailability of data for all the points of reference

* Average growth rate calculated between 2012 to 2018 only

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