Education in India

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ABSTRACT:

India is the second-most populous country after China, with a population of approximately 1.3 billion. So with a large population comes a colossal unemployment problem because the demand for skilled workers is high. In a country with a population this high, there is a high competition in the market as well. Here's where Education plays a significant role.

Our team is interested in the topic of 'Education', particularly in India, because we believe that the right education to every citizen, at least up to the age of 15, will help the whole nation in terms of economy. Proper education will increase our knowledge and scope of thinking. So this helps in enhancing the quality of human capital. The unemployment rate decreases due to the creation of jobs, so all of this together results in positive GDP growth and India's dream of seeing itself in the top 10 countries in the world can also be satisfied.

Our project focuses on the Literacy rate, Dropout rate and Gross Enrolment Ratio(GER), as in how many children, of age 15 and below, are enrolling to schools, across India. We are using the most recent data available to us from the DISE site for 2016-17. The data contains a lot of information about schools, of all states, like the population in a particular district, sex ratio, male and female literacy rate, playground, electricity facility in the schools etc. The data is categorised into, government schools, private schools and unrecognised and madrasas. It also gives details of all girls, all boys or co-education schools and the facilities available in those schools. Please note that the used factors that affect the education system are all pointed out, in the dataset provided and other factors like political influences and government changes are not taken into account in this report.

Note:

Since the data available in DISE is till the academic year 2016-17 we used the old education policy of India in this report to describe because the Indian government introduced the new education policy in 2020. After this step, prefer reading Appendix once.

Project Objectives:

i)To analyse the current situation of Indian Schools;

ii)Observing the main factors affecting the GER, Literacy rate and Dropout rate;

iii) Suggesting ideas that can affect the GER, Literacy rate positively and decrease the Dropout rate.

Data Description:

The data used in this study is from the database of the Unified District Information System for Education(DISE). The DISE site records data of Indian Schools in particular. The most recent data available on this site is the education data of the academic year 2016-2017. The data contains a lot of information about schools, of about 700 districts, like the population in a particular district, sex ratio, male and female literacy rate, percentage of SC, ST categories etc. The data is categorised into, government schools, private schools and unrecognised and madrasas. It also gives details of all girls, all boys or co-education schools and the facilities available in those schools.

Please note that the state Telangana is not considered in the data taken because the data of the Telangana state is inaccurate in many columns mentioned (maybe because of the bifurcation situation happened on 2014), and small correction of the population is

made in the West Bengal state (correction made: population mentioned in data is ten times more than the original population).

INTRODUCTION:

History of Indian Education:

The cornerstone of the ancient system of education was religion. Temples and Community Centres played the role of schools.

Later, the Gurukula system came into existence. India has a traditional way of teaching called the "Gurukula" system where students will live with the teacher in the same place and learn essential lessons for their survival. Education was considered a higher virtue in ancient India.

But India failed in its early phase of development in the 1900s in the education system because of colonial rule, inadequate policies and low financial support to the education system. After Independence, the Central Government of India took some necessary steps to enhance the learning experiences of children and provide job opportunities to the people in India in the Education sector.

Indian Education System:

1. Pre-primary level: 5-6 years of age.
2. Primary(elementary) level: 6-14 years of age.
3. Secondary level: 14-18 years of age.
4. Higher education: Under Graduation -> Post Graduation -> MPHiL/PhD.

Article 21A supports the primary level of education, under the Right to Education Act. This provides free and compulsory education to the children in the age group of six to fourteen years as a fundamental right.

Present Situation of Indian Education:

In this paragraph, let's see how well the education system in India performed.

Census Year	Persons	Decadal Increase	Males	Females	Gender gap
1951	18.33		27.16	8.86	18.30
1961	28.3	9.97	40.40	15.35	25.05
1971	34.45	6.15	45.96	21.97	23.99
1981	43.57	9.12	56.38	29.76	26.62
1991	52.21	8.64	64.13	39.29	24.84
2001	64.83	12.62	75.26	53.67	21.59
2011	74.04	9.21	82.14	65.46	16.68

After Independence in 1945, India performed decently with the literacy rate in both male and female categories. Even though the literacy rate of women seems lower than that of male's, the gender gap of literacy rate all over the country obtained in the 2011 census is the least among all other years mentioned in the census data above, which speaks for the development measures and care taken towards women empowerment in these days.

India's literacy rate is 74.04, with Kerala ranked 1st having around 96 percent literacy rate, and Bihar ranked last having approximately 60 percent literacy rate according to the census data 2011. Male literacy rate in India is 82.1 percent, and female literacy rate is 65.5 percent. Literacy rates of adults and youth have increased, but the illiterate strength is also as high as the population of India in the Independence phase. India is still lagging when compared to the world's literacy rate of 86.3 percent (UNESCO 2015). India's expenditure on education as a percentage of government

spending is around 15 percent. Though India's literacy rate increased from 1951 to 2011 the facts like improper sanitation, inexperienced teachers, the gender gap and many other factors led the pace of India's literacy rate to lower by increasing dropouts at earlier stages of education. In India, according to the census 2011, a person can be called literate if that person is aged seven and above and can both read and write with understanding in any language. A person who can only read but cannot write is not literate. Let's observe the factors that affected the literacy rate in India.

LITERATURE REVIEW:

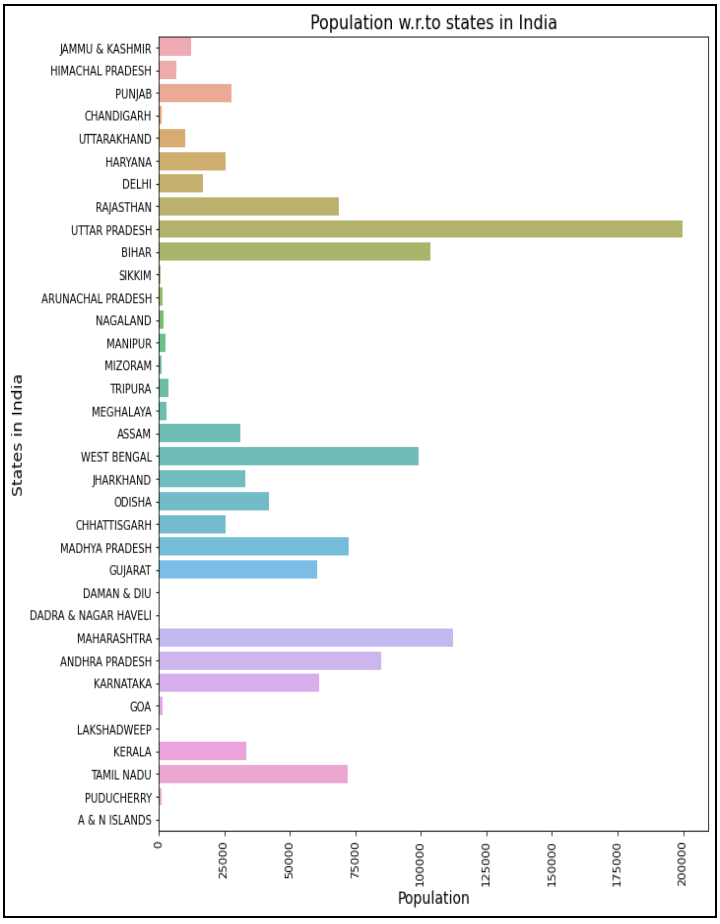
There have been numerous studies, which talk about the problems faced by Indian education due to factors such as, lack of infrastructure, absence of sanitation facilities, lack of accountability(more in case of public schools)etc. *Sahni, Sinha and Paul (2018)* talk about the impact of electrification on educational outcomes, using empirical evidence. It suggests that electrification has a positive effect on education. When it comes to the impact of sanitation on school dropouts *Burgers(2000), Kirk and Sommer(2006),* discusses how pubescent-age females drop-out from schools due to lack of sanitation facilities. *Adukia(2016)* focuses on the same issue using a national Indian school latrine-construction initiative and administrative school-level data. The paper also argues that investing in necessary infrastructure had a positive educational outcome. Here we aim to find a linkage between Gross enrollment ratio and all these factors, how it affects the rate. The focus is to quantify the effect population(including the rural-urban divide), the number of schools(private and public), infrastructure(for example electrification and sanitation) has on the Enrollment ratio. Also, it will help us to prioritise pressing needs, which can lead to increasing GER.

EMPIRICAL ANALYSIS:

Observations from the data (2016-17 Academic year):

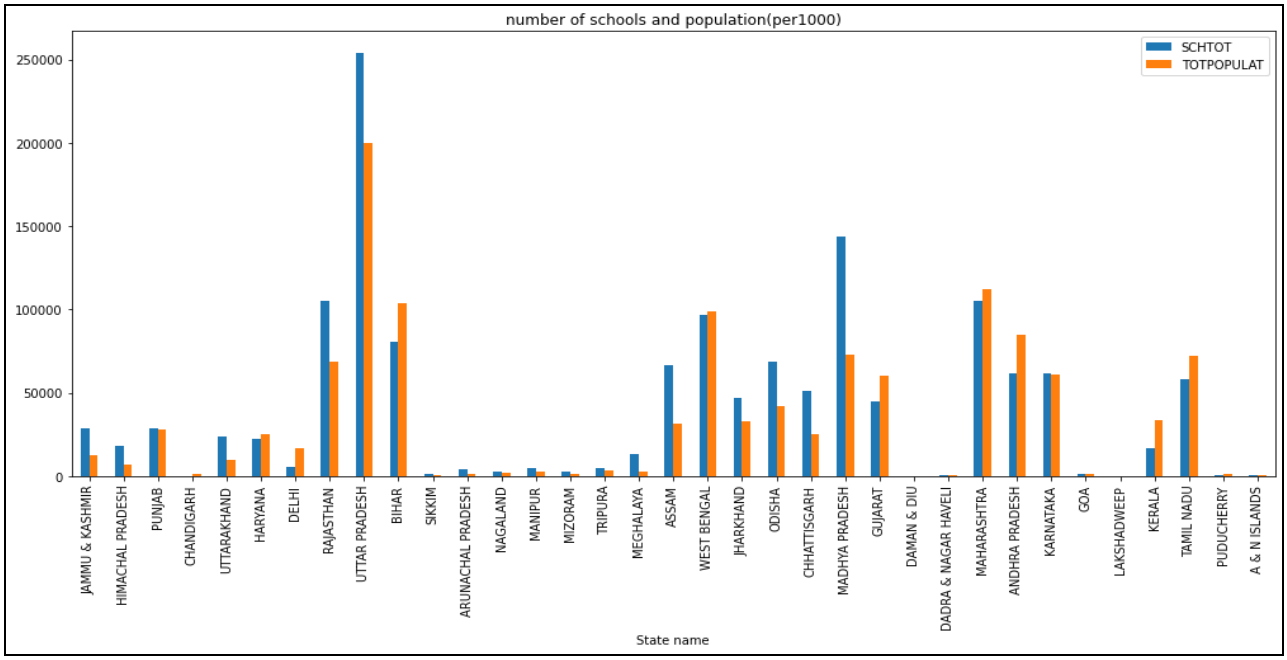
1)Effect of the population:

Let's observe the population of the states and union territories in India.



India is the second-most populous country in the world, with one-fifth of the world population. The literacy rate in India grew from 18.33 percent to 74.04 percent from 1951 to 2011. During this period, the population of India grew from 36 crores to 121 crores. Effect of population on literacy rate is unclear. A large population in many cases promoted the increase in the number of schools established in the state or union territory.

The below graph shows the effect of population on the number of schools (both private and government).

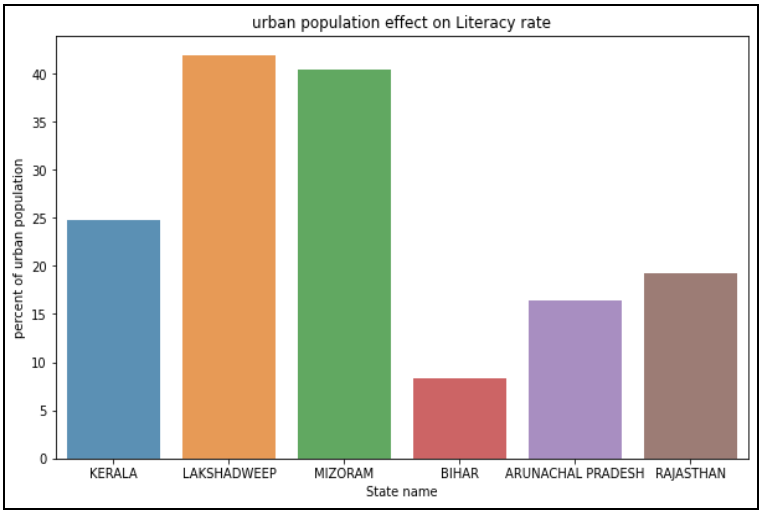


SCHTOT => total number of schools in that state, TOTPOPULAT => population of that state(per 1000)

We can observe that the densely populated states like Uttar Pradesh, Madhya Pradesh, Bihar and others have more number of schools. In general, an increase in the number of schools promotes the literacy rate if the schools are maintained well, to ensure a good education output from them. But it is evident that more number of schools does not always imply a high literacy rate in India, because Uttar Pradesh has more number of schools (per 1000 people) than Kerala (can be observed in the above diagram) but Kerala has a higher literacy rate. So we can say that there will not be much change in the literacy rate, with an increase in the number of schools. More population may return us with more literates in that place, but the percent of the literate population is low in most of the states in India.

2)Effect of urban/rural population :

We can't observe anything with just the population of the state, so let's divide the population into two categories, i.e., Urban population and Rural population and observe the effect on literacy rate. Let’s consider the top three states/union territories that have the highest literacy rate, i.e., Kerala, Lakshadweep and Mizoram. Now, let’s consider the top three states with the lowest literacy rate, i.e., Bihar, Arunachal Pradesh and Rajasthan. We have considered these six states to see the effect of the percent of the urban population on the literacy rate. The above states/union territories, considered, are according to the data taken (DISE dataset). Since the variable taken(urban population) was in percentage, the effect by the rural population on the literacy rate is just the reverse of the effect by the urban population.

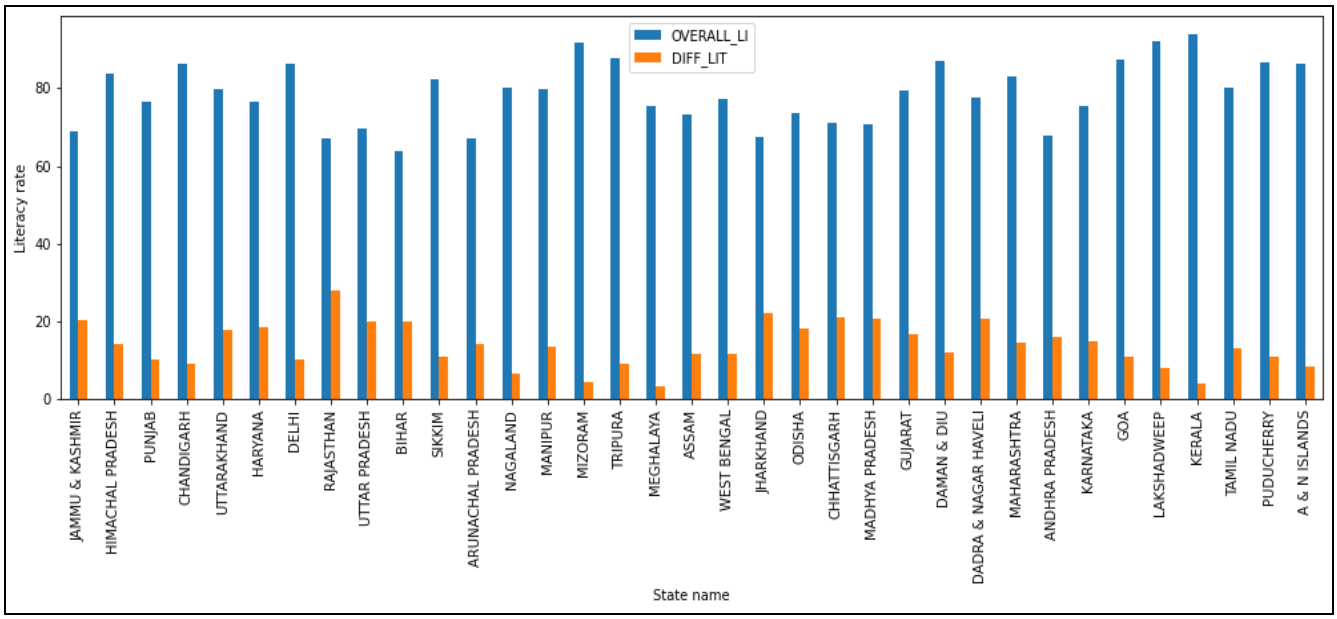


From the above bar graph, we can see that the literacy rate of the states with the more rural or less urban population is less, when compared to the states with less rural or more urban population and the gap is large enough to observe from the above graph. This observation implies that people in rural areas are less likely to send their children to

schools. Instead, the children of the rural population are sent to work so that they can support the family by contributing to the family income.

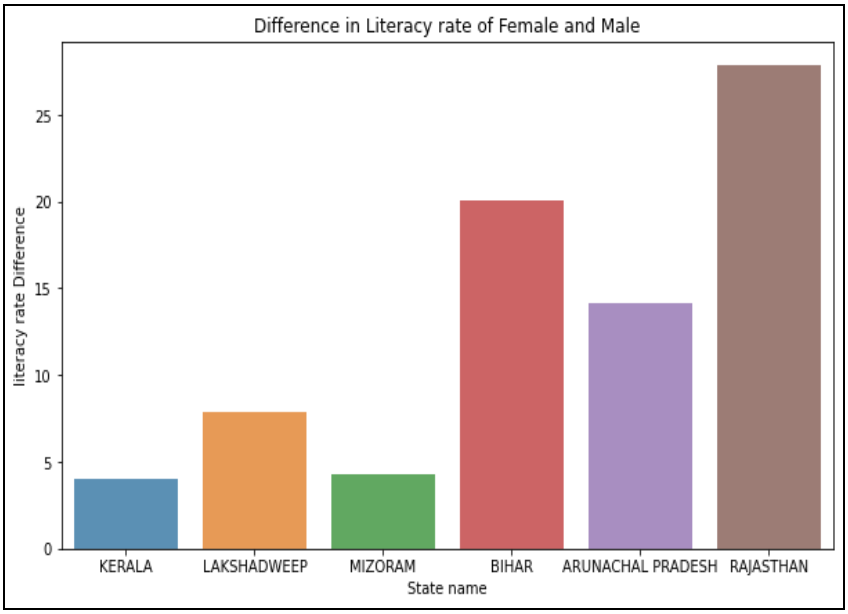
3)Effect of the Gender gap:

The discrimination between male and female population is observed all over India. The situation seems unresolved in many parts of the country till today, especially in rural areas. Although the Indian government granted equal rights in all the matters, gender disparities remain, and this discrimination is favoured towards men. Due to this discrimination, women in India have lesser opportunities in terms of education, when compared to men. It is less likely for a girl to complete her schooling, i.e., it is less likely for her to attain education at least up to the age of 14, particularly the women from the rural population of India. So let's see if there is an effect on the literacy rate due to this gender gap.



OVERALL_LI => Literacy rate, DIFF_LIT => Difference in literacy rate of male and female

We can observe that the states with low gender gaps have higher literacy rates. Let us consider the example of the six states(top 3 states/union territories with the highest literacy rates and the top 3 states with lowest literacy rates) from the previous observation of rural population and observe the effect more clearly.

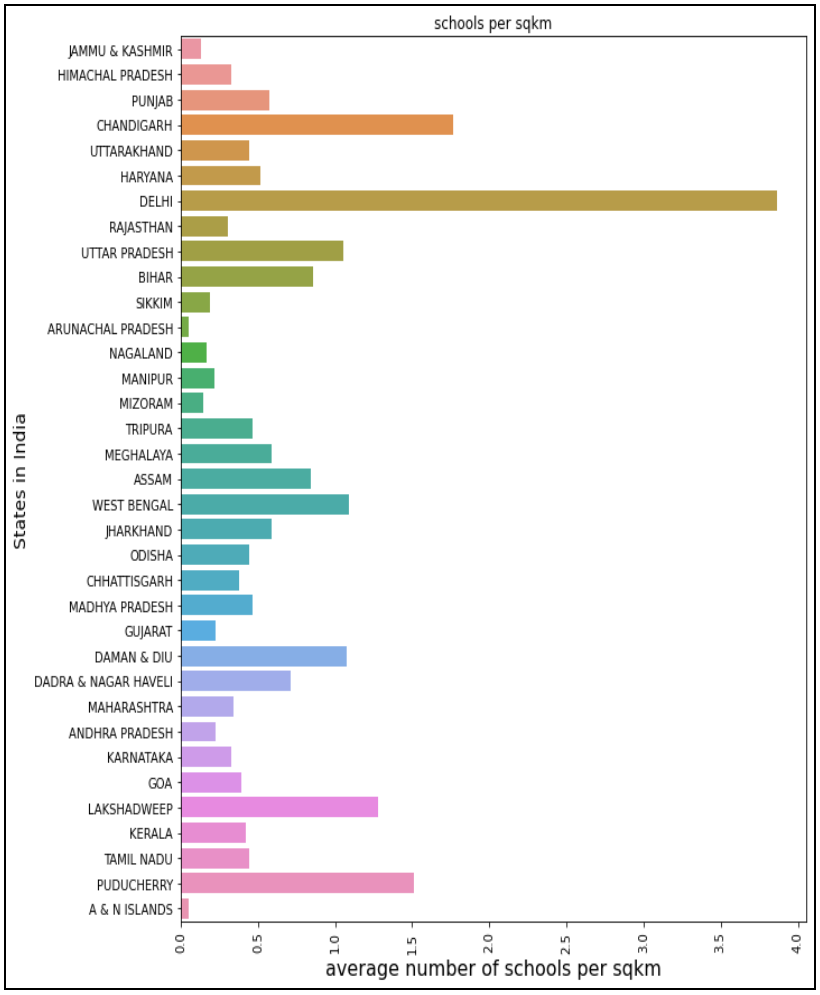


The above bar graph gives a clear picture of how the gender gap in literacy rates affects the literacy rate of the place because the states with the lower difference in literacy rate of males and females have more literacy rate. Larger the gender gap, lower will be the literacy rate.

4) Effect of Number of schools:

In India, there are more than 15 lakh schools with 26 crore students in the schools (according to the 2016-17 DISE data). Even though the schools are distinguished as private and government schools, all the schools are monitored by the Government of India. The number of schools established (as discussed in the population effect) doesn't affect the literacy rate in the states. Not only that, but the average number of schools per

square kilometre also doesn't show any sort of contribution towards the literacy rate in the observation done. Let's observe that in the below graph.

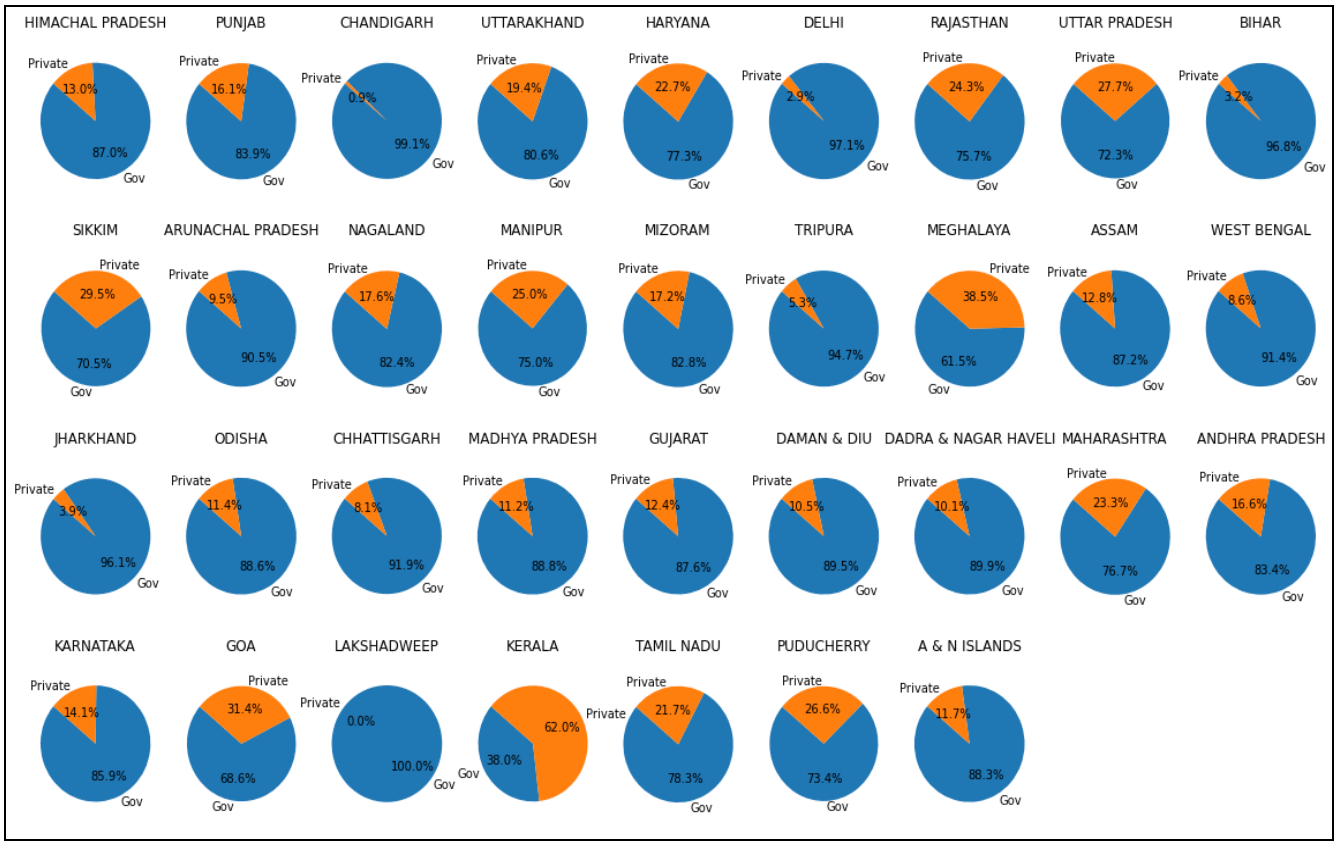


The above graph shows the average number of schools per square kilometre in each state. From the observations of the above diagram, nothing can be concluded about the literacy rate. So, let’s now divide the schools into two major categories: Public and Private schools, and observe their effect on literacy rates.

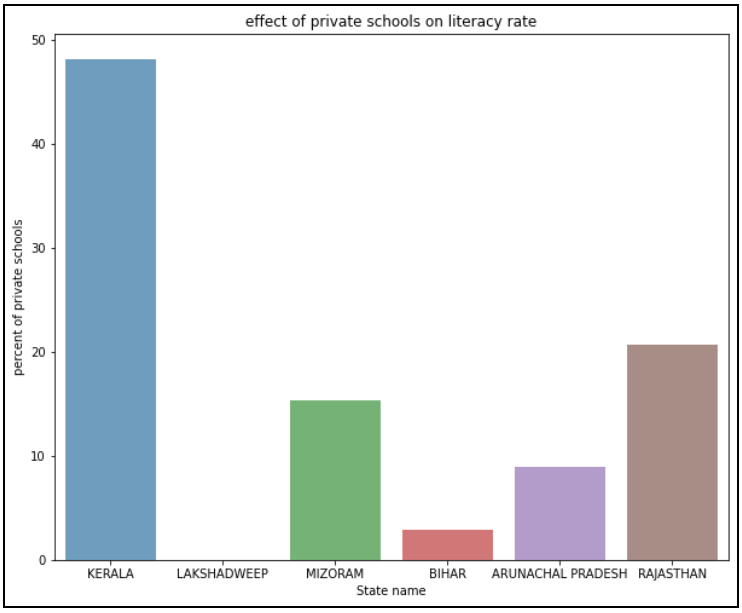
5)Effect of Private and Government Schools:

Nearly fifty percent of those in India today are enrolled in private schools. In comparison, the government schools enrolment decreased to 52 percent in the academic

year 2016-17 from around 74 percent in the academic year 1977-78. The enrolment percentage has fallen in the case of public schools, though the public schools charge significantly less fee when compared to the private schools. It was believed in India that private schools have a better foundation than government schools from the data revealed by the government itself. Let's find out the effect of percent of private and government schools on the literacy of that state.



In the above pie charts, we can observe that the role of private schools is helping the literacy rates. All the states, excluding Lakshadweep (due to its geological position), we can observe that a healthy private schools percentage is supporting the higher literacy rates they possess. Let's watch this effect on the six states example(i.e. top 3 states with the highest literacy rate and top 3 states with the lowest literacy rate):

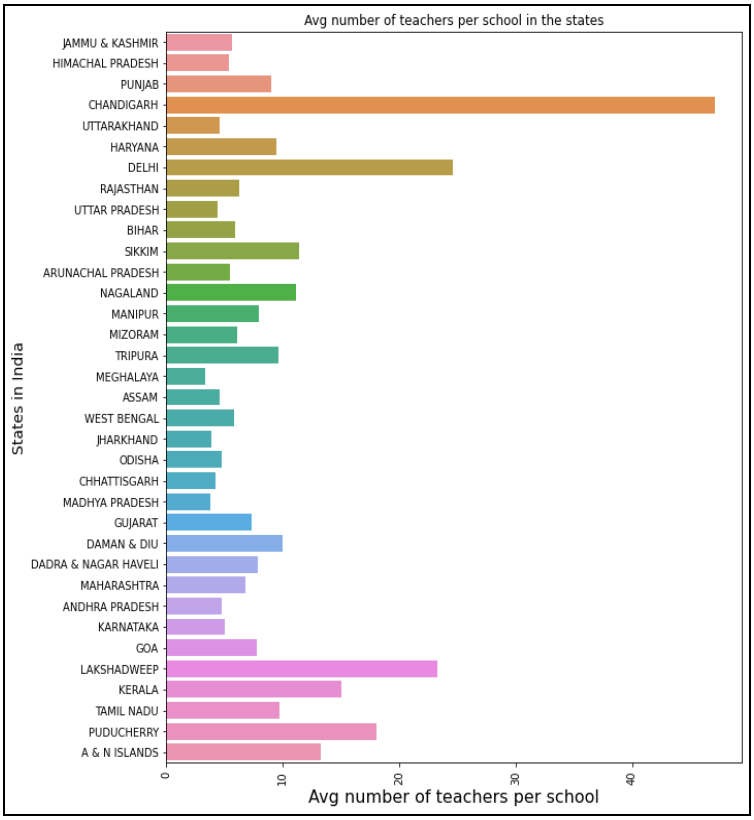


In the above graph, it is clear that the states with good literacy are backed by the private school's percentage. The performance of Rajasthan was affected by the number of private schools. For a state that large in area and population, the total number of schools is pretty low, so even the percentage of private schools is higher than the Mizoram, the number is much lesser. So we can observe a low literacy rate in Rajasthan.

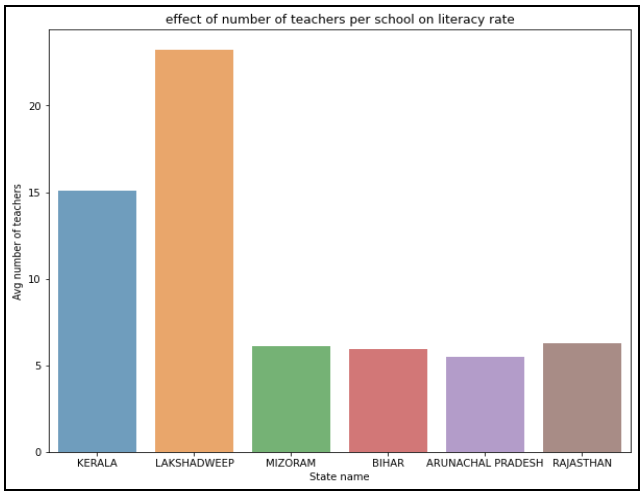
6) Effect of the number of teachers per school:

There are nearly 81 lakhs of teachers in India according to the DISE dataset in all private and government schools. Teachers enrolment in private schools is done by the management of the schools where the person to be appointed will be asked to take some tests or will be interviewed by the administration. In the case of government schools, a person has to be eligible for a nationwide examination(C-TET) and should qualify in it. Only then they are qualified to teach in a government school.

Let's examine the effectiveness of the number of teachers.

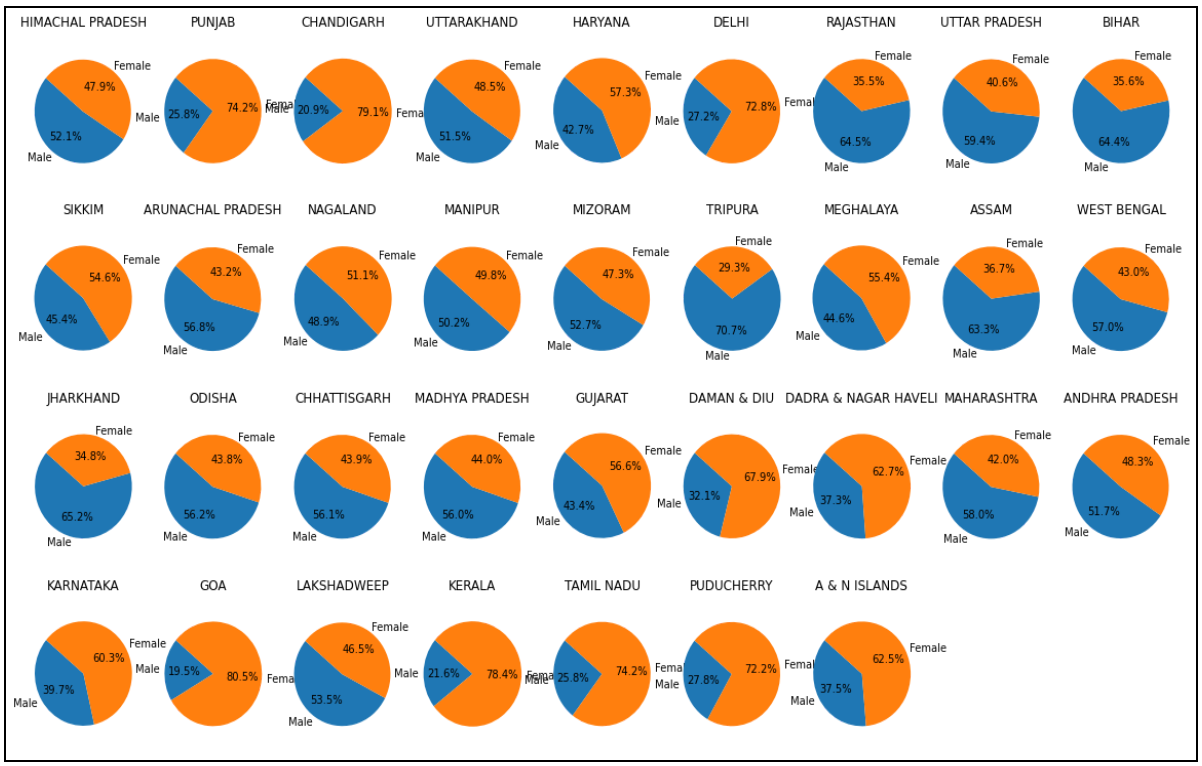


The states with higher literacy rates have more teachers per school compared to the ones with lower literacy rates. To examine it let's go back to the six states(i.e. top 3 states with highest literacy rate and top 3 states with lowest literacy rate) and see the effect of the number of teachers per school on literacy rate.

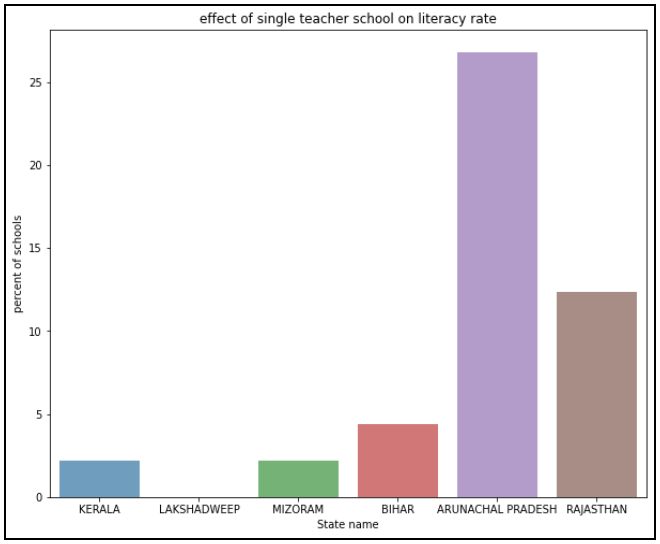


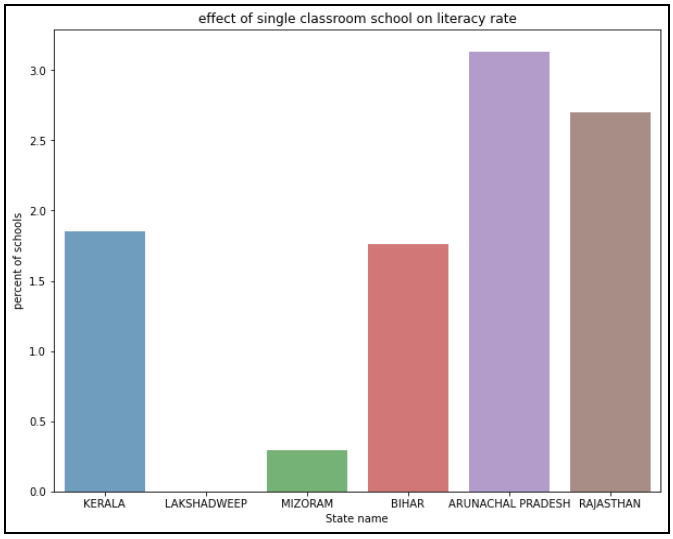
If we observe in the above bar graph, we can see that Kerala and Lakshadweep have more teachers per school than the states with lower literacy rate. Mizoram stands out to be an exception in this case. Maybe the other factors supporting the literacy rate in that state are keeping Mizoram in the top regions of literacy rate.

The following graph is of male to female ratio in the schools who are working as teachers. This will not affect the literacy rate, but the women empowerment in the teaching sector can be observed here. In the pie charts below, the percentage of male and female teachers in every state and union territory in India can be seen. We can see that almost every state and Union territory have more female faculty than male faculty. Quite a few numbers of states have less than 50 percent of female faculty. The percentage of female faculty will not affect the literacy rate because the knowledge that the student attains from the teachers is the only thing that affects the literacy rate, not the gender of the teacher.



Let's dive deeper into this aspect. There are schools which are reported to be running with only one teacher, and there are some schools which function only with one classroom. Let's observe these single classroom and single teacher schools in the six states (i.e. top 3 states with the highest literacy rate and top 3 states with the lowest literacy rate)



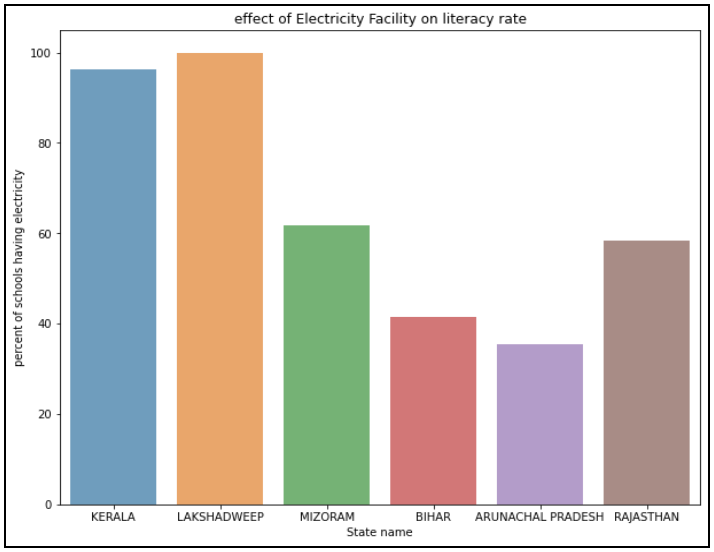


The effectiveness of single classroom/teacher schools cannot be considered on Literacy rate because these schools provide education to the children. It might be the case that the geographical location is the reason for only one teacher teaching in schools. Also,

the number of children who would want to study might be less in those areas. Hence the schools run with single classrooms or with one teacher only.

7) Effect of Electricity facility:

Electricity in schools is an essential part of infrastructural requirements to provide quality education to the children. Everyone knows how important electricity is for any sort of work. A parliamentary standing committee reported that more than 44 percent of the government schools in India didn't have electricity supply to them and the worst performer stands out to be Meghalaya with around 80 percent of government schools with no electricity facility. This clearly shows how the Government of India is taking care of the education system in India. There is evidence that shortfalls in both budgetary funding and utilisation, resulting in critical infrastructure gaps. Let's examine the same by taking the six states example(i.e. top 3 states with the highest literacy rate and top 3 states with the lowest literacy rate) :

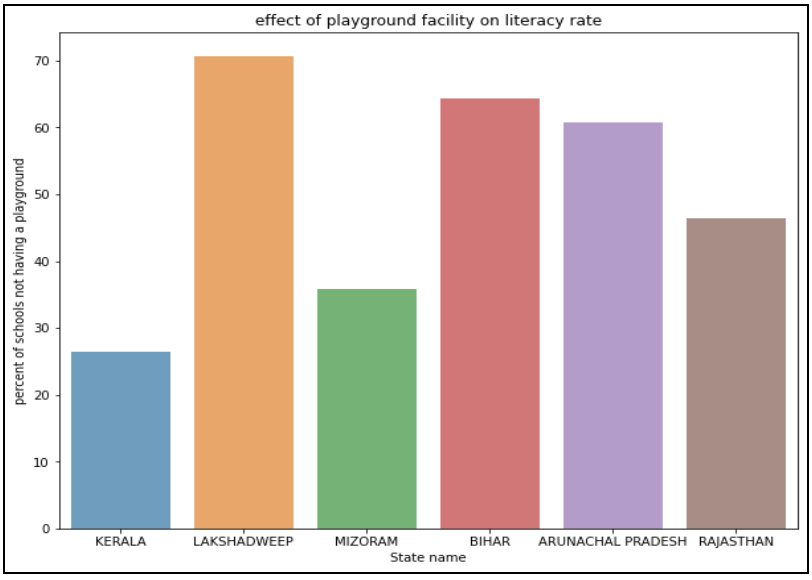


In this bar graph above, we can observe the effect of electricity facility to the schools in a state or Union territory on the Literacy rate. The states with higher literacy

rates managed to attract more students than the lower literacy rate states in the case of electricity facilities.

8)Effect of Playgrounds:

Playgrounds serve as a reliable source for relaxation from academics for the students in schools. It is also suitable for the physical strength and the mental health of the students. But more than 40 percent of the schools in India don't have a playground. One state and one union territory from the whole country come close to 9 percent of schools having playgrounds. The Central Board of Secondary Education (CBSE) guidelines say that every school should have outdoor facilities for 200-metre track and space to play games. Right to education act, 2009, also made it clear that every school should have a playground facility. But that directive was watered out in 2012 making playgrounds optional in school premises as long as schools make an alternative arrangement for the sports. Let's examine how the playground facilities affect Literacy rate in the six states example(i.e. three states with the highest literacy and three states with the lowest literacy) :



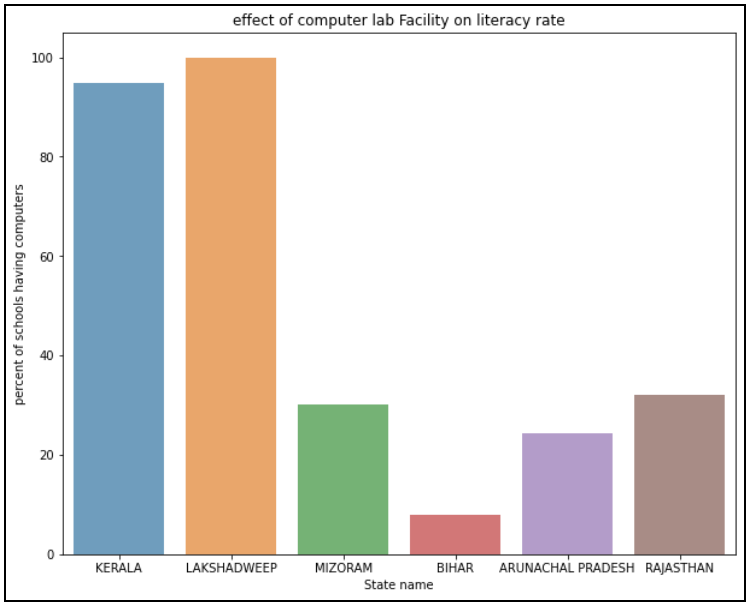
Leaving out Lakshadweep as an exception because of its geographical nature (i.e., being an island) States with higher literacy rates like Kerala and Mizoram have less percentage of schools with no playground facilities and the lower literacy rate states like Rajasthan, Bihar, Arunachal Pradesh have at least a 45 percentage of schools with no playground facilities. So if the states can pass a rule of a playground being a requirement in every school, then that will increase the literacy rate of that state in one or two decades.

9)Effect of computer facility:

Nowadays, computers have become a necessity for everyone. These new generation students definitely require computer facilities in schools for better understanding of concepts related to Computer Sciences, since this subject is gaining importance in recent times.

Every sector is opting for high technological advancements in them. Having a sound knowledge about computers and programming from an early age will help out the students to succeed in their lives because almost all the sectors, whether it be business, statistics, mathematics, economics, engineering, commerce, chemistry, data science etc. are demanding for students with sound knowledge in programming. India is known for its Information Technology hub, But in reality, only 27 percent of the schools in India managed to provide computer facilities in India.

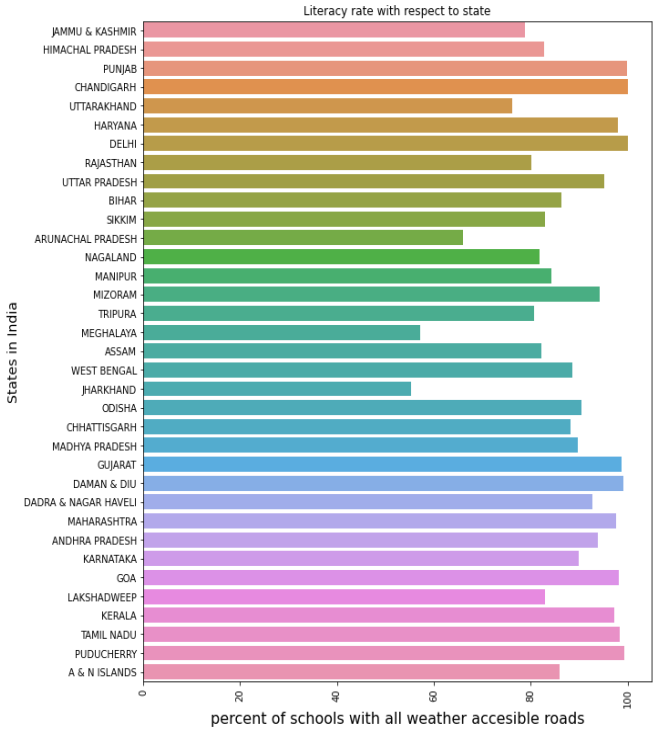
The lack of computers means teachers can’t use new technology. Instead, they rely heavily on textbooks. Let’s examine the situation using the example we previously used.



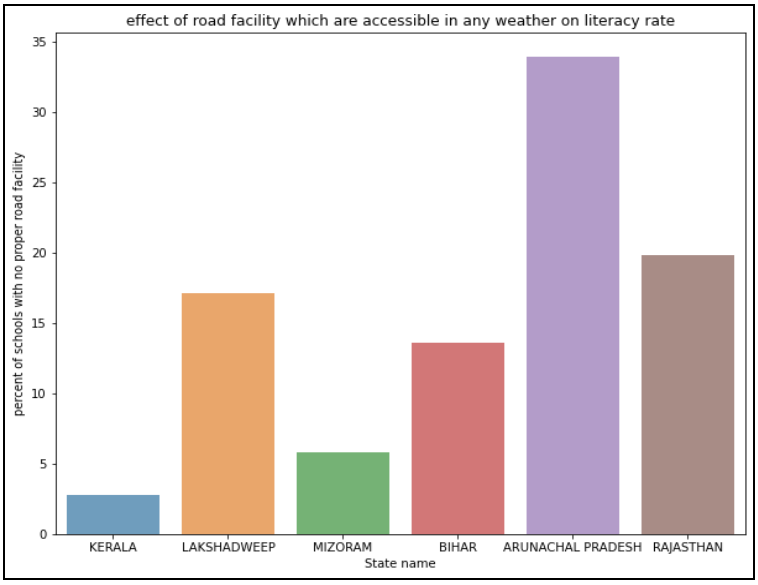
Leaving the exceptional case of Mizoram state, Kerala and Lakshadweep, which are the top states/union territories with highest literacy rates, have more than 90 percent of the schools with computer lab facilities. In contrast, the lower literacy states like Bihar, Arunachal Pradesh and Rajasthan aren't even able to touch the 35 percent mark in the schools with computer labs.

10) Effect of All-weather accessible roads:

In India, schools are considered to be the "temples of learning". The respect is shown in many ways. India stood among the top 10 countries in countries where teachers and schools are respected among 35 large nations. But the educational institutions are in bad conditions due to poor infrastructure. But the fact is India has succeeded in the road transport system to schools. The DISE dataset says that more than 89 percent of the schools in India have proper road facilities to schools which are accessible in all weathers. Let's examine the same:



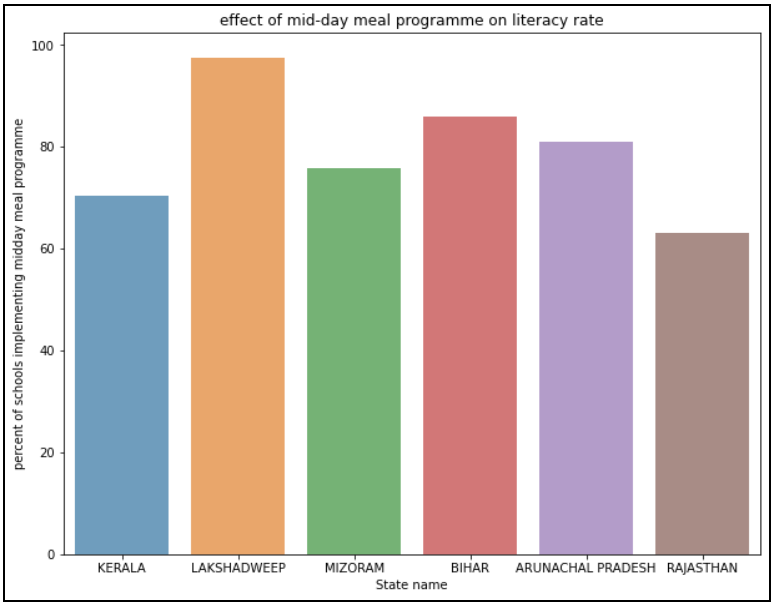
From the above bar graph, we can see that many states managed to provide a proper road facility to the schools. We can only observe a little gap in percentage for lower and higher literacy rate states which is around 10 to 15 percent. Let's examine the same using the six regions example:



The gap here is just around 15 percent, where Kerala and Mizoram maintained the percentage of schools with no proper road facility close to 5 percent. The effect of Road facility on literacy rate is less compared to the other factors discussed above.

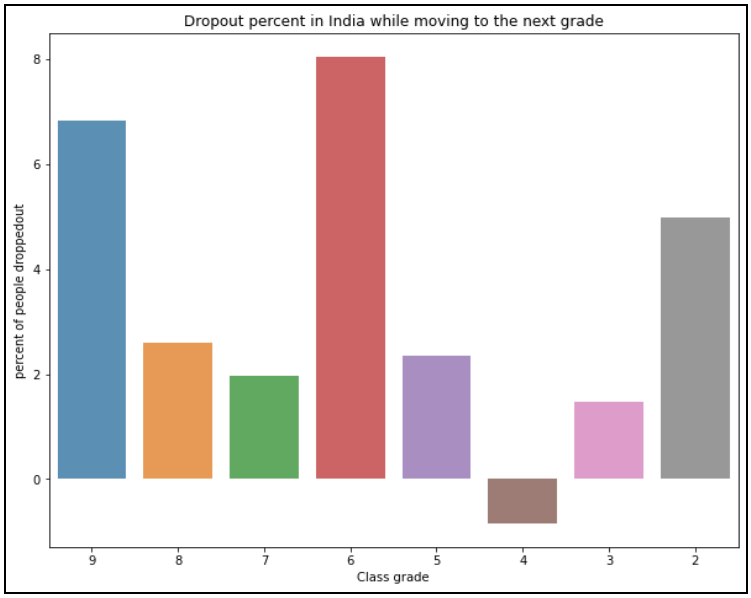
11) Effectiveness of Mid-day meal scheme:

Mid-day meal is an initiative first taken by Tamil Nadu state government, and it is now made compulsory in all the government schools in India. Mid-day meal scheme was launched to better the nutritional standing of young children, especially in the rural areas where the nourishment provided to children is dominantly low. In this way, children were attracted to government schools. Let's see did the Mid-day meal programme succeeded or not in the 6 case examples we used in the previous paragraphs:



Here in the above bar graph, we can see that every state and union territory took the mid-day meal scheme seriously and implemented it in more than 75 percent of their schools. This scheme was able to attract children to the schools but failed to show the impact on Literacy rate. This happened because of the dropout children in the earlier

stages of class grades. Let's examine the enrolment rate of class grades from 2 to 9 in India so that we can comment on what is happening with the Mid-day meal programme.



We see from this above graph that the dropout rate was maximum in the 6th class followed by the 9th class and 2nd class. Grade 4 saw a negative dropout rate, i.e., more students enrolled and less dropped out when moving from grade 3 to grade 4.

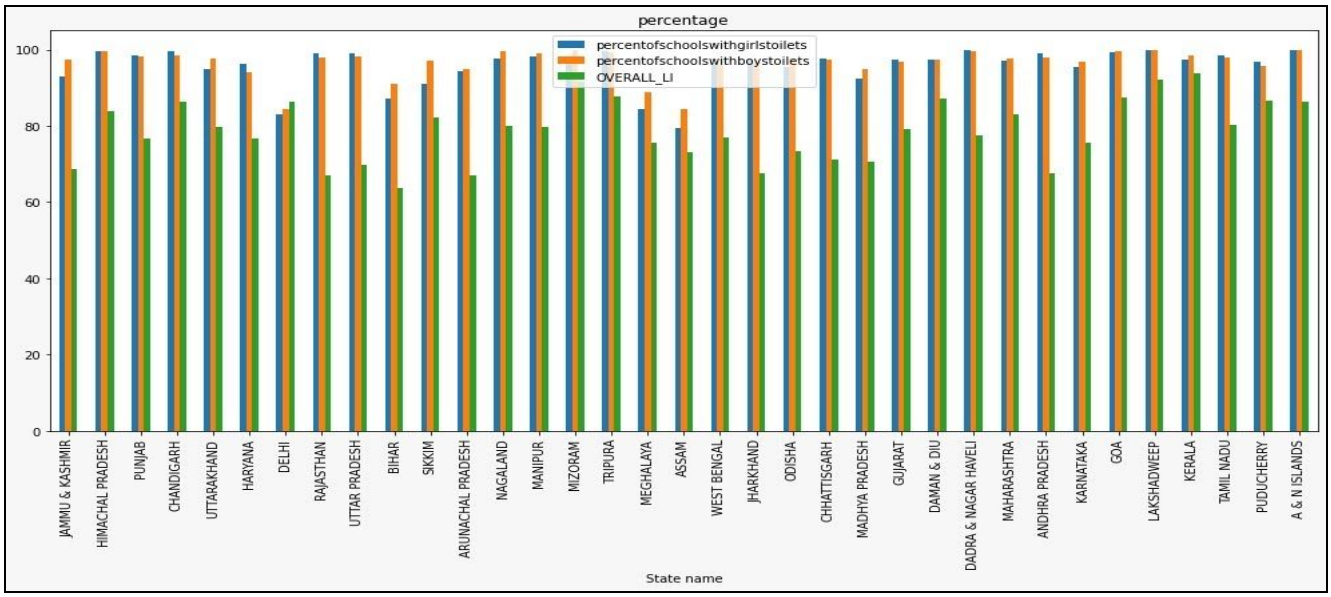
The dropout rate for 5th to 6th was really high, 8.5%. One reason for this could be that when the child is old enough to be in 5th, he is usually old enough to work too. The child's parents might need him at the farm or at their workplace to help them and start earning. This is a huge problem, especially in the rural parts of India.

12) Effect of school-sanitation facilities:

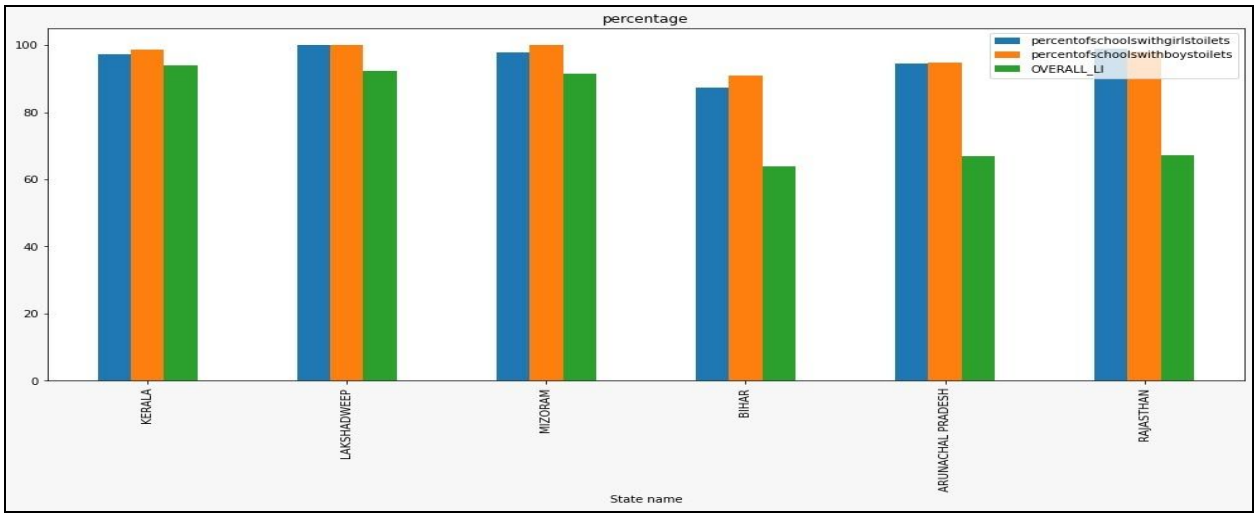
Just like other factors, school-sanitation facilities affect education attainment levels in India. Sanitation infrastructure affects the enrollment ratio, predominantly in case of pubescent age-girls, specifically among schools in rural areas. Often, lack of these

facilities causes safety concerns in terms of both health and privacy, which leads to high levels of absenteeism, and finally school dropouts.

Let's first look at the difference between states when it comes to these facilities.



From the above data, Kerala has the highest and Bihar has the lowest percentage of schools with toilets. Now let's focus on a couple of states and the gender disparity among them. The below graph shows the three states with a maximum and minimum percentage of schools with restrooms and the difference in the percentages based on gender.



Though Kerala has the highest overall percentage, it lags behind Lakshadweep(which has zero gender disparity) and even behind Arunachal Pradesh - just above Bihar in total percentages.

The average dropout rates in different states reflect a trend that sanitation facilities do affect student turnouts. The graph below shows the average dropout rates in all states.

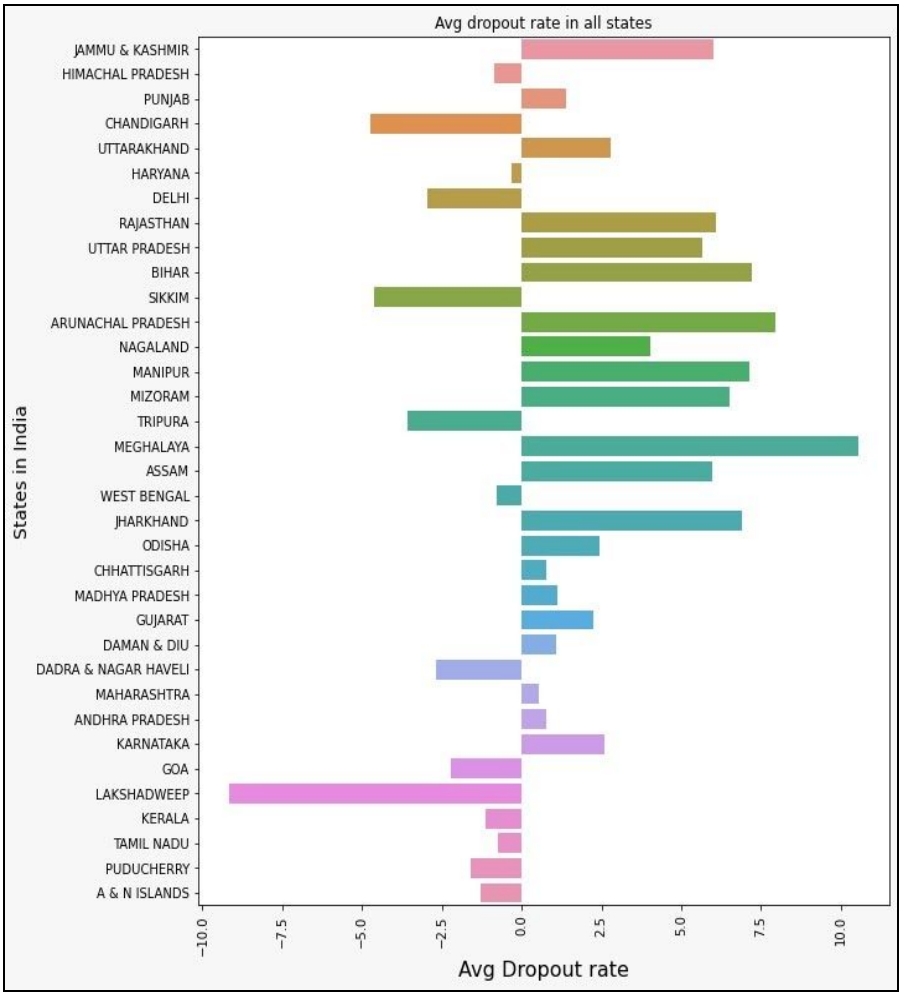
The states, Lakshadweep and Kerala which had high percentages of schools with toilets(above chart) performed better than those like Arunachal Pradesh, Bihar.

13)Dropouts in primary level classes:

The average dropout rate of India lies as a positive number these days too. Most of the children are dropping out of the school education system, and most of them are at 6th and 9th grades of the school(mentioned in a graph under point (11).

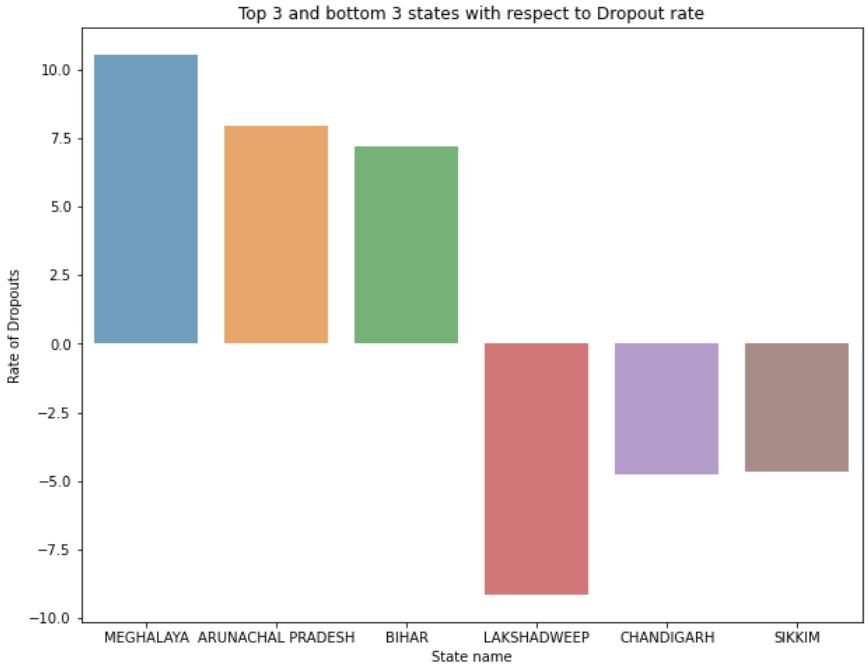
The main reason for dropouts at that stage is people believe that the children are old enough to go for work and give some financial support to their parents. Rural areas serve as a working example of this fact. People in rural India think that they use an extra hand of children to run their agricultural lands and crops.

Let’s examine the average dropout rate in all the states and union territories in India.

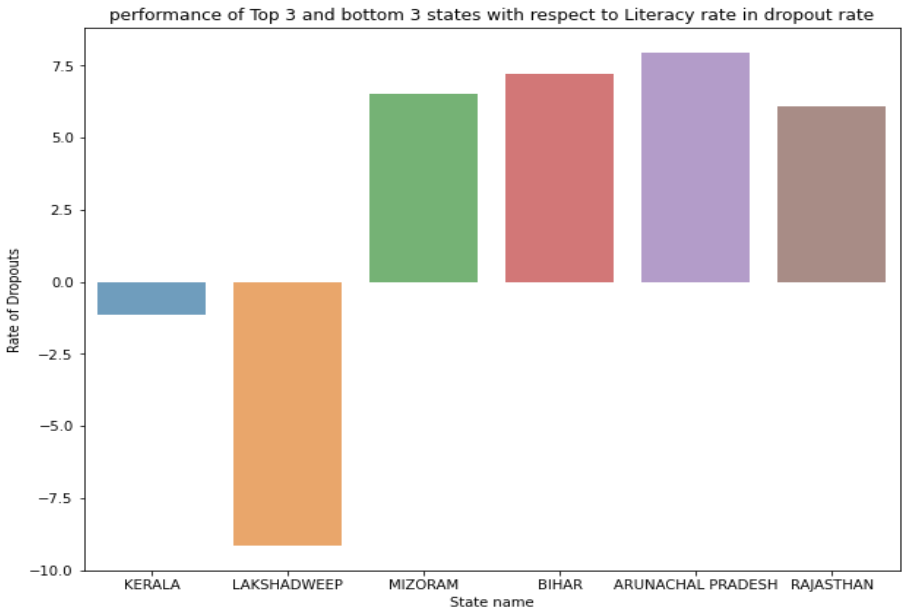


Clarification: Positive dropout rate means the total number of children opting for the next grade in the schools is decreased, and a negative value means the total number of children enrolled for the following classes are increased.

More than 70 percent of states and union territories in India maintained a positive dropout rate that means children were dropped out of education by their parents (because parents or Guardian makes the decision of studying at that age in the primary education phase). Let's see which states or union territories stand at the top three and bottom three positions concerning the Dropout rate.



We can observe from the above bar graph the high literacy rate states or union territories maintained a negative dropout rate, and lower literacy rate regions held a positive value in the dropout rate. Let's examine the situation at the top three and bottom three areas concerning literacy rate:



We can observe that except Mizoram all the other regions maintained the observations that we made on the dropout rate in the above paragraph. The reason behind why Mizoram is in this positive state of dropout rate is unknown, and Mizoram is also challenging the dropout rate of its own with the least literacy rate states. A possible reason for this behaviour is maybe a migration effect. Mizoram stands out to be a region with fewer facilities in the points discussed above. Example: In computers. So people might feel that as well and send their children to other states for the educational purpose.

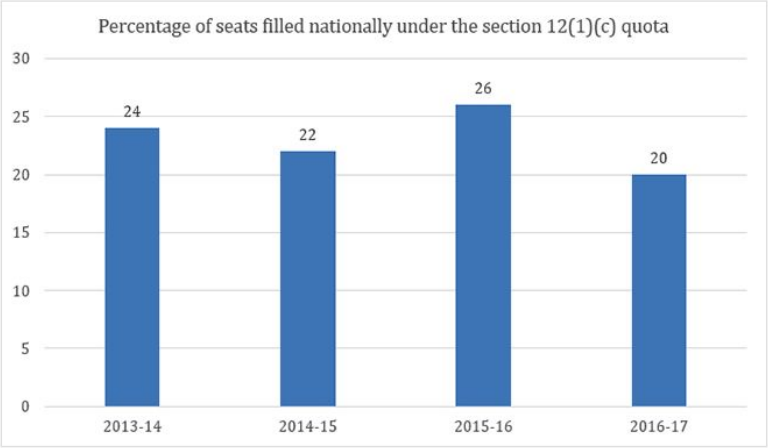
DISCUSSION:

The Right to Education Act(RTE Act),2009, has been enacted to implement free and compulsory education as a fundamental right. Enrolment in schools has increased. In between 2009 to 2016, the enrollment in the upper primary level(classes 6 to 8) has increased up to 19%, nationally. The following table shows the percentage increase in the enrolment rate in the upper primary level.

Year	No. of students enrolled in class VI-VIII (upper primary)	Year-on-year increase (in %)
2007-08	50,911,110	NA
2009-10	54,467,415	6.5
2011-12	61,955,154	12
2013-14	66,471,219	6.8
2015-16	67,593,727	1.7

Source: District Information System of Education

The RTE act has also been successful to some extent, in providing equal opportunities of education to children irrespective of their socio-economic status. Section 12 1 C of the Act states that all schools—private, aided, unaided or special-category—must reserve at least 25 percent of their seats at the entry-level (class one) for students from economically weaker sections (EWS) and disadvantaged groups (DG).



Source: The Bright Spots: Status of Social inclusion through RTE Section 12(1)(c) 2018, Indus Action

From the above graph, it is clear that 20 to 26 percent of the seats are being filled by the children from the economically weaker sections and disadvantaged groups, all over the country, during the time period 2013 to 2017. It may be noted that there is a drop in the percentage of the seats occupied, in the year 2016-17. This may be because, The subsequent expenses borne by the schools shall be reimbursed by the central government and the private schools, usually charge more than what the government schools charge. Due to this, there might be some financial issues and some other implementation hurdles, leading to the occupancy of the seats being only around 20 to 26 percent.

But the RTE act has not really helped in the improvement of literacy rates. While enrolment rates increased, the dropout rates have increased too!

RETENTION RATES IN SCHOOLS				
YEAR	All Management		Government Management	
	Primary	Upper Primary	Primary	Upper Primary
2015–16	84.21	70.70	77.59	52.00
2014–15	83.74	67.38	73.75	48.46

Note: This table does not contain data from Chandigarh, Daman & Diu, Delhi, Kerala, Puducherry and Tamil Nadu.

Source: Unified District Information System for Education

It is evident from the above table that the retention rate in government-managed schools is low when compared to the other schools. It means students of the government schools are less likely to continue studying. In spite of the government providing free and compulsory education, there are some loopholes in the Indian Education System as well as the Indian School System, which is affecting the GER and literacy rates of the country.

Now if we consider our Empirical analysis, where we compared the private and public schools contribution to the literacy rate, clearly, the states with more number of private schools outperformed the states with less number of private schools. It is known that private schools usually charge a higher fee when compared to public schools. Some

government schools don't even charge any fee. Yet we see that most of the students in the urban population are more likely to study in private schools. Even the population that is economically weaker prefer private schools to public schools. It is because of the facilities that the private schools provide. Private schools have proper sanitation facilities like a good number of washrooms for boys and girls(properly maintained), proper sources for drinking water, proper electricity facilities and the classrooms are kept well. Most of the private schools have computer facilities, playgrounds, adequate teaching aids. It might be noted that some private schools have started using digital-classrooms/ smart classrooms, where the teachers are equipped with computers, projectors, digital boards and audio-visual equipment. This helps students in understanding concepts better, and they enjoy learning.

Private schools are providing all these facilities to ensure all-round development of the students. They also have a good number of teachers. But Private schools appoint teachers based on some interviews and demo classes, whereas, to get assigned to a government school, one has to give an eligibility test. Private schools might have good facilities, but government school teachers are exceptionally qualified. The teachers in private schools might not be as well qualified as government school teachers. Teacher's quality influences a student's overall development. Facilities like computers, sanitary facilities, playgrounds are necessary. But the quality of the teachers is also essential. Also, many private schools charge a lot of fees to make profits. So if the government sets a moderate amount of fee and improves on the infrastructure of schools, people would want to admit their children to government schools, because this would ensure quality education to the students, at an affordable amount of fee.

Now if we focus on the dropout rates, according to our results from the empirical analysis, most of the student's dropout of school in Class grade 6 and Class grade 9, i.e., at the age of 10/11 years and 14/15 years. The possible reasons might be that at this age,

most of the girls are at their puberty, and the parents of these students would like to get them married and complete their responsibility. It is also evident in the table below that the dropout rate in the upper primary level is more for girls when compared to the boys. Surprisingly, the dropout rates for men are more when compared to women at primary level (according to the table below)

	Drop Out Rate Primary			Drop Out Upper Primary		
Location	Boys	Girls	Overall	Boys	Girls	Overall
All India	4.48	4.96	4.71	2.88	4.27	3.55
All India	8.30	7.86	8.09	7.48	8.29	7.87
All India	8.57	8.51	8.54	9.46	9.70	9.58
All India	6.10	5.79	5.95	4.10	6.11	5.08
All India	6.40	6.30	6.35	4.97	6.42	5.67

Source: DISE-publications

Few parents, from the rural population, want their male child to continue his education, rather than their female child, so they might discontinue the girl child's education in order to use that amount of money on the male child of the family. It might also be possible that, due to improper toilet facilities for the girls, in the schools, parents might want the girls to discontinue their education. The government should take the initiative to educate parents, especially those from the rural population of the country, to encourage the girl child of the family to study as well. It should be noted that in 2015, the Government of India has started the campaign, *Beti Bachao, Beti Padhao* (translation- Save the girl child, Educate the girl child) aimed at creating awareness and improving the efficiency of the welfare services for the women in India. The campaign focuses on gender critical places of the country and promotes education of the girl child. According to the Finance Minister of India, the GER of girls is now higher than that of boys, in primary, secondary and higher secondary level as well, which is the consequence of the

campaign (As of 2020). There is also a possibility of students dropping out at the age of 10/11 or 14/15, in order to work and contribute to the family income.

From the above empirical analysis, *the number of teachers per school(though the number of single teacher/school effects is low), basic amenities - electricity, computer facilities etc.*, heavily influence the gross enrollment ratio. The difference is more glaring if we take the *gender gap* into account. One of the key takeaways is that even among states which are at the top in terms of literacy rates and infrastructure availability, the gender difference is very much noticeable. Say, in case of literacy rate, the top three states Kerala, Lakshadweep, Mizoram, have significant differences in the number of literate males and females. Though some North-Eastern states are said to be matrilineal, discriminatory attitudes still prevail.

One of the most critical factors which are never discussed or considered as a factor affecting the literacy rate is ‘attendance rate’. The Government has not included the data of attendance in the DISE dataset, showing their negligence in this aspect. In India and majorly in government schools attendance rate of children is pretty low when compared to the private school students and children who are promoted to next grades, also, don’t have proper or higher attendance rates in government schools. This may not influence the Literacy rate because literate in India means the person who can read and write a nationally recognised language, not the one who studies to some extent.

CONCLUSION:

As the paper has pointed out, substantial measures need to be taken to improve the current state of the Indian school system, and Indian education at large. First, we need to resolve the geographically and socially skewed access to higher education institutions, by which GER can be doubled in higher education.

It may be noted that the DISE data which is used in this project, has some flaws too! The Telangana State population mentioned in the information is wrong and cannot be replaced with any other data because the official data of the census will only be available in 2021. Also, the Population of West Bengal in the DISE data is ten times more than that of the actual population. So with these flaws, the analysis may be wrong. Without proper, reliable and timely data, proper predictions can't be made. So the planning and policy-making are affected.

Other suggestions would be to upgrade the quality of education to global standards, especially elementary education, as it is a precursor to the future development of the student. We need to increase the employability of the students passing out of higher education. To expand the reach and improve pedagogy, the latest education technology has to be harnessed. Most of all, we need to achieve a quantum increase in investment in the education sector, with efficient allocation for building up the required infrastructure. Educating the rural population has to be done by the Government of India to clear the effect of the rural population on the education system in future.

Though we were able to find that investment in necessary infrastructure and quality, as well as many, schools, were strongly correlated with better educational outcomes, the regional discrepancies are very prevalent. The paper also could not quantify the societal pressure that often encourages absenteeism and school dropouts, which are prevalent in some parts of the nation. For example, it is often the case that due to societal pressure, girls in some parts of the country are not provided adequate education or are married off at a young age, which hampers their education. These cases may not always be due to unavailability of educational opportunities.

To thoroughly understand the status of education and schooling in the Indian context, societal factors should also be taken into consideration. Usually, the incentive to invest in particular areas of education, especially by private agents, depends on the social

and political fabric of the area. So if we can also extend the research to social and political factors, we will be able to analyse the situation better.

In July 2020, The Government of India has introduced the National Education Policy 2020, which can bring about many revolutionary changes in the field of Education in India. The National Education Policy 2020, focuses on "experiential learning and critical thinking". There is a significant change in the examination pattern as well. A "5+3+3+4" pattern will be followed, instead of the current "10+2" pattern. For better learning, students are taught in their mother tongue/regional languages up to grade 5. The policy has also put an emphasis on vocational training of students with a view to decrease the dropout rate. A vital feature of the policy is that teachers are also educated and guided under the "National Curriculum Framework for teacher education (NCFTE), 2021" programme. This programme is like vocational training for the teachers.

The Government of India has taken a very significant step at improving the quality of education in India, by introducing the National Education Policy, 2020. This policy would ensure quality-teachers, critical thinking in students and get rid of unnecessary examination pressure and unhealthy competition among students. In other words, it would make learning fun and create curiosity in young minds.

But the government of India should also focus on the infrastructure of the government schools and other facilities mentioned in the discussion, in order to attract more students to attend school and decrease the dropout rates. This would ensure a positive impact on the GER as well as the literacy rate of India.

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APPENDIX:

Note:

For a better understanding of the results that we found out, we used a six region example in many observations to simplify the complexity in the images occurring from all the states and union territories. Six regions are sorted according to the literacy rates where three of them are high literacy rate regions, and the others are low literacy rate regions. Here regions mean States or Union territories.

Check ‘project_eco301.ipynb’ for the code. Coding was done in google colab. Use datasets ‘data_2016-17_statewise_dropout.csv’ and ‘data_2016-17_statewise.csv’ prepared from the ‘SRC_Rawdata_2016-17_Elementary’ dataset available in the DISE website. All the datasets are submitted in the zip file.

Outputs of the code are already saved in the code, and a separate folder of pictures of all the outcomes are also kept in the zip file.

To execute the code use jupyter with the two datasets mentioned above with path changes in snippets 2 and 30 or directly upload and the file ‘project_eco301.ipynb’ to google colab and the two datasets mentioned above in the drive and use the path(where the datasets are stored in google drive) of the above two datasets in the code in snippets 2 and 30.

Full-Form of the variables used in coding:

'SCHTOT', => total schools

'SCHTOTG', => total govt schools

'SCHTOTGR', => total govt schools - rural

'SCHTOTPR', => total private schools - rural

'TCHTOTG', => teachers in schools - govt

'TCHTOTP', => teachers in schools - private

'SCLSTOT', => single classroom schools

'STCHTOT', => single teacher schools

'ROADTOT', => Schools Approachable by All Weather Road

'SPLAYTOT', => Schools with Playground Facility

'SWATTOT', => Schools with Drinking Water

'SELETOT', => Schools with Electricity

‘Ci_G’, => Girls Enrolled in class ‘i’ (i = 1 to 9)

‘Ci_B’, => Boys Enrolled in class ‘i’ (i=1 to 9)

‘OVERALL_LI’ => Literacy rate

‘MALE_LIT’ => Male literacy rate

‘FEMALE_LIT’ => Female literacy rate

‘STATNAME’ => Name of the state

‘AVG_DROP_OUT’ => Dropout rate of the entire area

‘MDMTOT’ => total schools implementing mid-day meal programme

‘SCOMPTOT’ => total schools with computer facility

‘P_URB_POP’ => percentage of urban population in a region

‘Diff_Lit’ => difference in literacy rates of male and female

‘PMTCH’ => professionally qualified male teachers - private

‘PFTCH’ => professionally qualified female teachers - private

‘PCMTCH’ => professionally qualified male teachers - government

‘PCFTCH’ => professionally qualified female teachers - government

‘SGTOILTOT’ => total schools with girls toilets

‘SBTOILTOT’ => total schools with boys toilets

‘AREA_SQKM’ => Area of the region in square kilometre