Asha Chennai Assessments Analysis – 2024-25

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With help from Ms. Gomathy – Software Developer Asha Chennai

Asha has been conducting the following assessments for all the children in the schools supported by our SPRINT program.

1. Oral Assessments in Maths, English and Hindi/Tamil using the ASER toolkits.
2. Written assessments in Maths and English.
3. CS assessments in Digital Literacy for class 5 and in programming for class 7 or 8 (depending on whether they are using the new CS curriculum or old CS curriculum).

As the oral assessment status is the same set of questions asked to each student in all classes every year, it makes it suitable for comparing the progression of students across the classes and also to see how the schools or group of schools are performing across the years.

In addition to the assessment, we also collect the following data about the students,

- Identity so that they can be tracked across the years and even across schools when they (say) move from primary to middle school.
- Gender
- Date of Birth
- Height and Weight.
- Parents' education level.
- Whether they live in the same hamlet as the school, another hamlet within walking distance or farther away.
- Is the student regular with homework?
- Attendance Percentage for the whole year.

And we also collect the following details about the school from the UDISE database.

- School strength.
- No of govt teachers and number who are male and female among them.

These assessments have been conducted rigorously. These are always conducted by teachers other than those who teach at a school. Detailed training is given to the teachers so that these are conducted in the same manner across all the schools. These have been conducted every year starting from 2014-15 when it was conducted at 8 schools in Thiruvallur. This year, the assessments were conducted at 190 schools across UP and Tamilnadu. Even during the Covid years when the schools were closed, these were conducted in the mini-schools that Asha was running.

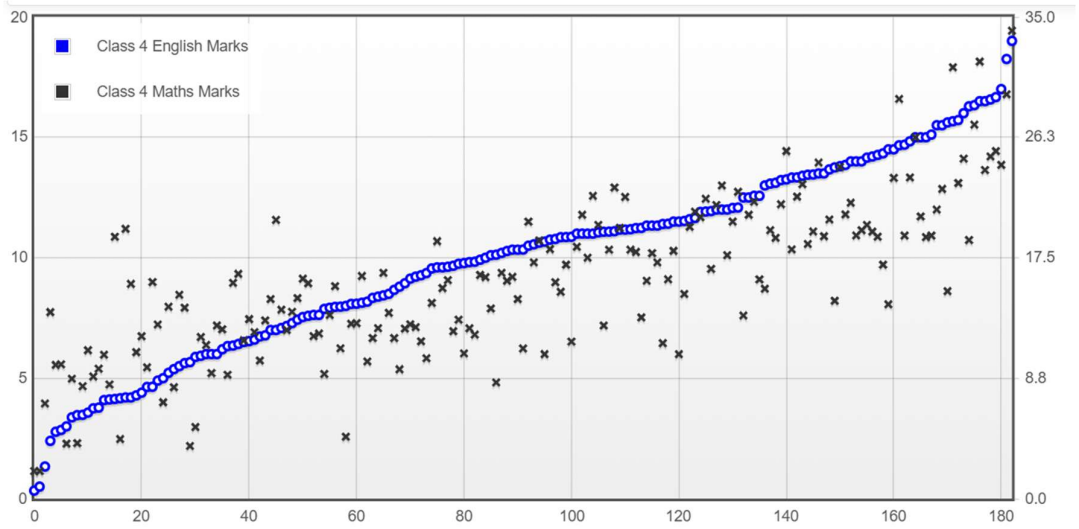
Here are some analyses of our data. I had written a blog on the "Factors that Affect Education". The results quoted in that article are also presented in more details here.

1. Consistency in Performance

Before we can try to understand the factors affecting the performance of students, we first need to ask the question if there is such a measurable thing as academic performance. If this varies too much with subject, method of evaluation, time when the evaluation is done etc. then there is little point in speculating about the cause of such performance. But we have found that indeed performance of both students and schools remain very consistent across subject, methodology, time etc.

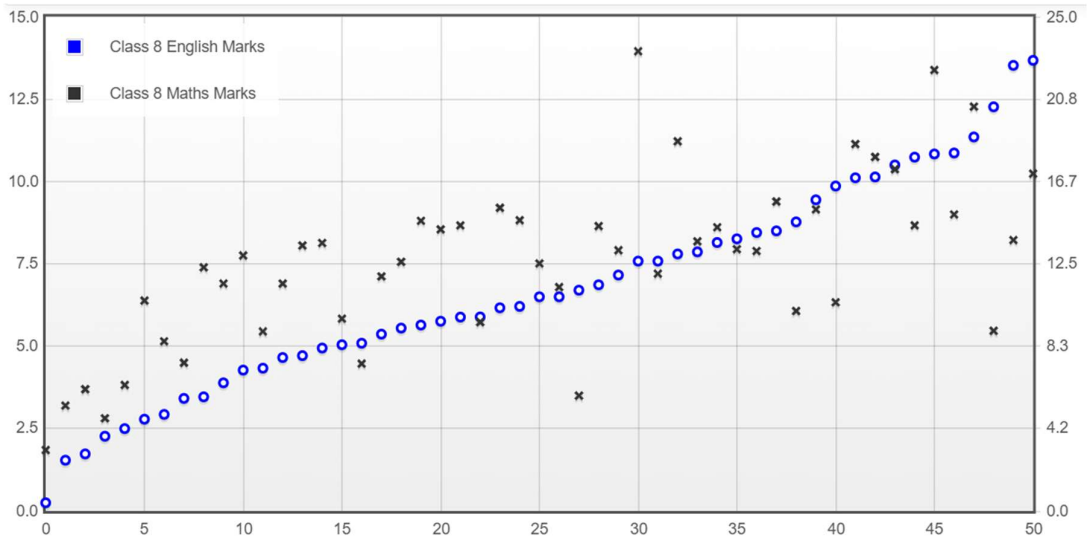
1.1 Performance in Different Subjects

Here is the average English and Maths written assessment marks for class 4 in various schools in 2024-25.



Correlation value: 0.794.

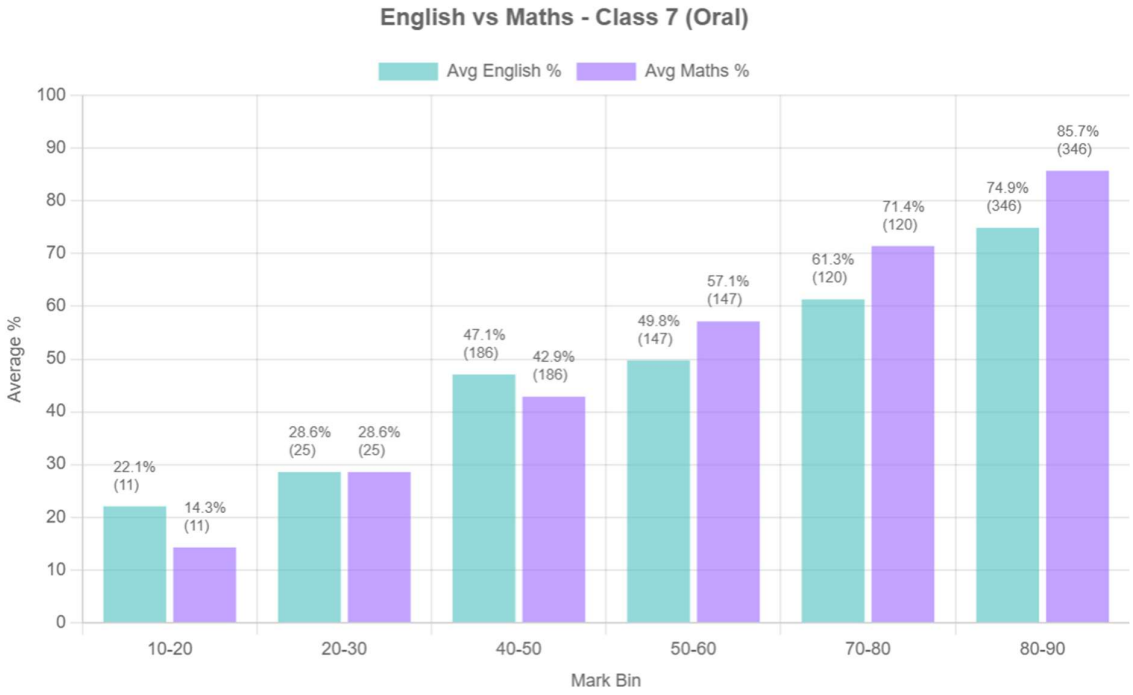
Here is the average English and Maths written assessment marks for class 8 in various schools in 2024-25.



Correlation value is 0.652

Schools that do well in English do well in Maths as well!

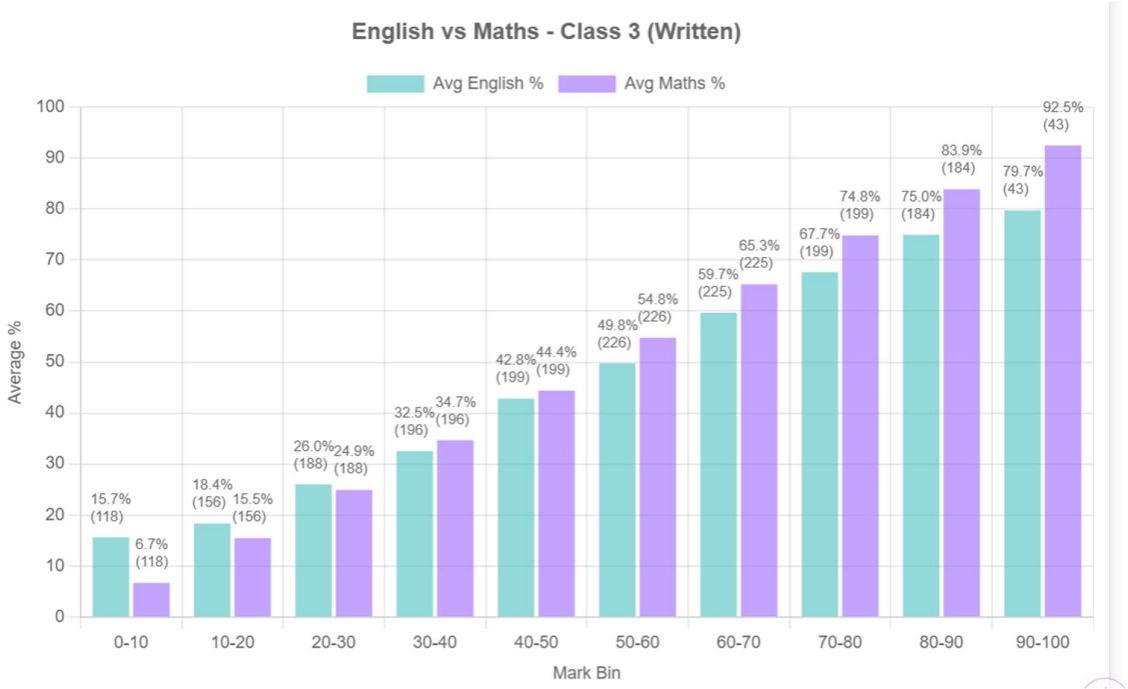
At the student level as there are a very large numbers of students, we show the bucket-wise averages. Here is the data for 7th std oral marks.



Correlation Value: 0.59

Note that this graph groups students by the marks they have got in Oral assessment converted to a 0 to 100 scale. The purple bar shows the Maths score of those students. The green bar shows the average score in English for those same students. The number of students with that Maths score is also shows in the bracket above the bars. Note also that oral score can only have 7 values (0 to 6).

And here is the correlation in English for 3rd std students.



Correlation Value: 0.71.

Again, students who do well in English also do well in Maths in both oral and written assessments.

1.2 Performance in Oral and Written Assessments

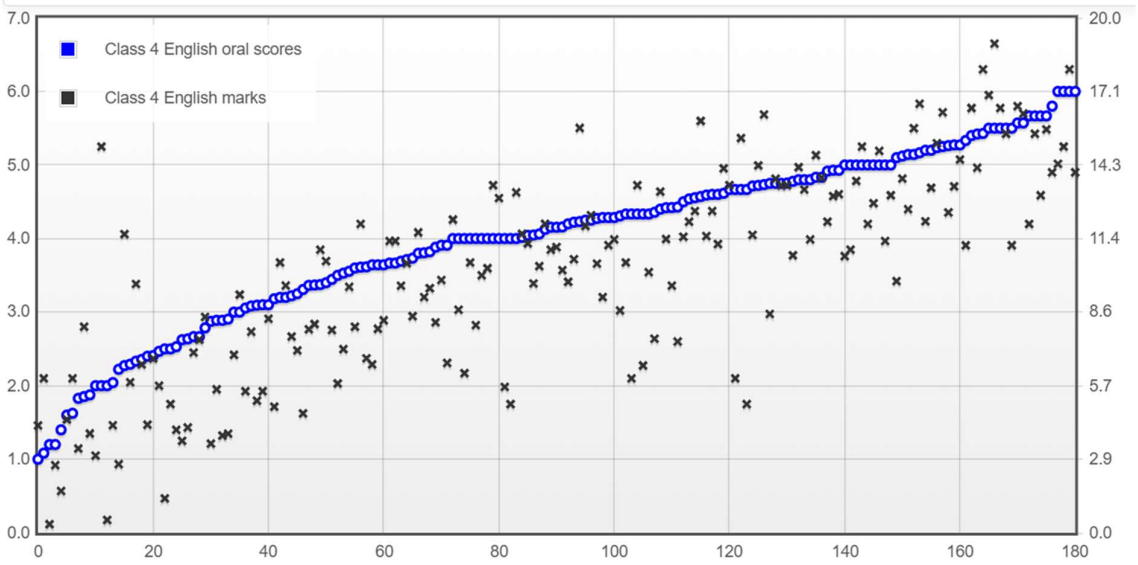
What about different methodology? Our Oral assessments just check the basic skill level of the children irrespective of the class they are in. For eg in maths, we check if the children can,

- Read 1-digit numbers.
- Read 2-digit numbers.
- Do a 2-digit addition sum without carry.
- Do a 2-digit subtraction sum with borrowing.
- Multiply a 2-digit number with another where the answer is more than 1000.
- Divide a 3-digit number by a 1-digit number to get a 3-digit quotient and a remainder.

Whereas the written assessment is aligned to the class of the student and tests if the student knows all the important concepts for that class including some from earlier classes. It will have word-problems, problems with blank on the left side (eg. 3 + ___ = 5), problems that apply 2 steps etc. And these are different every year and the students have to write the answer.

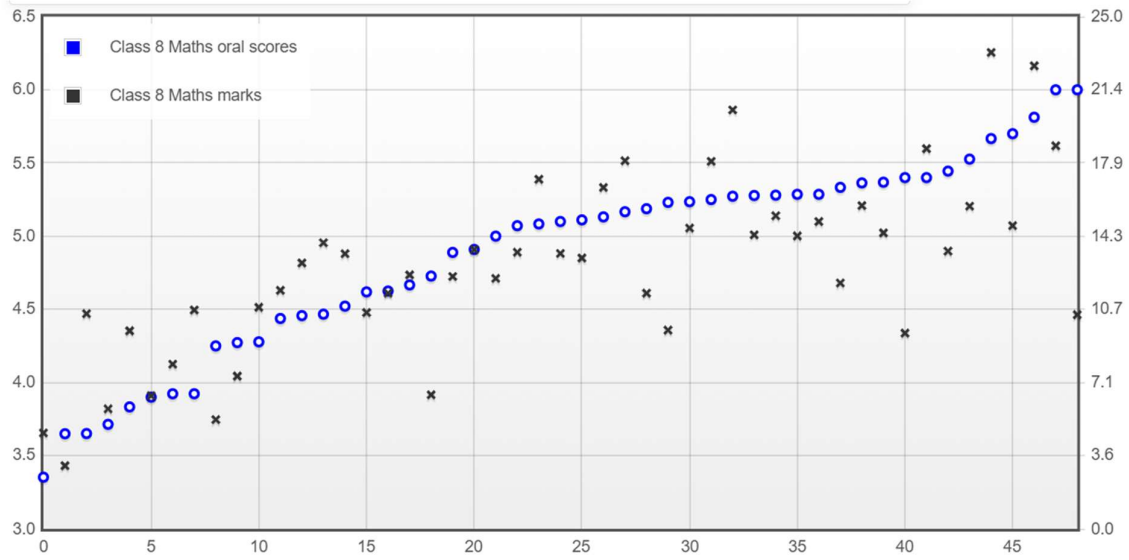
Therefore, the methodology employed in the two assessments are vastly different. How are student scores in these correlated?

Here is the correlation between the oral and written scores in English for class 4 students in 2024-25.



Correlation value: 0.80

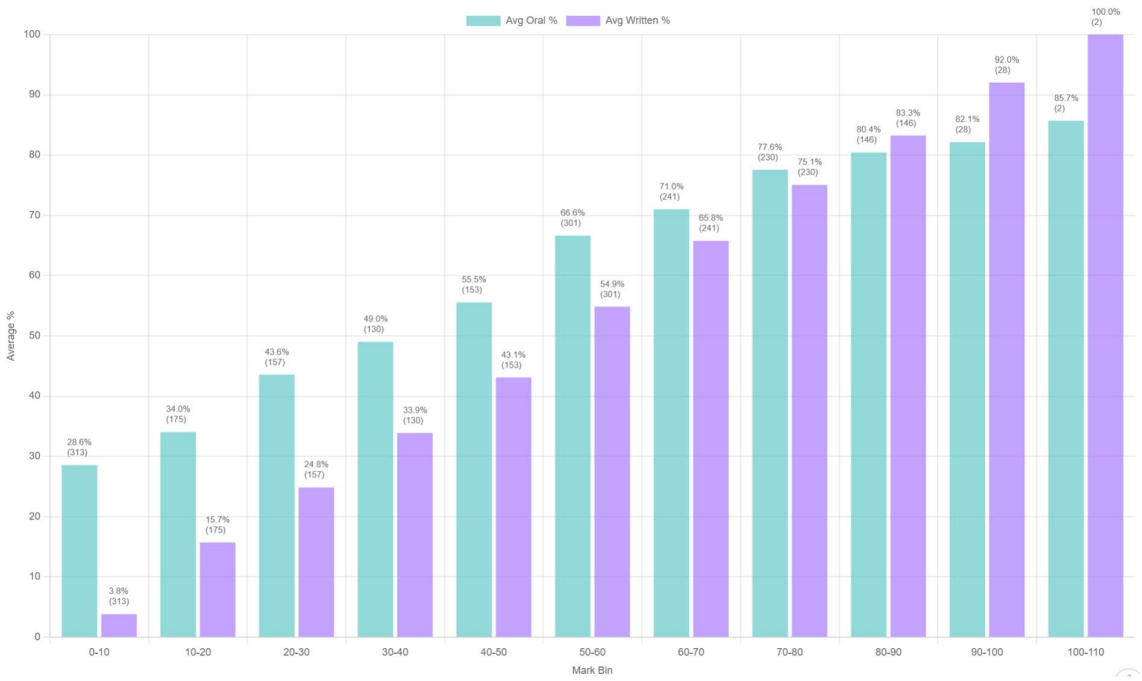
Here is the correlation between school average Oral and Written scores for students in Class 8 in Maths in 2024-25.



Correlation Value: 0.76.

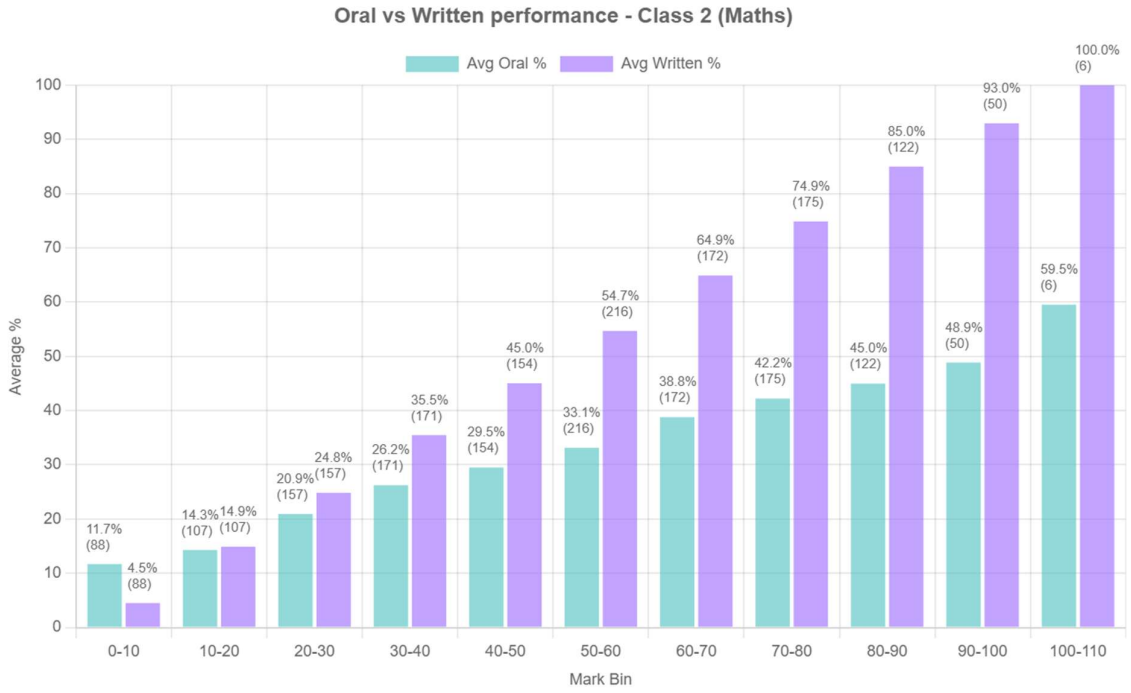
Schools that do well in oral assessments do just as well in Written assessments!

How about individual students? Here is the student level correlation between Oral and Written in English for class 4.



Correlation Value: 0.75

Here is the student level correlation between Oral and Written in Maths for class 2.

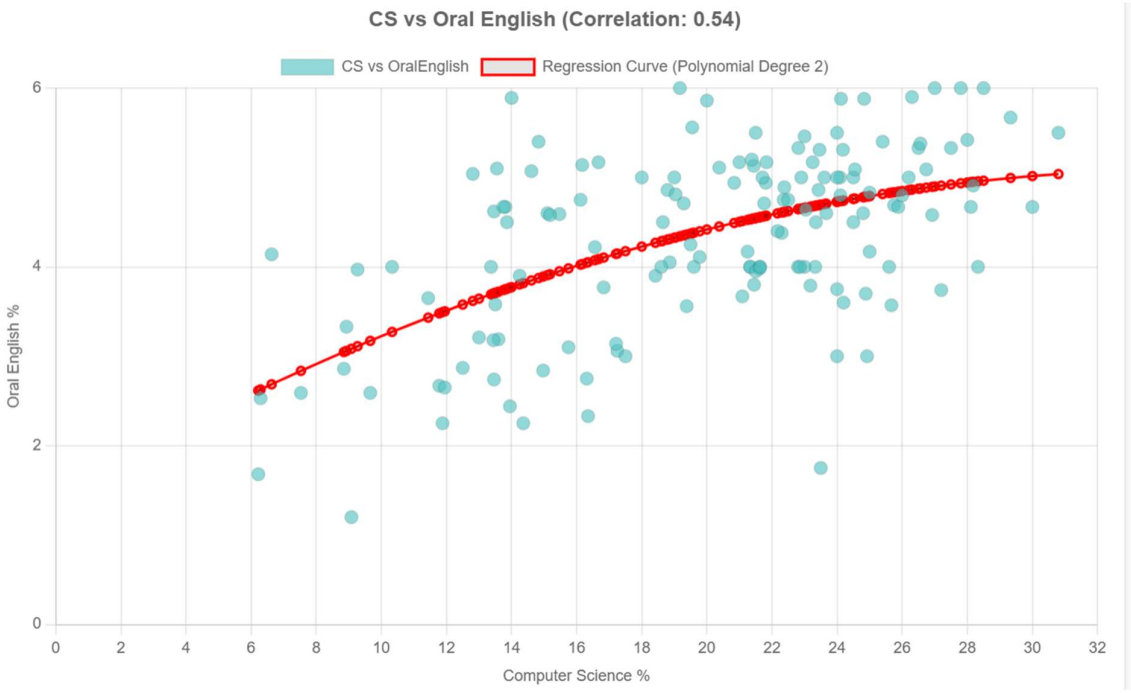


Student also shine in both oral and written assessments or have challenges in both!

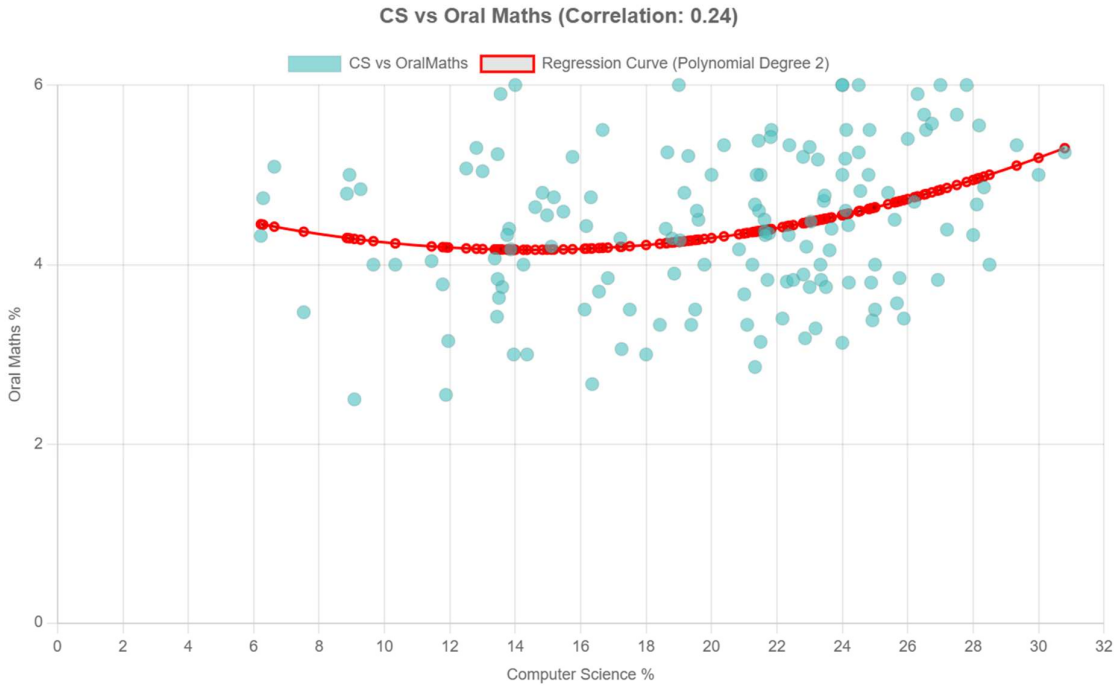
1.3 Performance in Computer Science

With our computer science assessments. We have the opportunity to check the performance of these same students against our own computer science assessment. Here the curriculum has been frames by us to be a "Learn by Doing" method where they learn it practically. The assessment also requires the students to demonstrate what they learnt practically on a computer. We conduct an assessment on Digital Literacy in 5th std and an assessment in programming in 8th std. How does this compare to the Maths/English Oral/Written scores at the school or student level. As we didn't see much difference in the correlation between oral and written, we are just showing the correlation with oral scores below.

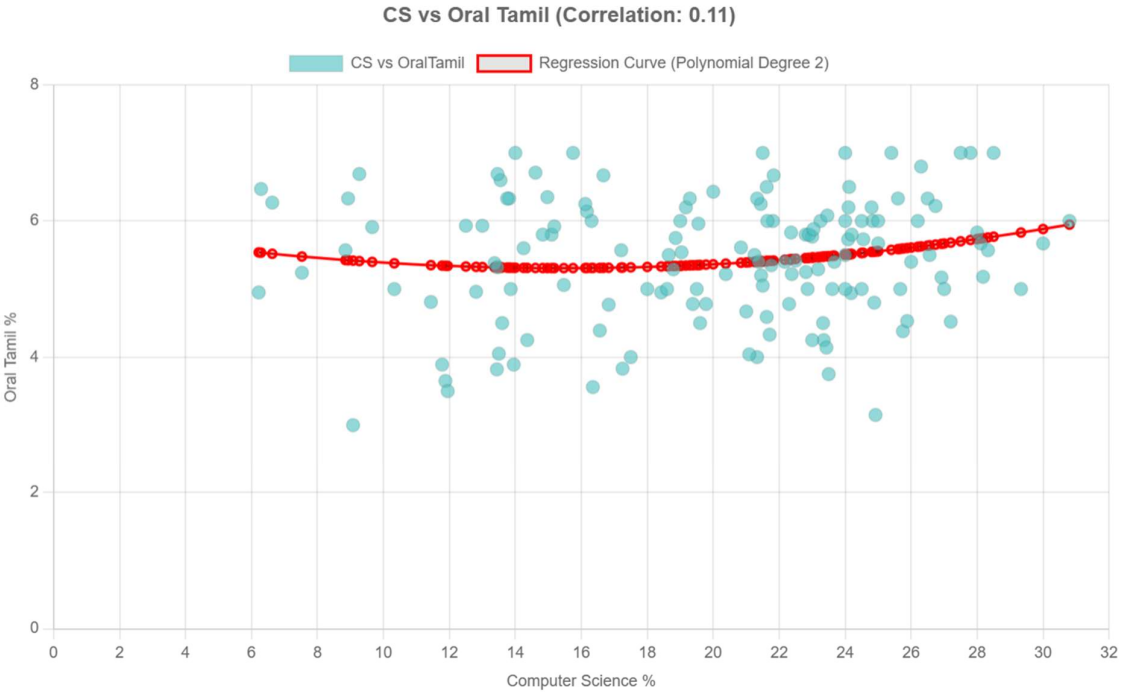
Here is a comparison of the CS scores with the English oral scores of schools at the class 5 level.



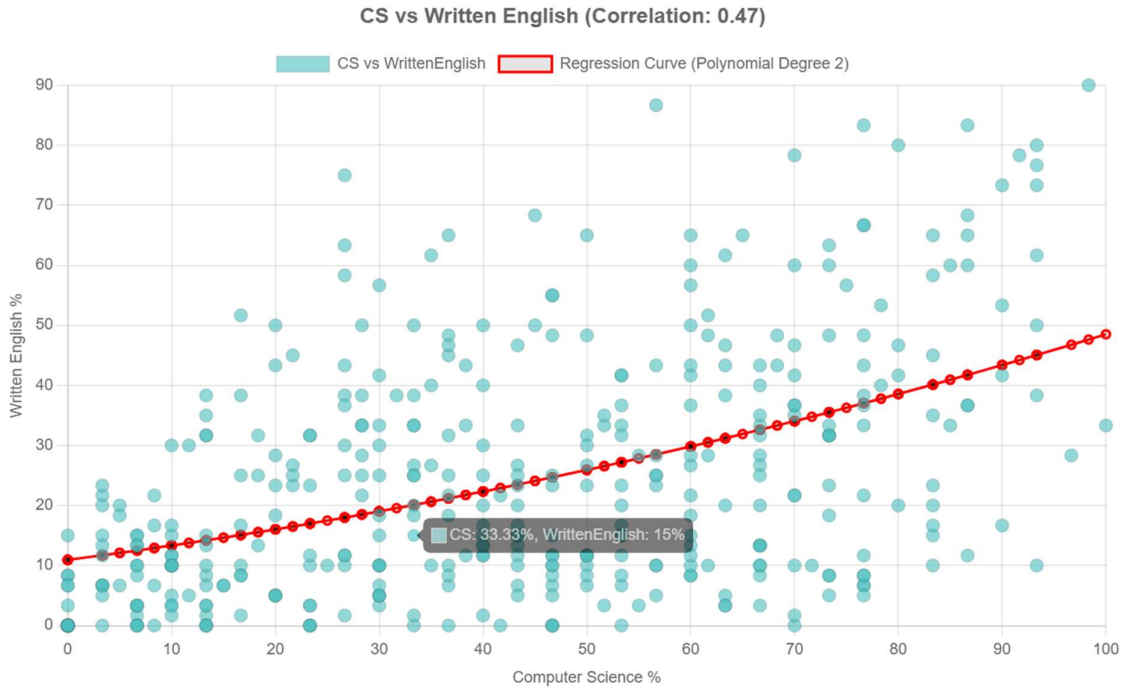
The following graph compares the CS performance with the Maths oral scores.



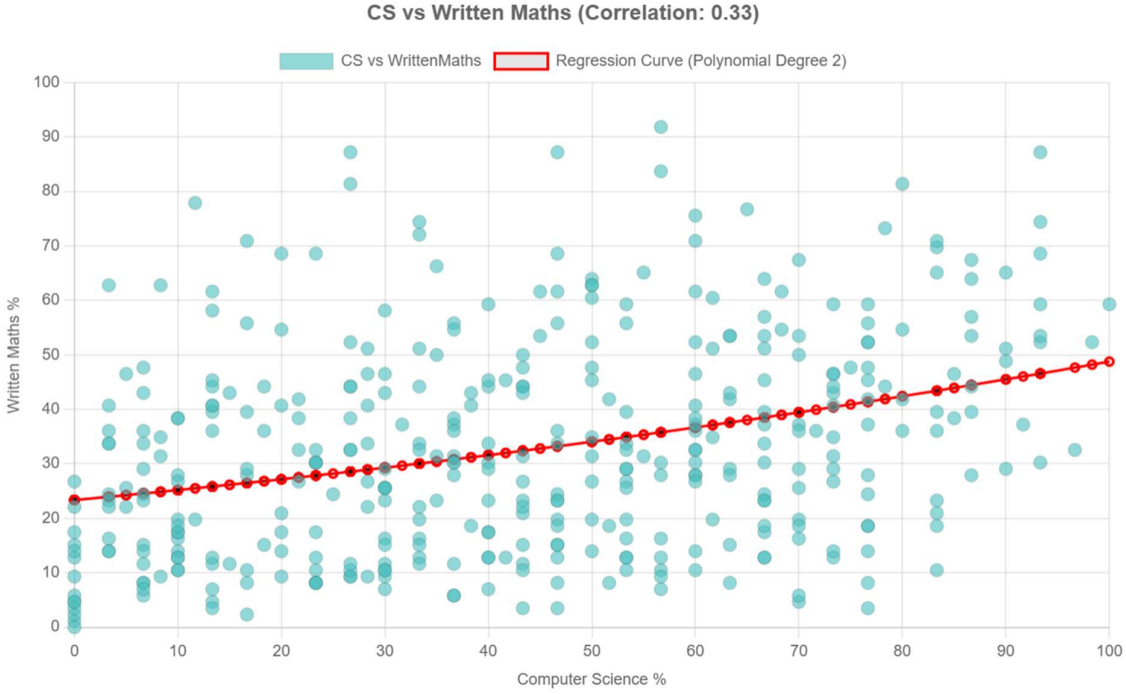
And here is a graph that compares it with the Tamil oral scores.



We have only displayed school level information for 5th standard as there was a small sample of 25 schools taking the 8th std programming test. We expect a higher number in the coming years. Here is the correlation of class 8 student scores with written assessment scores in English.



And here is the graph showing the class 8 programming test marks in comparison with the Maths written assessment marks.



As you can see the both the digital literacy learning seems much better correlated with English than with Maths. The correlation with Tamil performance is much less. This may just be because all the things they have to read on the screen is in English. We have seen children struggle to read something like the word “Insert” or “File” or even the name of the files in a folder. This may be impeding their learning. We expected these problems to become less important by 8th std and with programming. But that correlation also remains high. Performance in Tamil seems uncorrelated with the performance in CS.

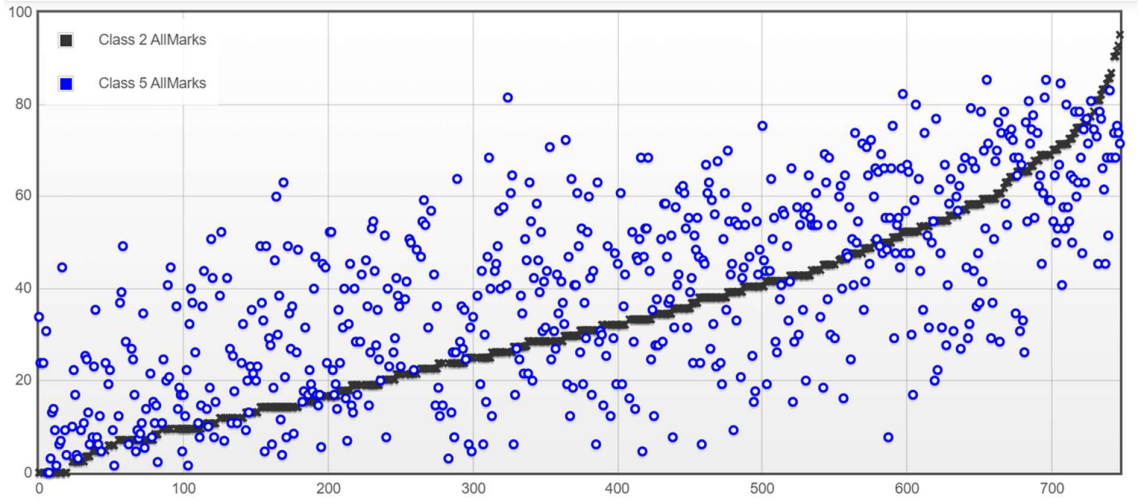
However also to be noted is that these correlations are much less than the correlation between English and Maths scores or between Oral and written scores. As I can see it, the reasons may be,

1. In the case of the CS assessments, both the methodology and the subject being tested were different and therefore a lower correlation is to be expected.
2. The pedagogical approach we have taken is different and the curriculum emphasises a practical approach to learning. These may be reaching more or at least a different set of students.

1.4 Performance Across Time

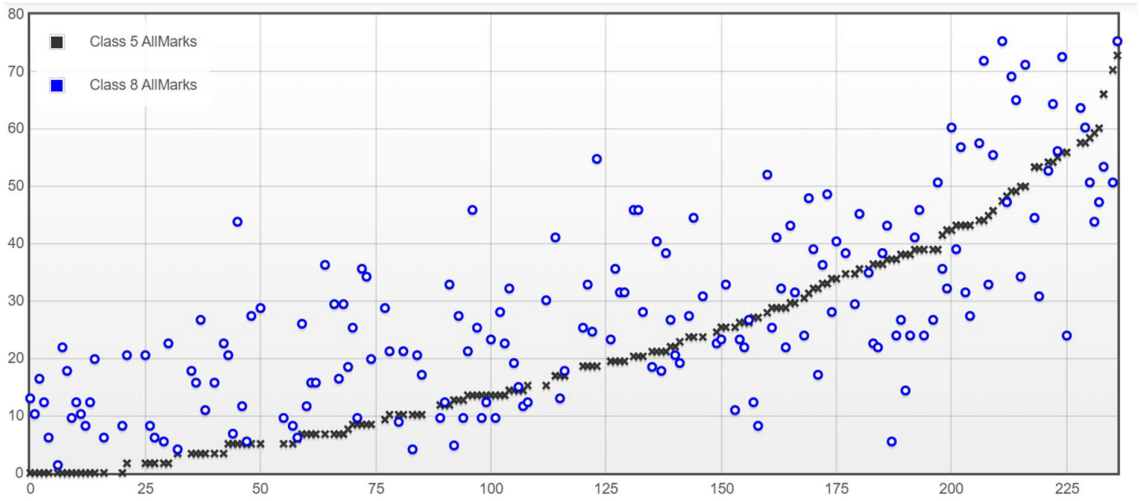
Do children who perform well at a young age continue to perform well as they grow older and vice-versa? If the performance varies a lot with the years, then again, we can dismiss educational performance as something temporary and random.

Here is the correlation of the students' performance between 2nd and 5th standard in the written assessments (average of English and Maths marks). We have taken students who were in 2nd std in 2021-22 and in 5th std in 2024-25. Note that because of Covid we could do assessments only for students who were attending our mini-schools in the year 2020-21. Even in 2019-20, we couldn't do the written assessments and in 2021-22, the oral assessments were conducted in April 2022 along with the written assessments. Further the written assessments conducted in April 2022 were deliberately made easier as the children were still recovering from the damage to their education caused by the long Covid break.



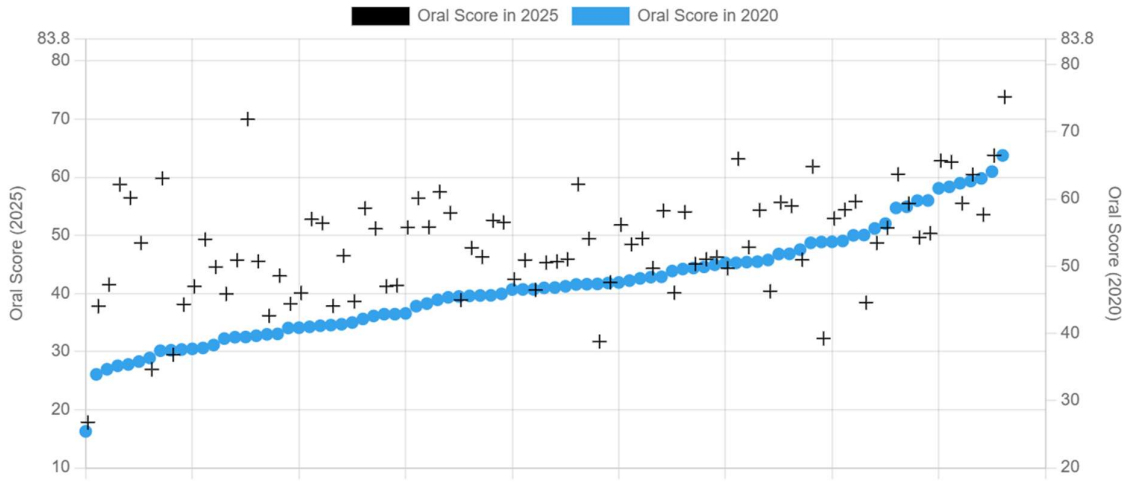
Correlation Value: 0.672

Here is a graph showing the marks of students who were in 5th std in 2021-22 and in 8th in 2024-25.



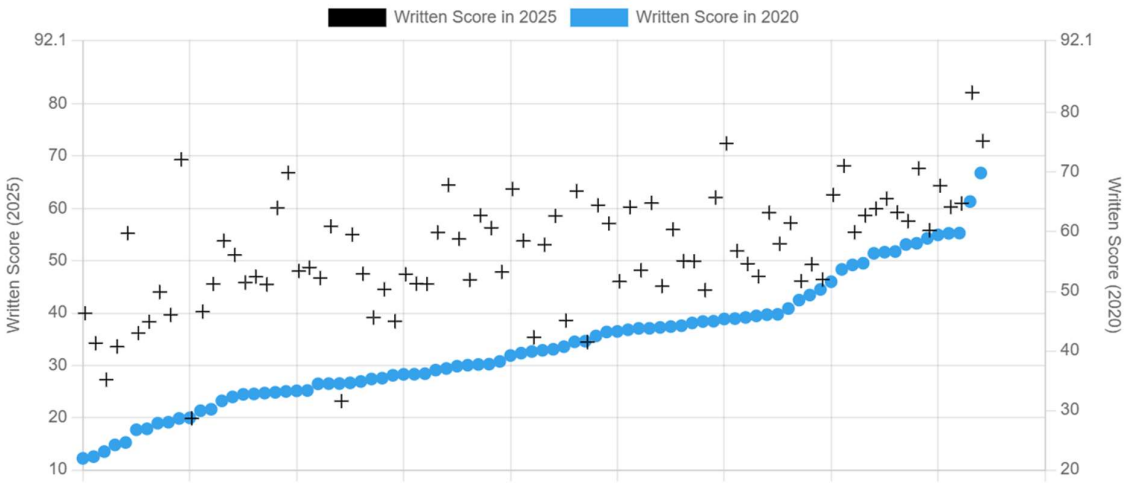
Correlation Value: 0.726

How about the performance at the school level? We have seen remarkable stability in the ranking of the schools even when pretty much all the teachers in the school have been replaced by new teachers. Here are the consolidated oral scores for the whole school in 2019-20 compared with that in 2024-25.



Correlation Value: 0.51

And here is the consolidated written score across the same two years.



Correlation Value: 0.60

As you can see the school performance also remains highly correlated across several years.

1.5 Educational Performance

As detailed in the preceding subsections, the educational performance of a student or a school is something that remains highly correlated across subjects, methodology and time. This begs the question why are some schools and some students performing better than others. Are there factors that we can work on that will improve the learning levels of the children.

In the "Factors that Affect Education" post, I identified the following factors as having bearing on educational performance.

1. Natural Ability.
2. Sociological Factors.
3. School and the teachers – their numbers and their input quality.
4. Education System in the school or state.

Read the blog post for more discussion on these. Here we present the data that the blog post used.

2. Sociological Factors Affecting Education

In the following sections, we study the impact of the the following factors on the education of the children.

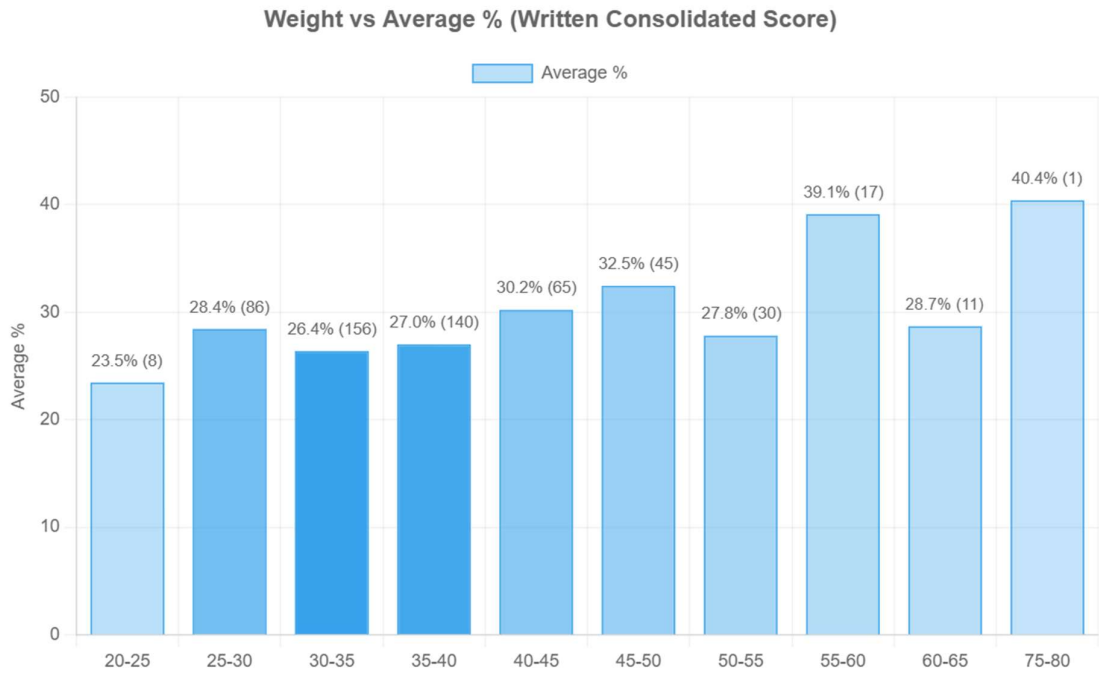
1. Parents Education.
2. Nutrition/Growth measured in terms of Height/Weight/BMI.
3. Distance to School
4. Regularity with Homework.
5. Preschool education of the students.
6. Gender.
7. Percent of SC/ST students in the school
8. Percent of BPL families in the school.

2.1 Nutrition/Growth measured in terms of Height/Weight/BMI.

We have been measuring the height and weight of the children taking the assessment. Based on these we can also compute the BMI of the students. We then correlate it against the performance of

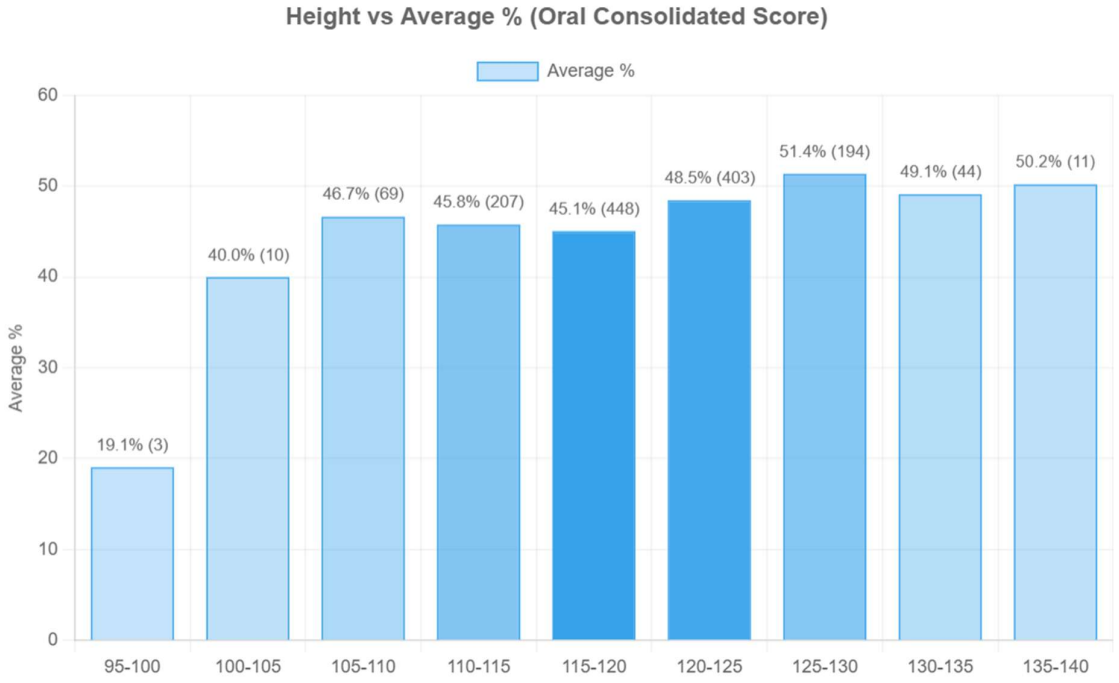
the children. As we are looking at the absolute score rather than the broad rank, we can only do this for a single class at a time.

Here is the correlation of the consolidated written score with Weights for class 8 students.



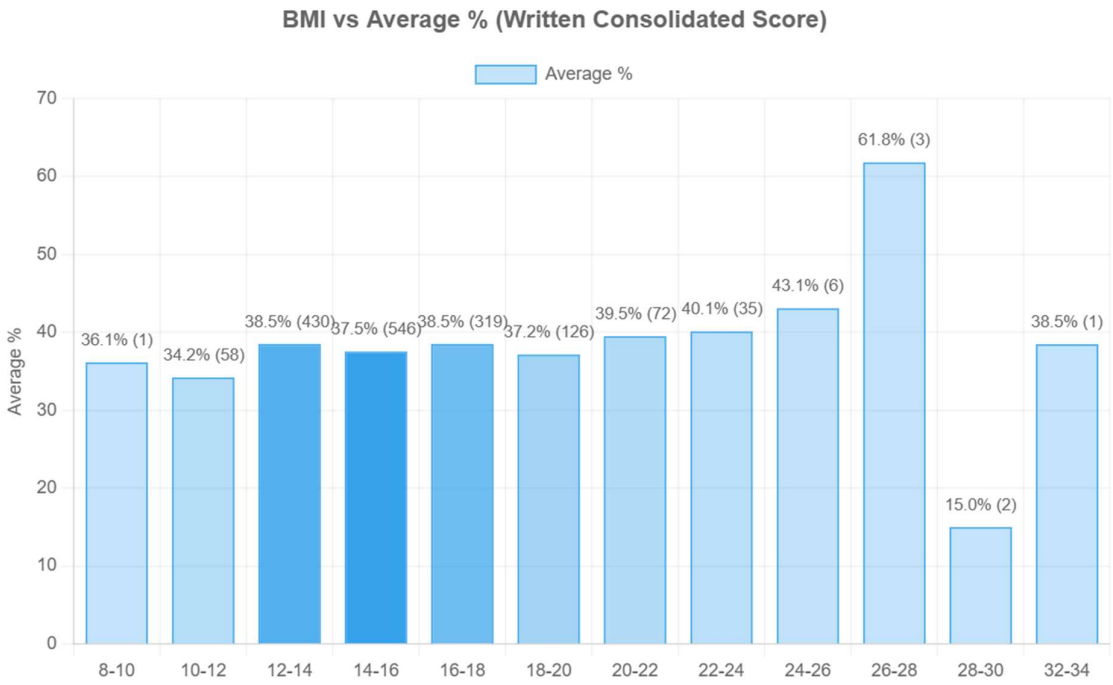
Correlation Value: 0.11

Here is the correlation of the consolidated Oral score with Height for class 3 students.



Correlation Value: 0.11

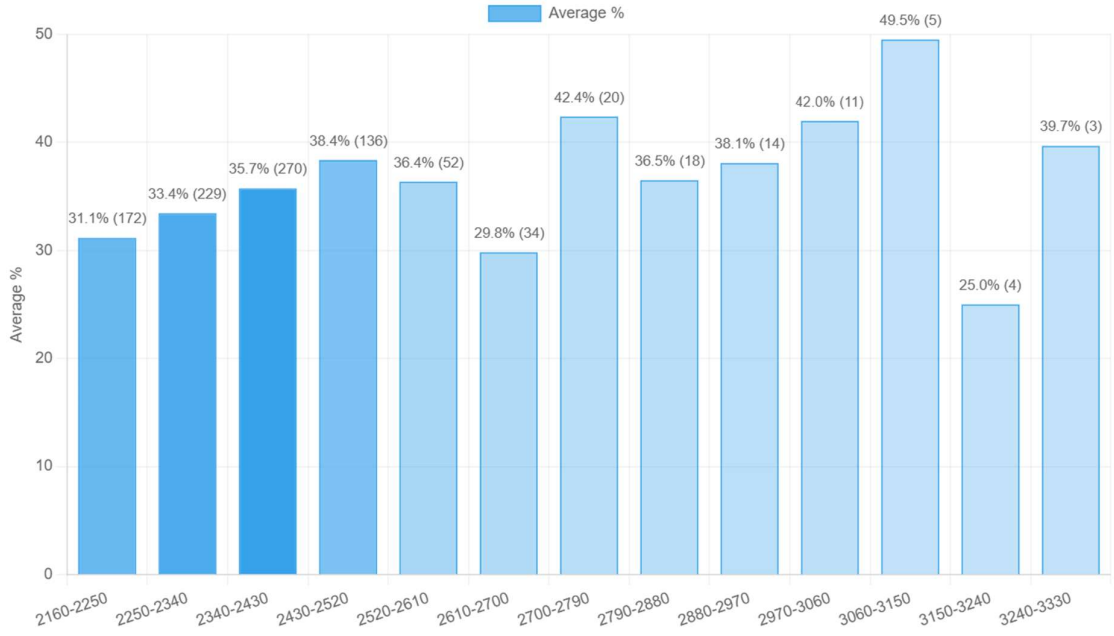
We noticed that there is only a weak correlation with Height and Weight. We expected better correlation against BMI as this would be a better measure of the overall development. And here is the chart for BMI against the consolidated written score for 5th standard.



Correlation Value: 0.03

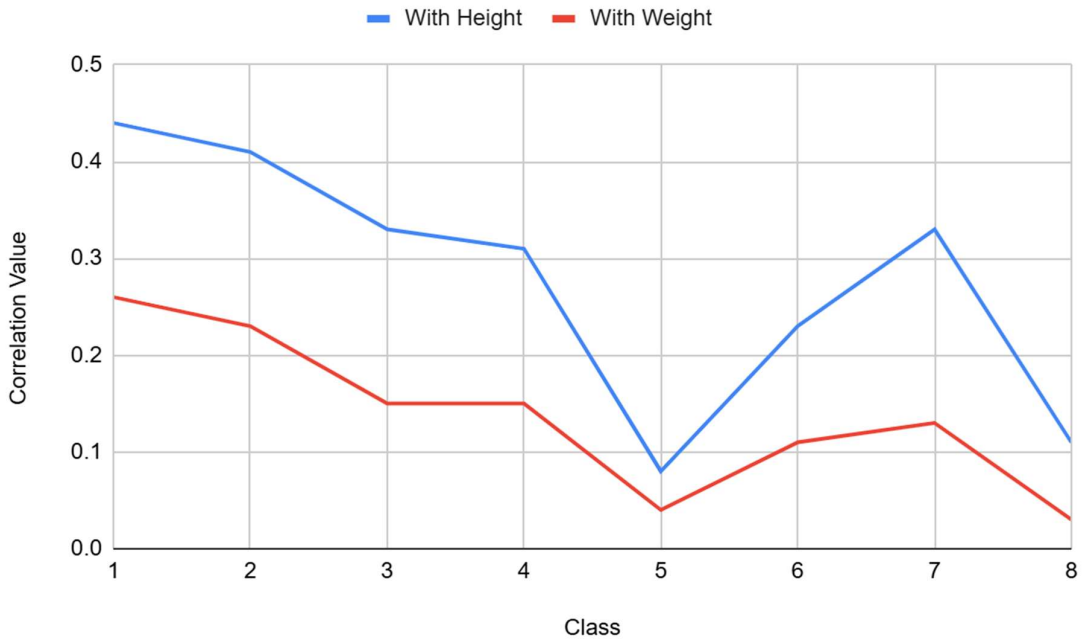
The correlation is even weaker. This may also be because the BMI is even more closely clustered towards the mean as you can see from the sample sizes given in the bracket.

Even this weak correlation for Height and Weight may be explained by other factors and not nutrition. It is well known that older children do well within a class. Here is the chart that shows the performance of the children in class 2 in 2024-25 plotted against the age (in days).



Correlation Value: 0.09

Further the height and weight are well correlated against the age within the class. Here are the correlations for height and weight with age for all classes.



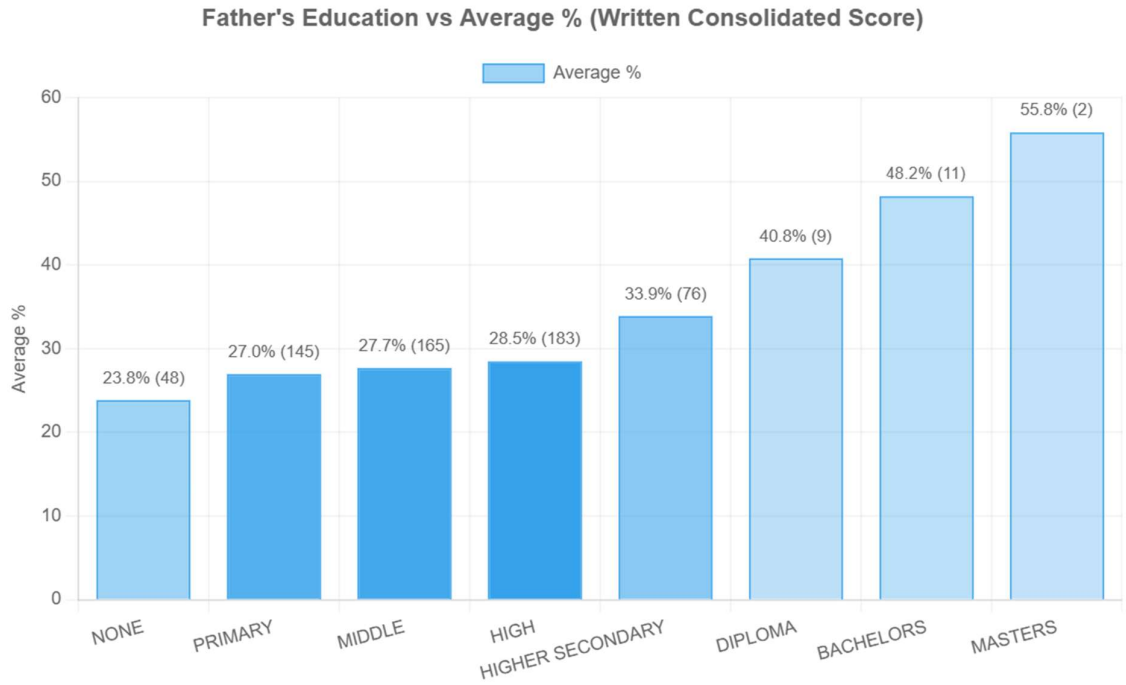
As one would expect the correlation is high for younger classes and drops for higher classes both for performance against age and for height/weight against age. But somewhat unexpectedly, it dips for 5th std and goes a little high for 7th std. We have no idea why this may be the case.

But more importantly, for most classes this is greater than the correlation that height and weight had with performance. Therefore, on the whole the correlation of educational performance doesn't seem to be influenced much by the factors related to the nutrition of the child which was not what we expected. It requires greater study.

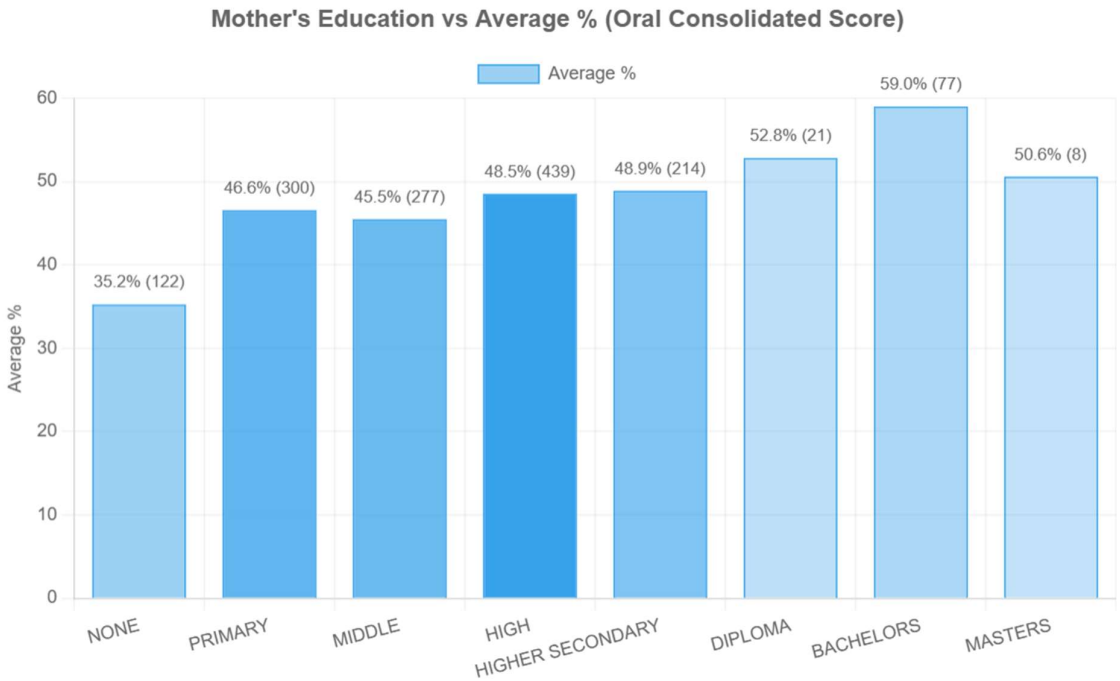
2.2 Parents' Education.

For the parents' education we are not recording a simple numerical value (like years of education). But are getting the following values for each parent: None, Primary, Middle, High, Higher Secondary, Diploma, Bachelors, Masters. That indicates the highest level of education that the parent has completed.

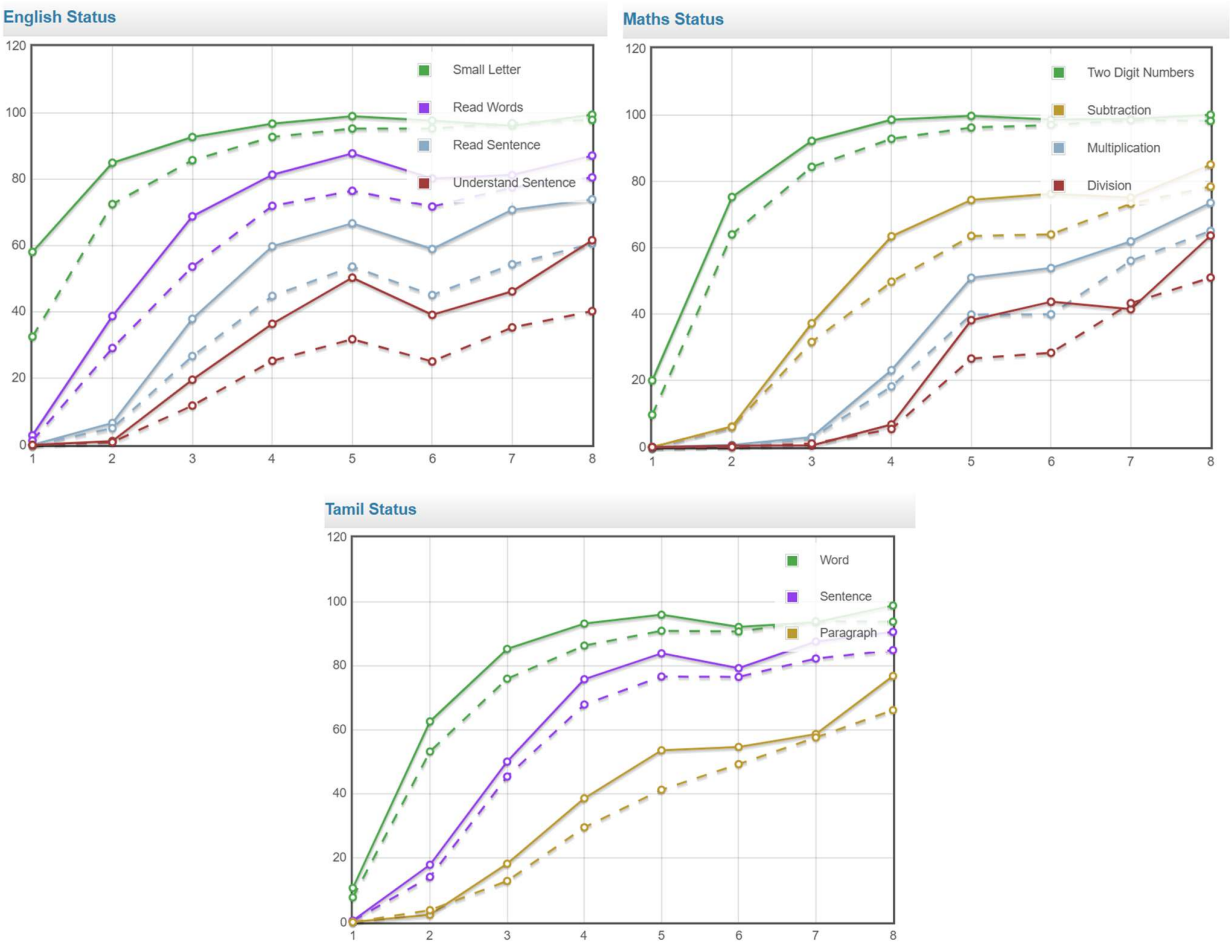
Here is a plot of the average written scores at class 8 plotted against the learning level of the father.



Here is the average oral scores of class 3 students plotted against the learning level of the mother.

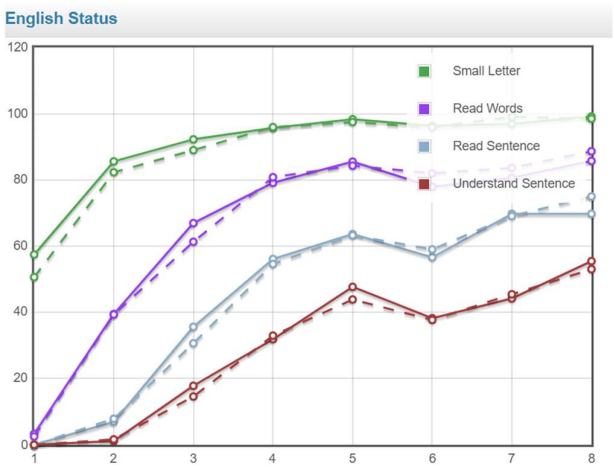


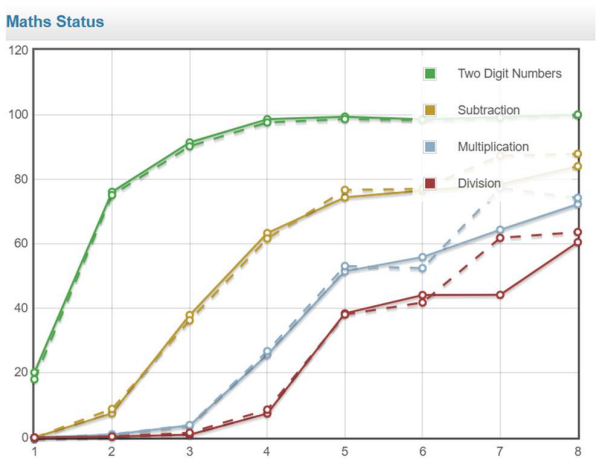
Another way to look at this is to compare the performance of students whose mothers have greater than 12th std education vs those whose mothers have less than 12th std education. Here is a chart that shows the percentage of students in all classes 1 to 8 who have a certain skill level in English, Maths and Tamil. The thick line shows children whose mothers have completed 12th std and the dashed line shows children whose mother haven't.



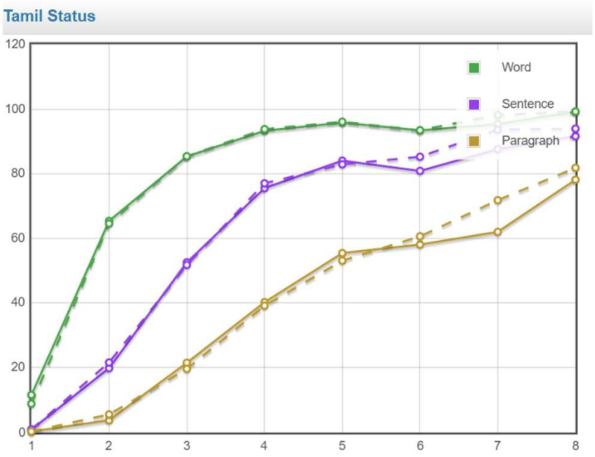
You can see that more 5th standard children whose mother have completed 12th std can read sentences than 8th std children whose mothers haven't! The graphs look very similar for father's education as well.

We also did another interesting comparison of children whose fathers have completed 12th std vs children whose mothers have completed 12th std. We have often heard slogans like "Educate a mother and you educate a family". So, we expected children with educated mothers doing better than those with educated fathers. See the comparison below. Thick lines represent students whose mothers have completed 12th and dashed lines represents students whose father have completed 12th standard.





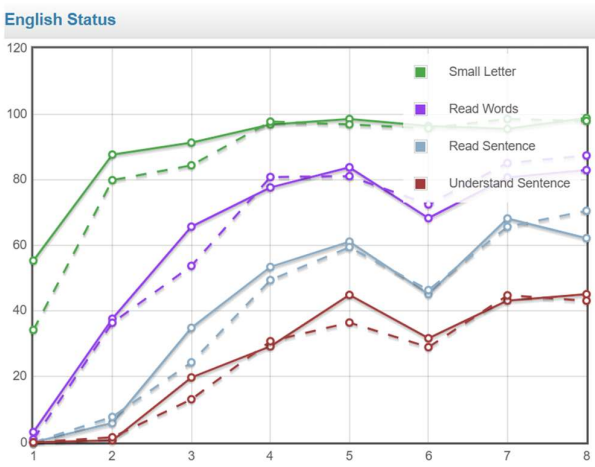
Class	Mother > 12th std	Father > 12th std
1	362	316
2	347	305
3	336	348
4	417	370
5	476	433
6	136	122
7	129	110
8	119	132

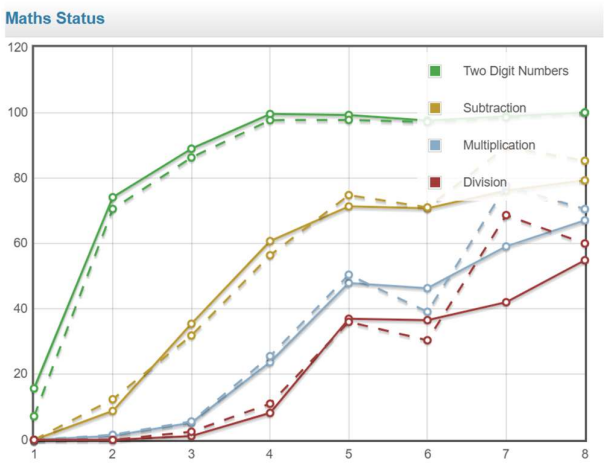


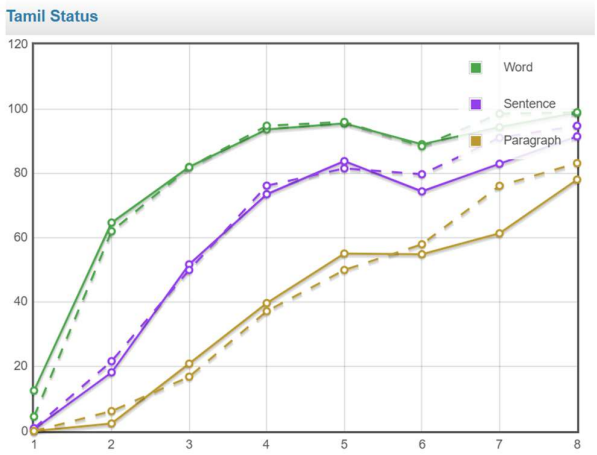
As you can see, in classes 1 to 5, children whose mothers have completed 12th std outperform children whose fathers have completed 12th std by a small margin. However, after 6th std, children with educated fathers start outperforming by significant margin! We have no idea what the cause may be. Father being educated may imply greater wealth in the family or it may be more important in making education a key value in the family. We are not sure.

Also note that the sample sizes for educated mothers and educated fathers is about the same for all classes. In fact other than 8th std, the educated mothers outnumber the educated fathers in every class. BTW the reason for a big drop in the count of both fathers and mothers from 6th std onwards is because many of the children go to high or higher secondary schools for 6th std and above which we do not support.

Here is another more filtered look at the data. In the following graphs, thick lines represents students whose mothers have completed 12th but whose fathers haven't versus dashed lines which represented students whose fathers have completed 12th but whose mothers haven't.



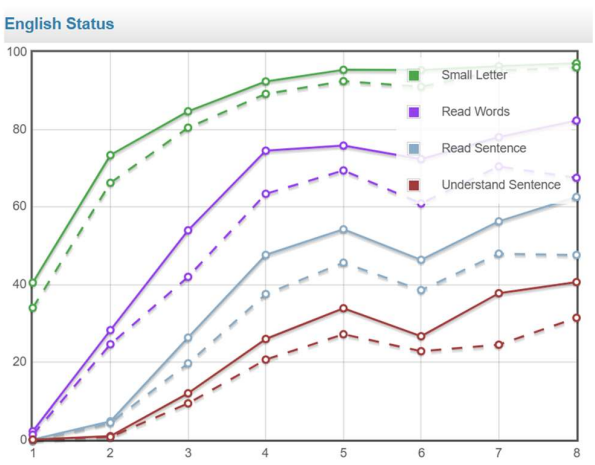


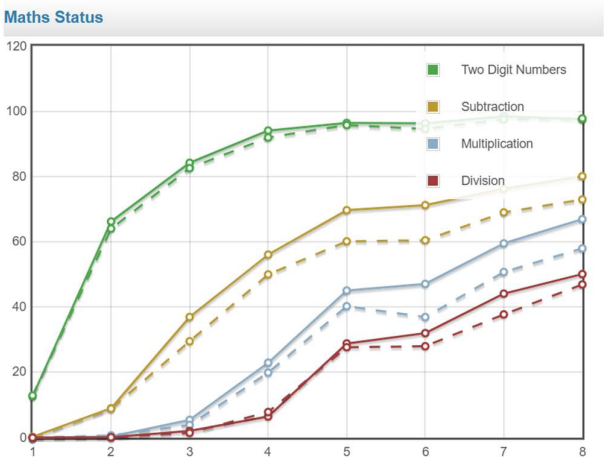


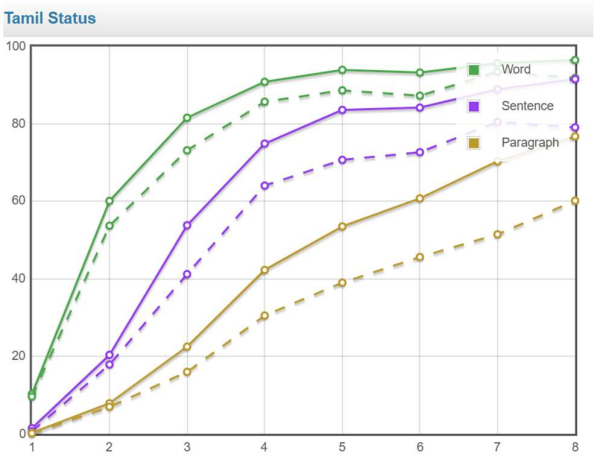
We see the same behaviour here as well. In primary school mothers' education makes the student perform slightly better. But in classes 6 to 8, students with educated fathers seem to perform significantly better! This is something that requires deeper analysis.

2.3 Gender

We have been finding right from when we started conducting the assessments that girls have been doing better than boys in all subjects and in all forms of assessments. Here are charts comparing the oral assessment performances of girls and boys. In the graphs, the thick lines show girls and the dashed lines, the boys.

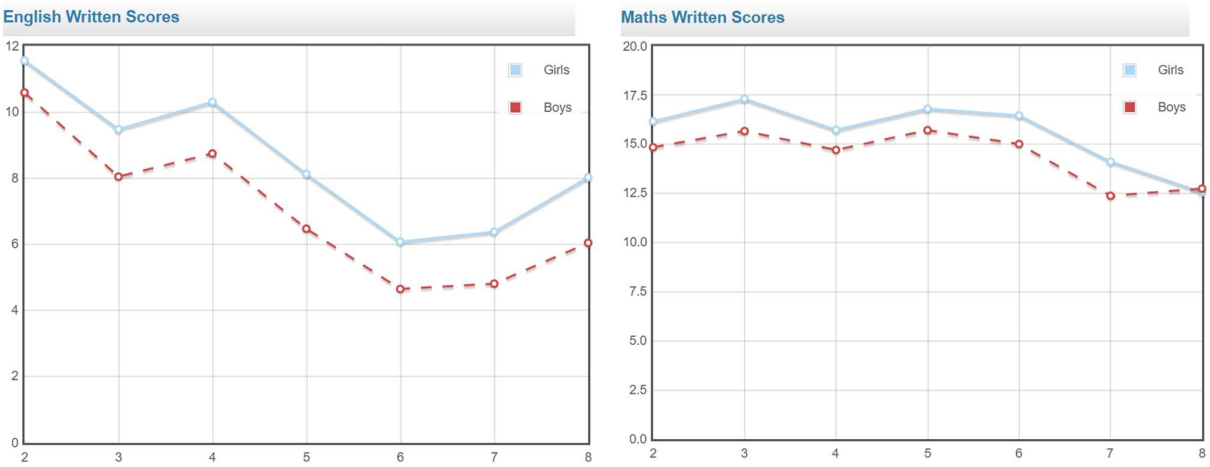




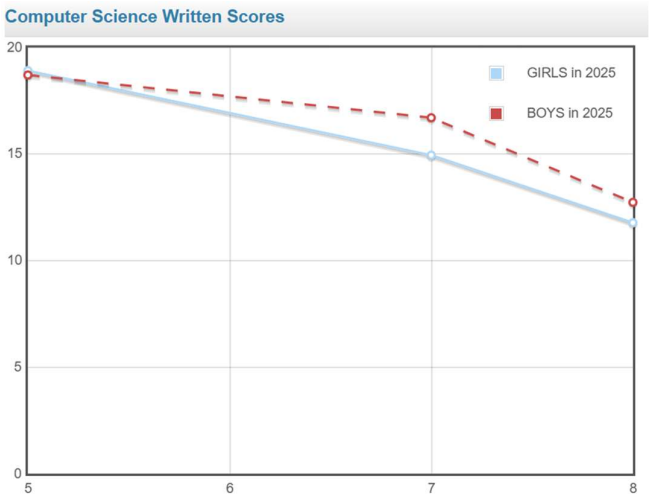


As you can see there is significant outperformance by girls in all classes, in all subjects and in all the various capabilities in those subjects. 5th std girls outperform 8th std boys in most English capabilities! We checked if there is a difference between TN and UP in this and there were none!

In written assessments, if anything, the outperformance is even more. The following two graphs show the average written scores of girls and boys in classes 2 to 8. Note that in this case, the marks in one class cannot be compared with another as the papers are different.



Here is a graph that compares the performance of children in our Computer Science assessments (only conducted for 5th, 7th and 8th stds).

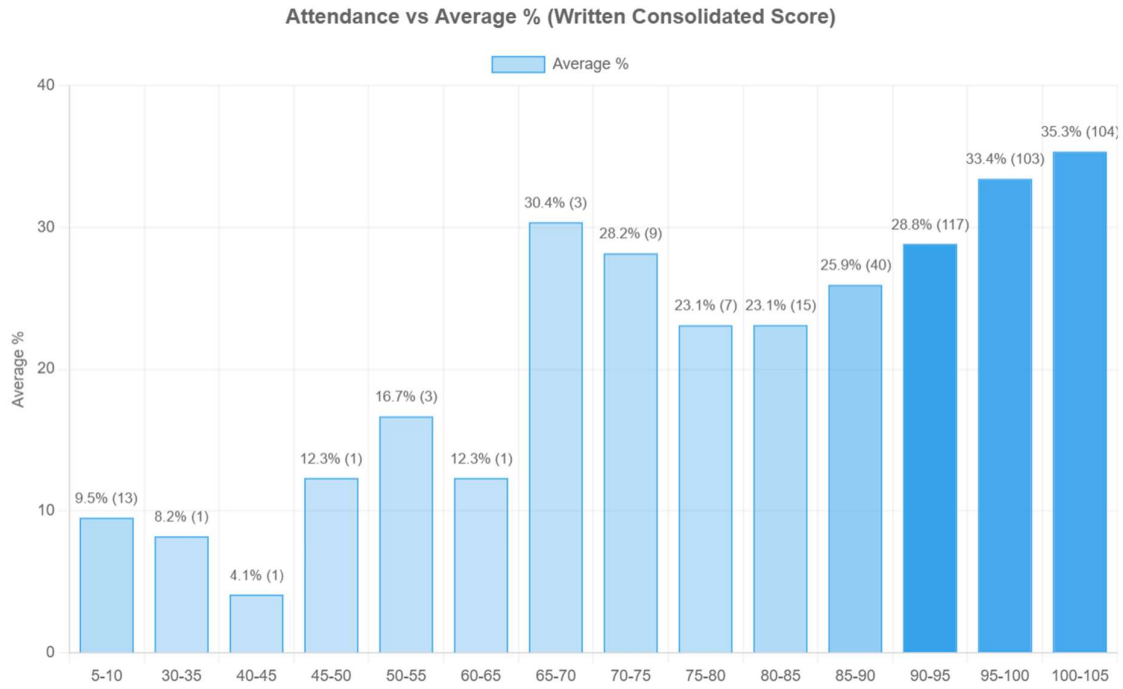


Computer Science is the only subject where the boys have outperformed the girls. My theory is that this is because the tests are conducted in a practical manner as opposed to the oral and written tests in English, Maths and Tamil. Our education system with teaching style that is largely oral and verbal and with its excessive focus on written assessments may be failing the boys!

There is one important factor to consider which may explain part of this difference. Families tend to give higher priority to boys' education and therefore more boys are in private schools and more girls are in government schools. Among richer families, this will be more pronounced. See some of the analysis under the "Interplay between factors" subsection below.

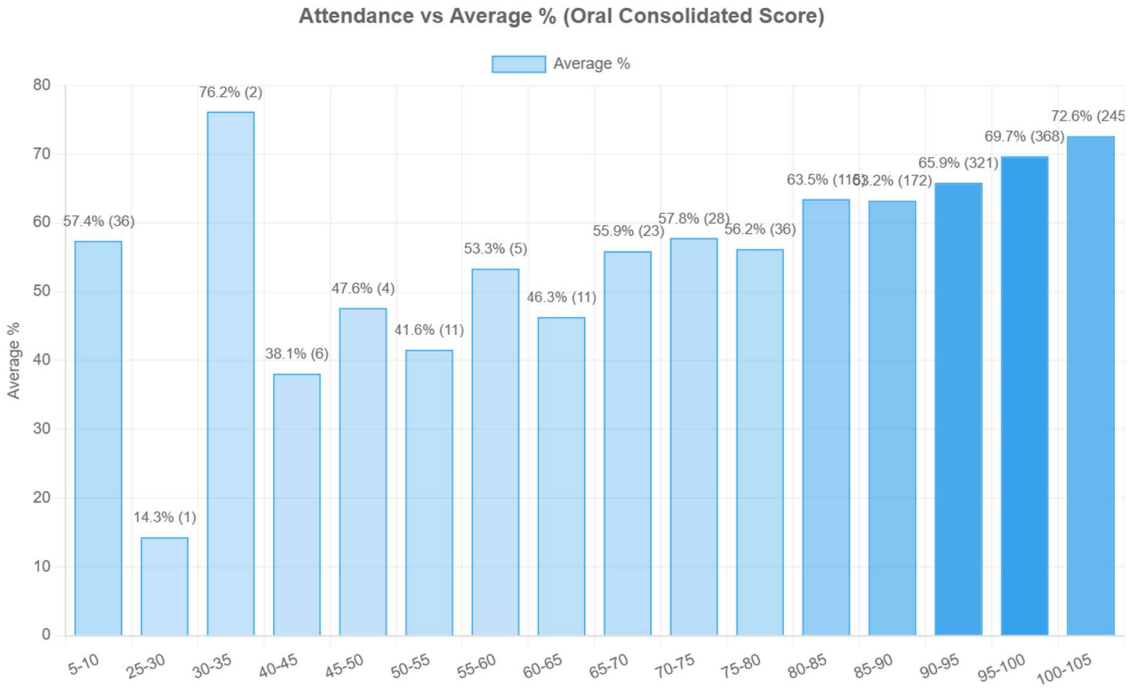
2.4 Attendance

Attendance is clearly one of the most important factors in determining how the students perform. Low attendance means they are not learning on the days they miss. In addition to that, low attendance also often means the family or community places less value on education. Here is a graph correlating performance of 8th std students in the written assessments with attendance. Note that attendance values are clustered in the 80% to 100% range. The sample sizes (given in the brackets) for lower attendance values are very small.



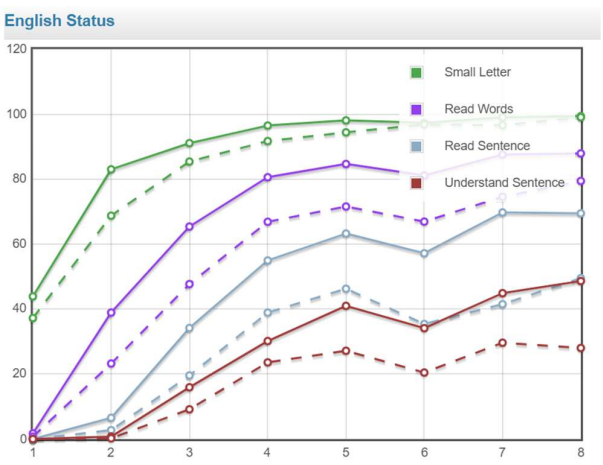
Correlation Value: 0.29

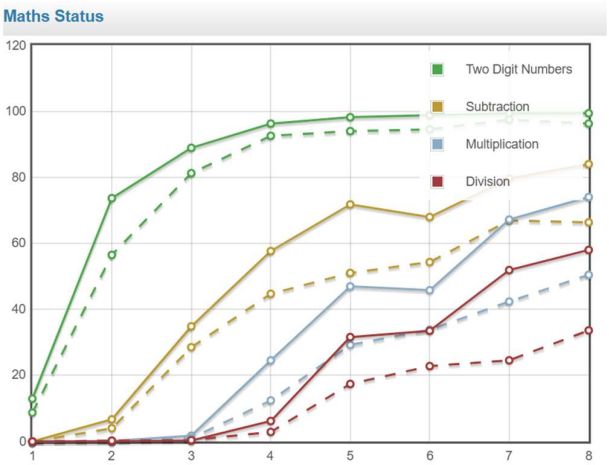
And here is the performance of 4th std students in oral assessments plotted against attendance.

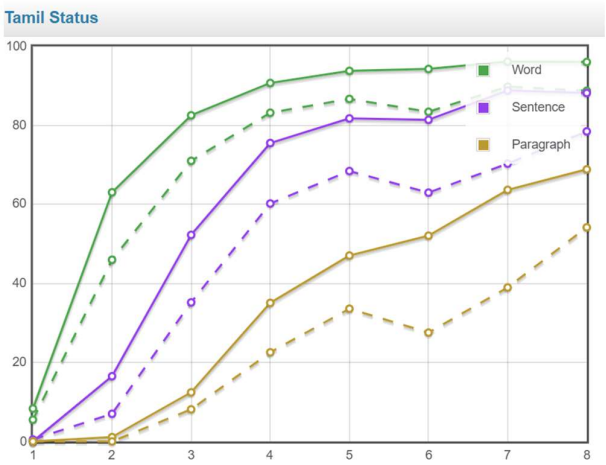


Correlation Value: 0.22

Another way to view this is to compare those with attendance greater than 90% (thich lines) with those whose attendance is less than 90% (dashed lines). Here are the percentage of students who have mastered various competencies by class for each of the 3 subjects.



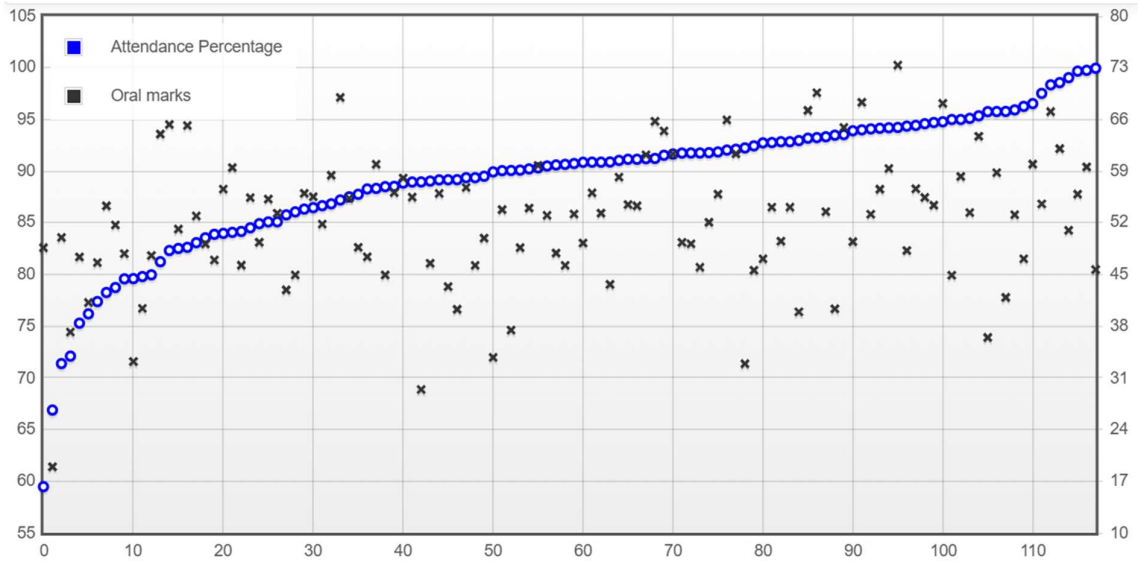




As you can see students with greater than 90% tremendously out-perform those who have less than 90% attendance. Almost in all capabilities, children in 5th std with good attendance outperform those in 8th std with poor attendance!

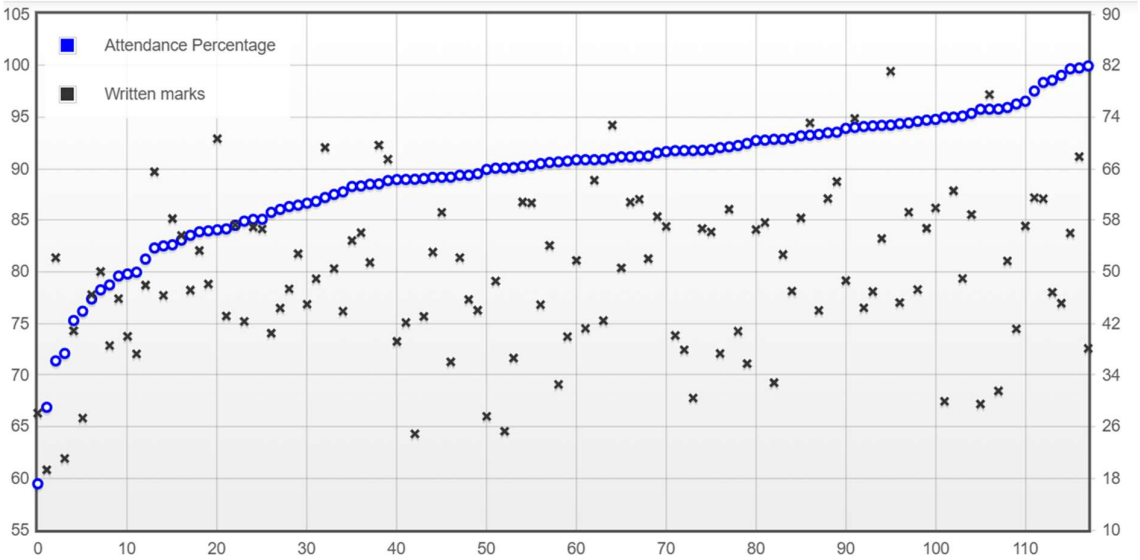
In personal visits, I have also seen how attendance affects the school as a whole. There are schools where attendance is always around 70% for the school as a whole every day. These are typically communities that lack the value for education. The children in these schools are often tardy and come late or do not bring the books/notebooks properly to the school (because the parents do not or unable to bother with this). Because of this, the school is permanently on a remedial mode. There will always be children who have missed the last couple of months of class. Teachers will not be sure whether to attend to them or the rest of the class.

Here is a chart that correlate the schools consolidated oral scores against the average attendance at the school. Note the attendance percent is shown on the left and the consolidated oral score expressed as a percent is shown on the right.



Correlation Value: 0.351

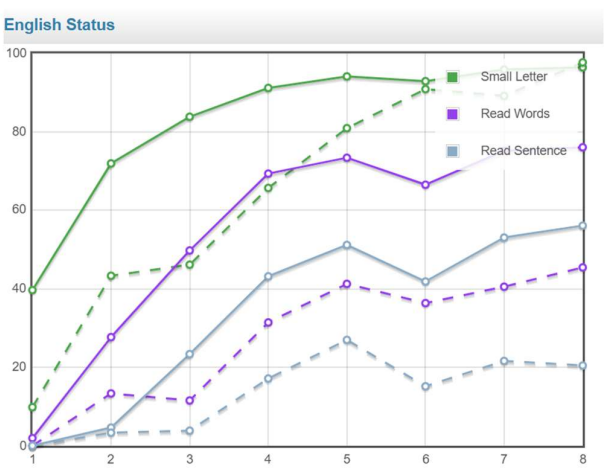
And here is a chart with the consolidated written scores.

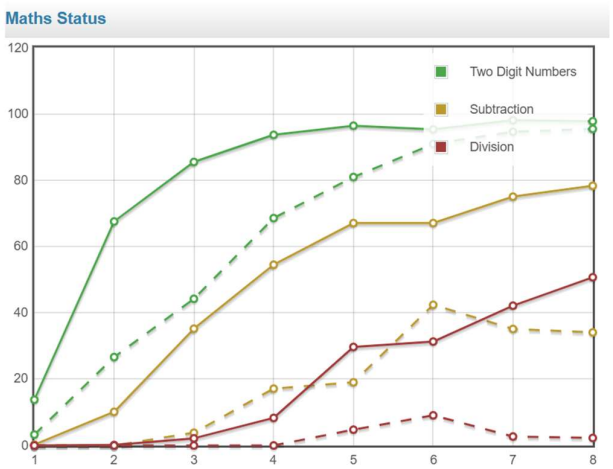


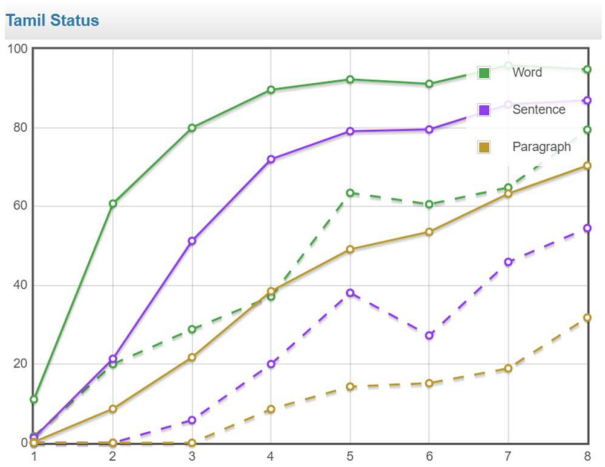
Correlation Value: 0.314

2.5 Regularity with Homework

Being regular with homework is another proxy for value for education. Parents who value education will ensure that the children are regular with the homework. Schools where children attend regularly and for most part do their homework assign some homework routinely. However our data collection in this regard has been very patchy/liberal. Of the 14811 students for whom assessment was conducted, for 4085 students data was not available. Of those for whom data was available, only 334 were reported as not being regular with homework. However, the difference between those who are regular with homework(thick lines) and those who are not (dashed lines) is just huge as the data below shows.







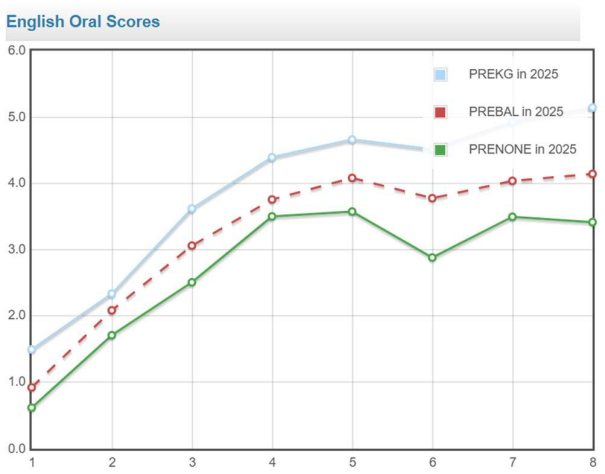
As you can see, even 3rd standard children who are regular with homework do as well as the 8th std children who aren't!!!

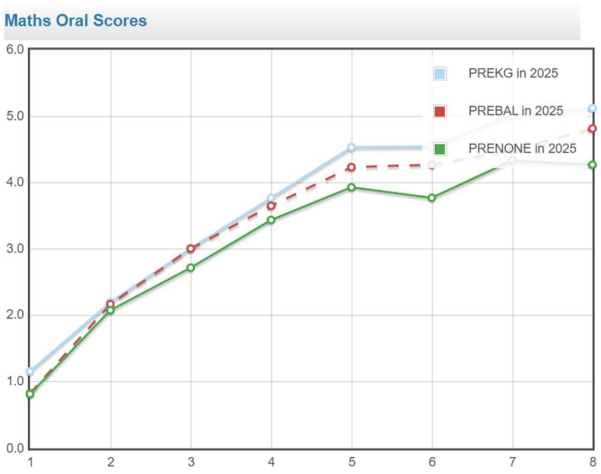
2.6 Preschool education of the students

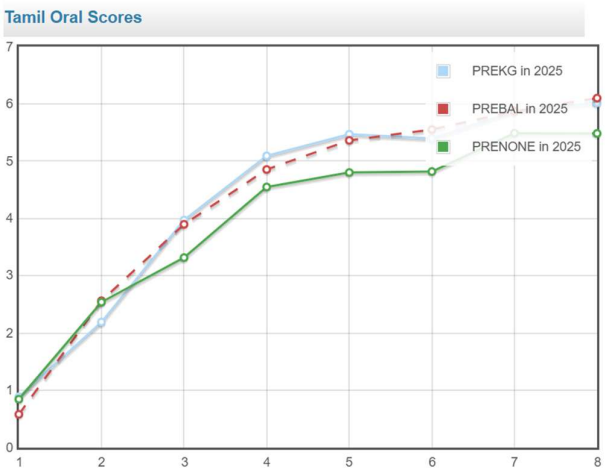
The students we assessed in the government schools in 2024-25, have the following Pre-school education levels:

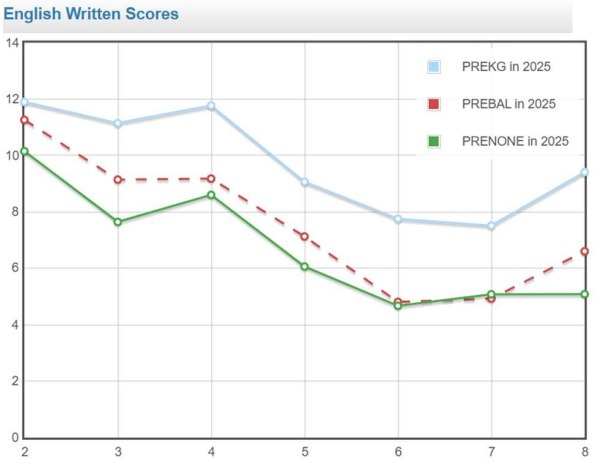
- Attended a private Kindergarten: 2811 students.
- Attended a government Balwadi: 8262 students.
- Did not attend any preschool: 1953 students.

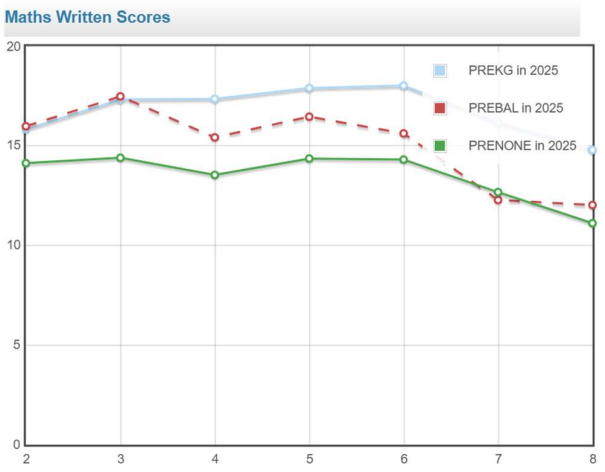
Here are graphs that compare the performance of these three groups of children in different assessments.

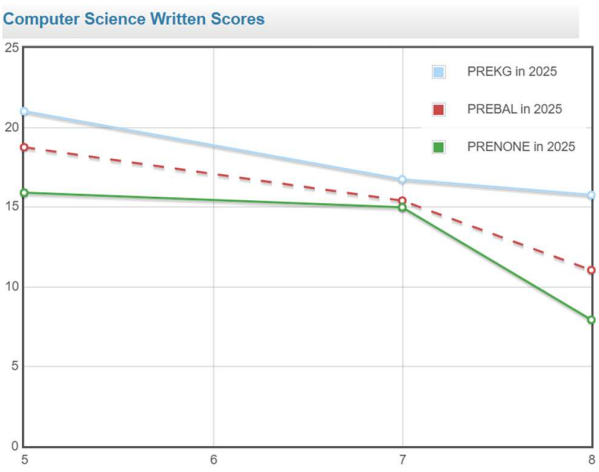












In English oral tests, the differences are stark. A 4th std student who went to KG does better than an 8th std student who went to a Balwadi. A 3rd std student who went to KG does better than an 8th std student who did not go to any preschool classes!

The difference in Maths and Tamil oral assessments is much more of a mixed bag. In written assessments, there is a significant outperformance by students who went to KG compared to those who did not. Interestingly, even in our own computer assessments, there is a significant outperformance by those who went to KG!

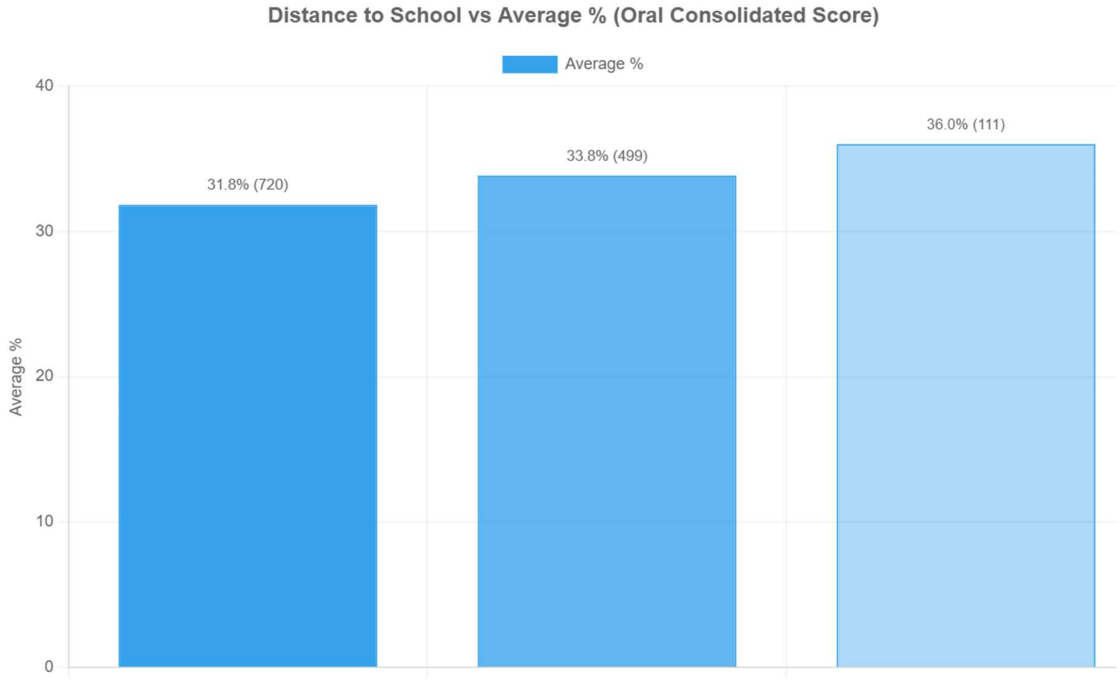
What explains these differences? Clearly what the children learnt in KG or Balwadi would make some difference. But we believe the much more important factor is the sociological one. The pre-school education is a proxy for financial/social status. Those who put the children in kindergartens were able to afford to pay for that for a couple of years. This also implies a certain value for education in the family which prioritised this expense. Children from such families which are better off and value education do better!

2.7 Distance to School

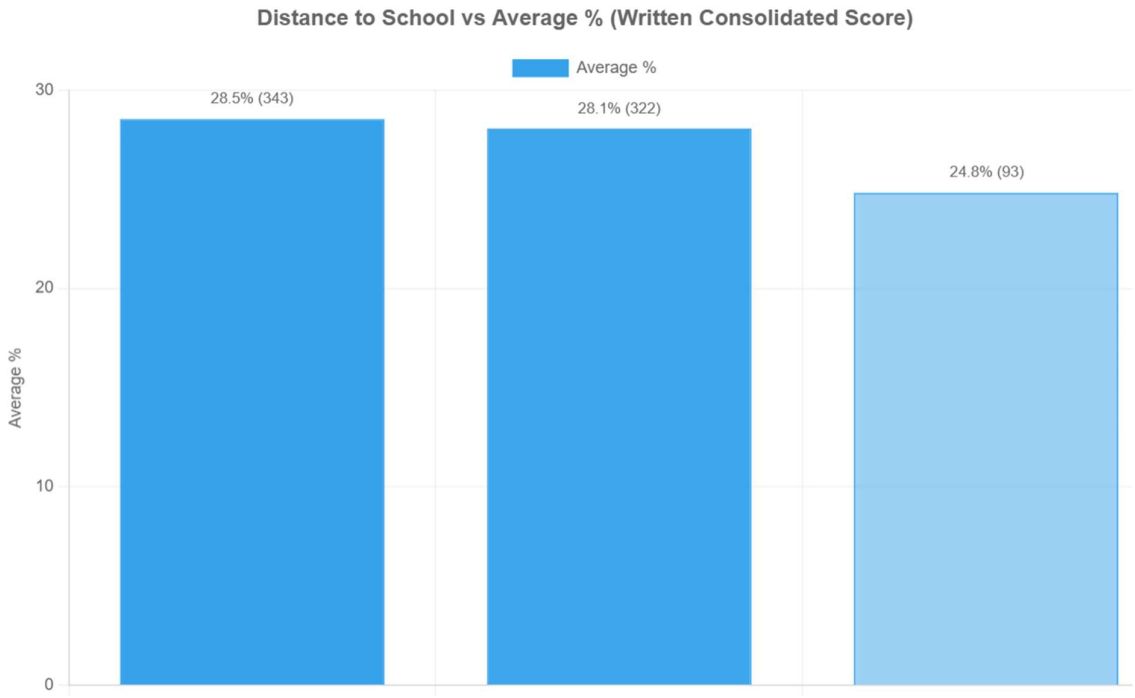
In the panchayat schools, we usually note that the schools are usually located in the upper caste/class hamlet within the panchayat. There are children who walk to school from adjacent panchayat. These are typically lower class/caste hamlets. Then there are hamlets which are further away from the schools and the children have to come either by bus or auto. Here is the number of students in each of these buckets in 2024-25.

- In the same hamlet as the school: 4562 students
- Come by walk from neighbouring hamlet: 5717 students.
- Come by bus or auto from a far away hamlet: 1344 students.

The comparison of the performance of these students didn't yield any clear pattern. However for younger children who are from further away hamlets were doing better but in older classes this reversed itself! Here is the chart for class 2 children.



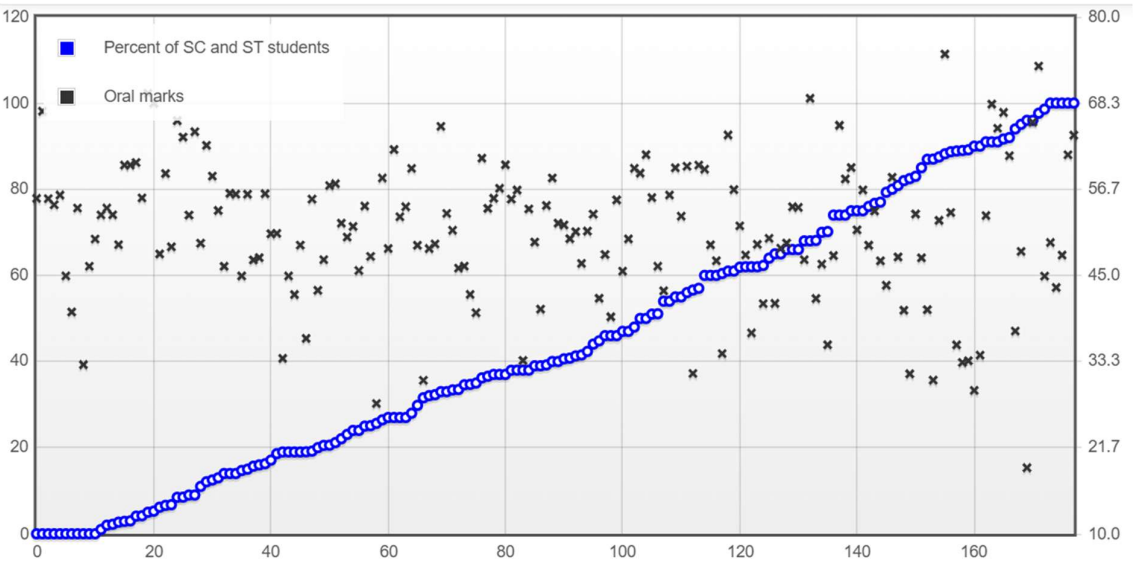
And here is the chart for class 8 children.



We have no idea what can be the factor here. This requires further understanding of the underlying data

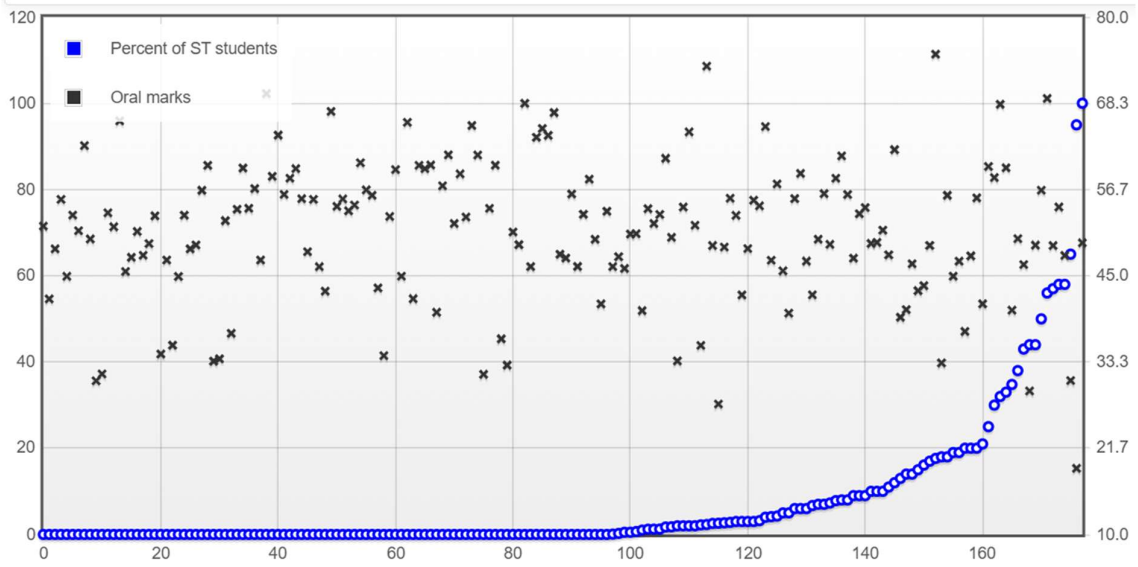
2.8 Percent of SC/ST students in the school

We have almost as a principle avoided asking the question about the student's caste. However, the government maintains this data and the overall data for the school is available through the UDISE database. Here is a graph that plots the SC/ST% (blue) and the schools weighted average oral scores (black).



Correlation Value: -0.128

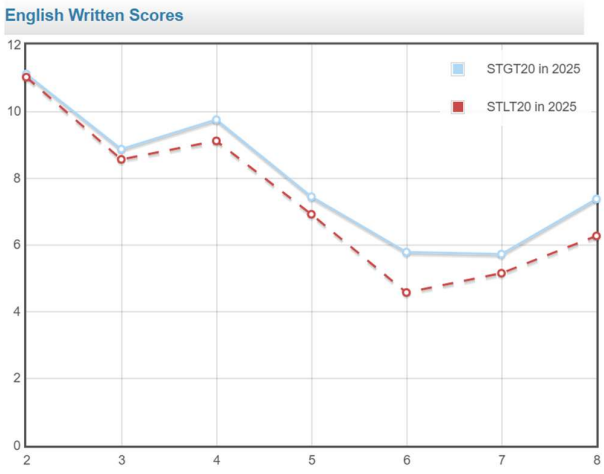
Here is a similar graph with just the percentage of ST students.

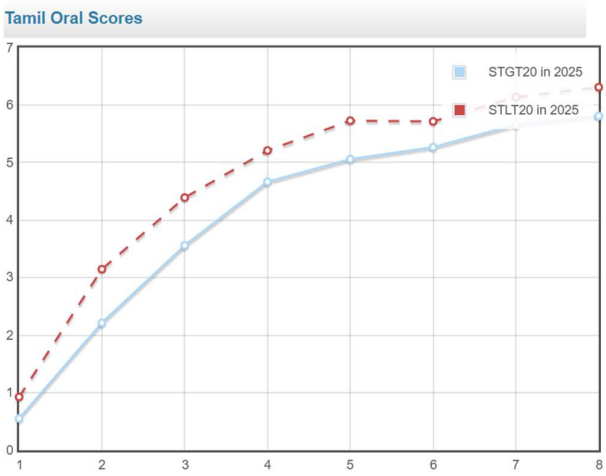


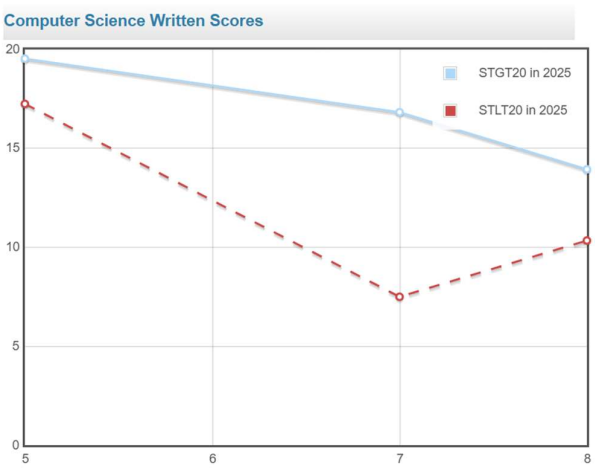
Correlation Value: -0.165

There is a negative correlation which is slightly stronger with the ST%. Broadly schools with lots of SC students seem to be doing similar to those with mostly non-SC students. Schools with high ST% seem to do slightly worse.

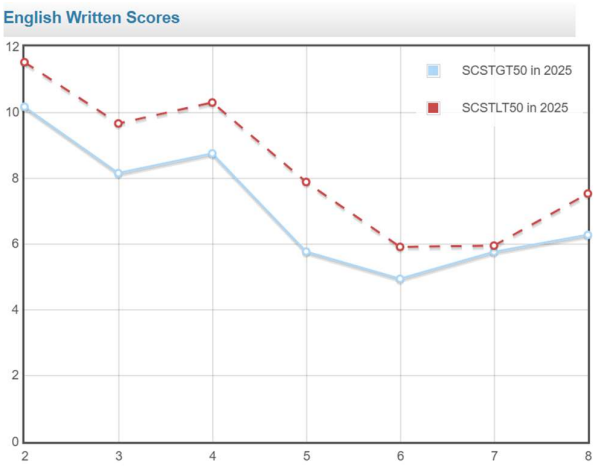
Here is another way to compare this. Here is the performance of students from schools with ST% greater than 20% charted against those with ST% less than 20%.

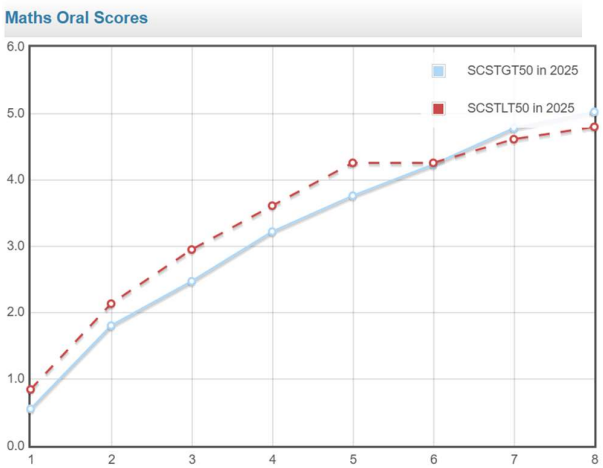


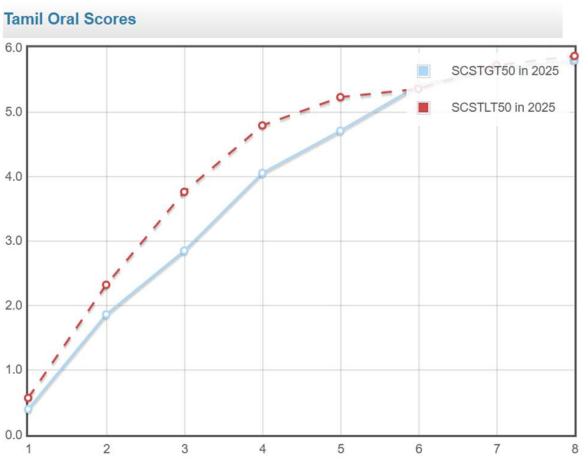




Note that the dotted red lines represent schools that have less than 20% ST students (167 of them) and the thick blue lines represent schools that have greater than 20% ST students (21 of them). As you can see there is absolutely no consistency in terms of performance. Similarly see the graphs below comparing schools with greater than and less than 50% SC/ST students.







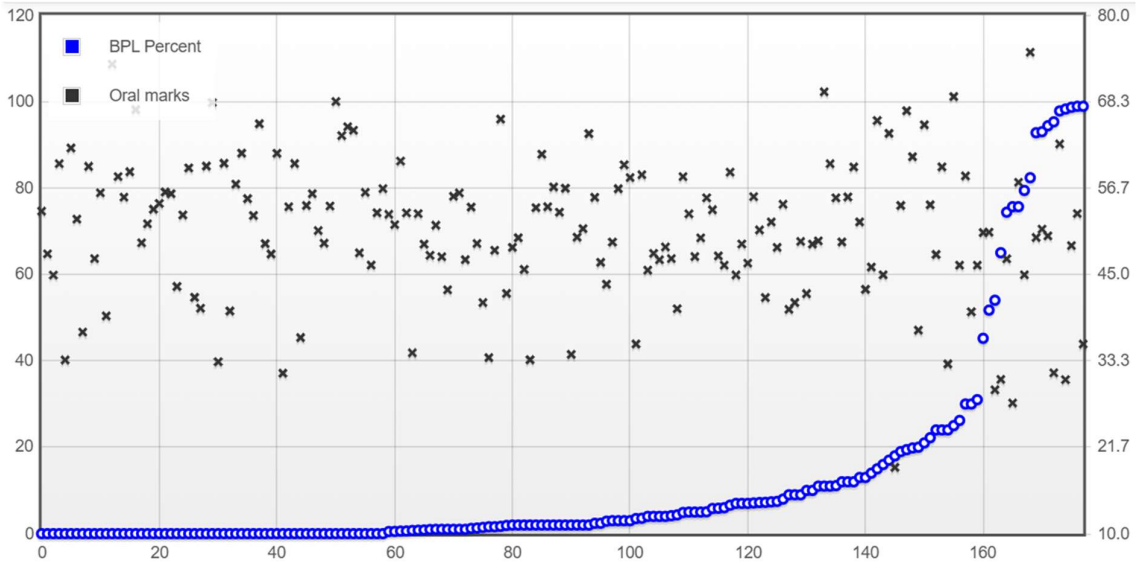
Here the schools with less than 50% SC/ST students (red dotted line) are doing better till 5th std but schools with greater than 50% SC/ST students (blue think link) are doing better in all subjects other than English in 6th to 8th stds including our own CS curriculum.

The presence of SC/ST students in large numbers do not seem to have any consistent impact on the performance of the students one way or the other. We haven't done any analysis at an individual level.

2.9 Percent of BPL families in the school.

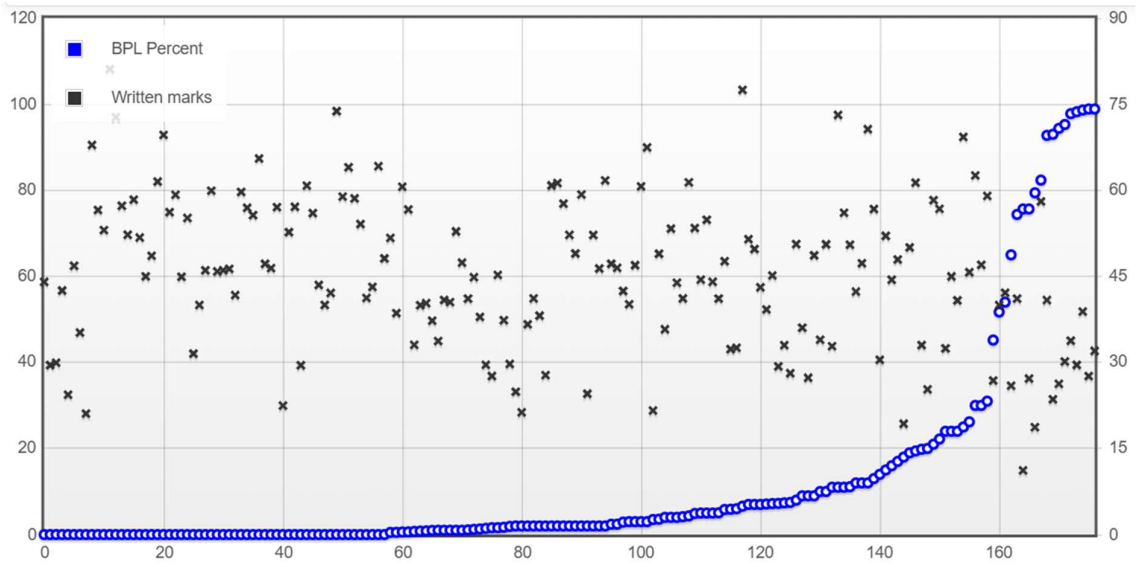
The percent of population below the poverty line (i.e. the families have the BPL card) is listed in the UDISE database. We thought that would yield interesting results till we learnt that the data in the UDISE database seems to be very wrong for many of the schools especially in Tamilnadu. The data in UP seem to match better. Further even the data at the Panchayat office is not very reflective is real poverty from the field level information I was able to obtain.

Here is a graph of the weighted average oral assessment score and the BPL% of the school plotted.



Correlation Value: -0.165

And here is a correlation with the weighted average of the written assessment scores.



Correlation Value: -0.326

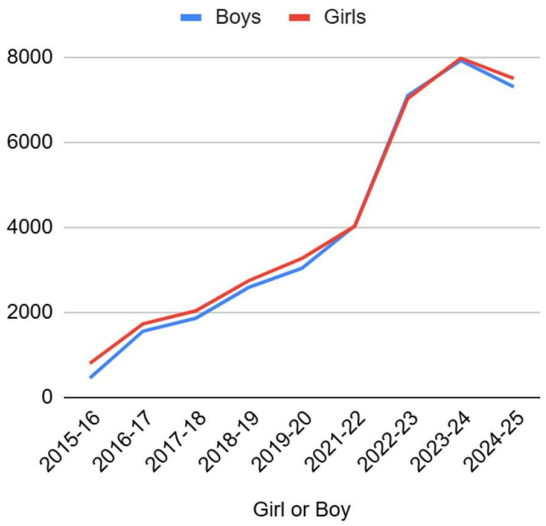
There is some negative correlation as one would expect especially for the written assessment scores. Given the low confidence in the data, we can read much into this. We hope we get better quality data regarding BPL. For now, we are relying more on things like where the students went for their preschool as a proxy for the wealth (as well as value for education) of the family.

2.10 Interplay between factors

The sociological factors do not operate in isolation. They have strong connections with each other and have an even greater influence on the educational outcomes of the children. Here are some things we have looked at.

2.10.1 Gender

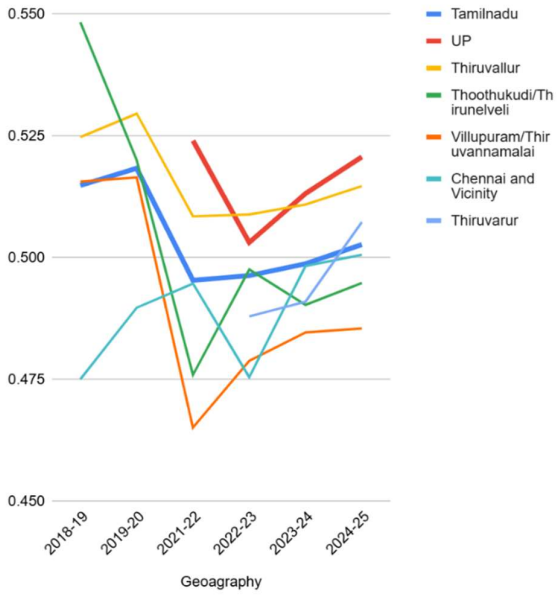
In general, the number of girls in the government schools have always been more than the number of boys. You can see that the number of girls and boys over the years at all our supported schools.



As the schools were all closed, we do not have any data for the 2020-21 academic year. Interesting side observation to be noted is that the number of boys overtook the number of girls immediately post-Covid. Over the last 3 years, it has reverted back to the usual pattern of there being more boys than girls.

Post Covid the government schools witnessed a huge increase in enrolment. This was most probably due to the financial hardships faced by the families. This I think also explains boys being moved back in greater numbers as there were more boys in the private schools to start with. In the years since 2021-22, children are being shifted back to private schools as the financial situation of the families improve. This is also the main reason why the overall number of students has dipped in 2024-25 compared to 2023-24 even though the number of schools increased a little. We are noticing a further dip in 2025-26.

Here is a breakup of the percentage of girls in our schools by area. In almost all the areas the gender ratio was a little above 0.5. It dipped below 0.5 or at least close to 0.5 during Covid and are returning back to the pre-covid levels now.



One place that has not behaved in a similar manner is Chennai. Here number of boys were always more than girls (sex ratio at birth is about 940 in both TN and UP). Are the families in Chennai more progressive and more likely to send their daughters also to private schools? May be! Another explanation can be that the parents who migrate into Chennai bring their boys with

them more often than their girls who are left back with their grand-parents. We cannot really be sure without deeper analysis.

Coming to the main point of this section, here is a table that captures how some of the parents' education and whether the students went to kindergarten varies with gender.

Gender	Mother Ed >= 12th	Father Ed >= 12th	Preschool KG	Preschool Balwadi	Preschool None	Attendance >= 90%
Girl	21.35%	19.72%	20.84%	64.4%	14.76%	64.45%
Boy	20.25%	18.39%	21.18%	63.04%	15.78%	61.8%

As better off parents will move their sons to private schools, we expected the sociological factors for the girls to be slightly better. Maybe they are as suggested by the parents' education being slightly better. But the different seems to be too weak to make a difference. Just as the parents spend money to put their sons in private schools, they also seems to be putting their sons in KG a little more often. The girls clearly attend school more often than boys. We see the difference in attendance in every class from 1st to 8th std as can be seen below.

The difference in attendance becomes significant in the middle school classes.

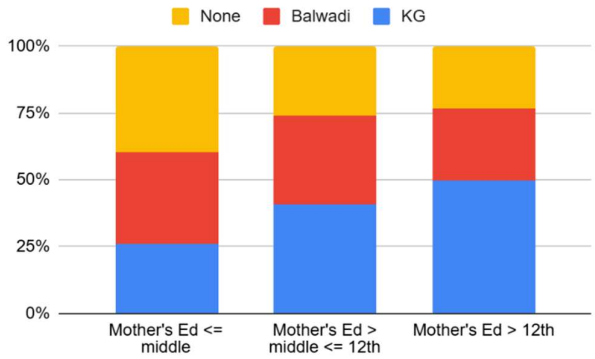
On the whole indirect effects of gender seem quite muted and indeed girls are doing much better than boys in our education system.

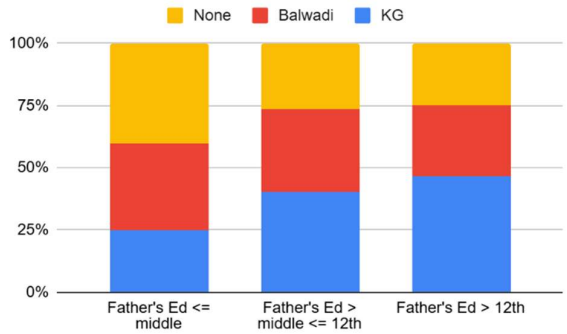
2.10.2 Wealth and Education of the Families

There are several sociological factors that indicate the wealth, social status and education in the families. Namely mother's education, father's education, the kind of preschool education the student had and whether the student is regular with homework.

As we can imagine, the mother's and father's education levels are highly correlated. They have a correlation of 0.54.

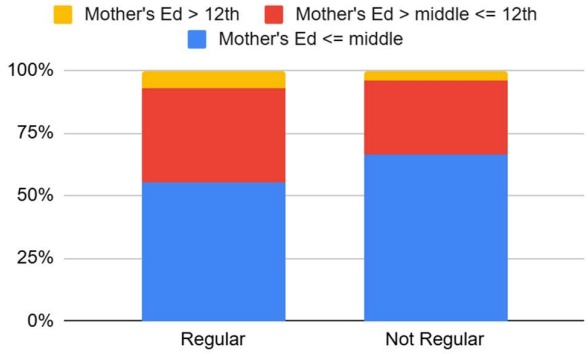
Lets look at how the preschool education is influenced by the parents' education.

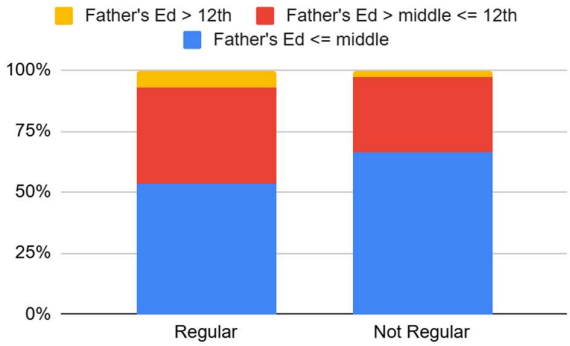




Mother and/or father being educated makes a big difference in the kind of pre-school education the student gets.

Here are graphs that show how parent's education influences whether the student is regular with homework or not.





Here again the parent's education has a significant relation with whether the student is regular with homework or not. We expected the children's attendance will also be influenced by parents' education. But there seems to be no such correlation.

2.11 Summing Up

We have looked at various social factors. Here is the summary of the findings.

Sno	Sociological Factor	Findings	Clarifications/Notes
1	Nutrition – Height, Weight and BMI	Weak or no correlation at all	Weak correlation with Height and Weight may also be explained with age (within a class) as it is well correlated with Height and Weight. Further study required.
2	Parents Education	Strong correlation with both mother's and father's education (which are further highly correlated with each other). Further influence through interplay with other factors like Preschool education and regularity with homework.	Further study required in terms of the differences between father being educated and mother being educated. Also details about the employment of the parents may add more light.

3	Gender	Girls always outperform boys except in CS. Variation in the sociological profile of girls and boys is not significant enough to influence this. We may need to bring on more practical learning (as opposed to just oral and written) and assessments so as to ensure boys are also learning well.	Oppression of women later in their life have several other causes and education (even at the college level and one generation earlier) is not a factor. Girls vs. boys being admitted to govt vs. private schools requires further study.
4	Attendance	Both at the student level and school level, attendance is a huge factor in determining educational performance.	More accurate measurement required and needs to be reported for most schools.
5	Regularity with Homework	Very strong correlation with educational performance.	Current measurement requires a little more nuance as most students are classified as being regular. Also details about how often the school gives or is able to give homework is not getting captured properly.
6	Preschool Education	Again very strongly correlated with educational performance. This is also highly influenced by parents' education.	Separating out the influence of actual learning achieved in the preschool vs. the sociological indication of coming from a wealthier family that cares about education requires further study.
7	Distance to School	Doesn't seem like a factor.	May require a little more nuanced study.
8	SC and ST percentages in the school.	There is a weak correlation with ST% and not so much with SC+ST%. However this also goes away in a straightforward comparison of students from schools with high ST% or SC/ST% with schools with low percentages.	We have deliberately stayed away from doing any caste-based analysis at an individual level as we believe this is not a direct factor but may be a factor indirectly in terms of parents' education, wealth of the family etc. We always felt it was simpler to study those factors directly.
9	Percent of BPL families in the school.	There is a good correlation despite the bad data.	The data is very suspect. Even the Panchayat level data is suspect. Further the data in UDISE is even more suspect.

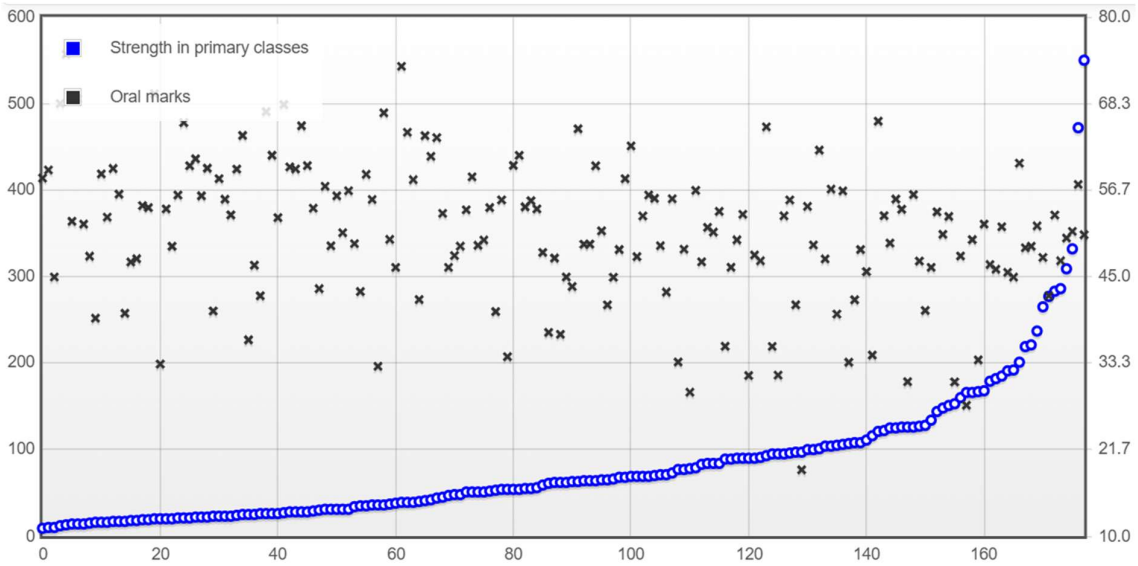
The family and the community a child is born into has a huge influence on the learning outcomes for that student even when the education is free like in the government schools. In the broader social context where people go to private schools based on their wealth and access to further options depend on entrance exams preparation which are even costlier, these sociological factors become paramount. Further the cheaper options for college where they exist are also merit based and end up excluding the most underprivileged. As we are seeing here merit is very much an aspect of priviledge!

3. Other Factors Affecting Education

Besides the sociological factors the “School and the Teacher” have a bearing on the education of the children. Further the management of the school and what is taught at the school also have a bearing.

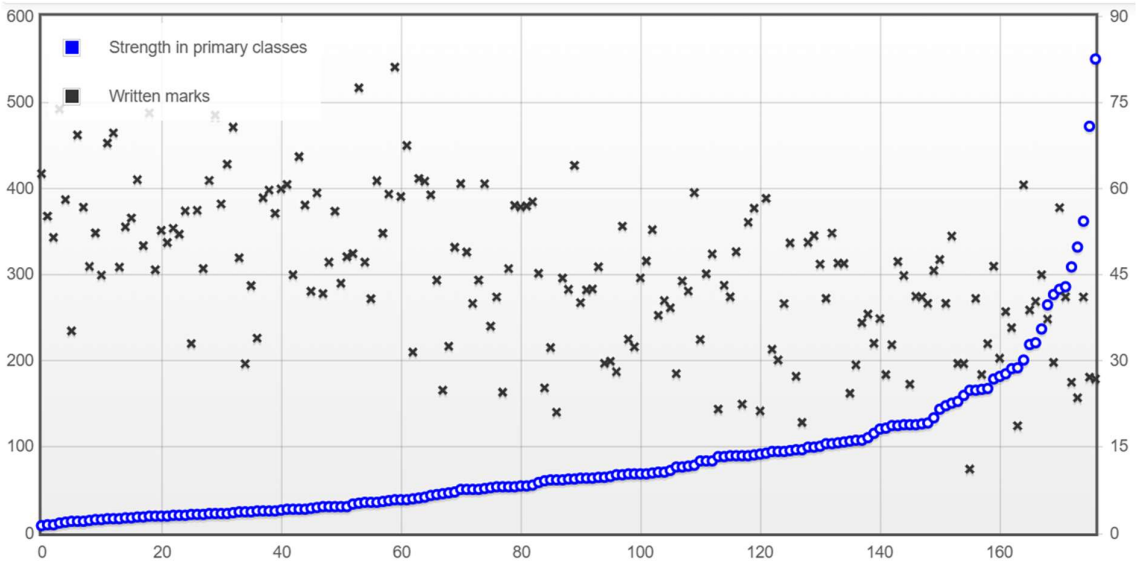
3.1 School Strength

Is it good for children to study in bigger schools or smaller schools? I have myself been a supporter of bigger schools because that allows for common facilities like a library, a play-ground, a computer or other STEM lab etc. However our own stats made me question that assumption. The following chart shows the performance of primary school children in the oral assessments (black cross, right axis) against the strength of the schools (blue circle, left axis).



Correlation Value: -0.189

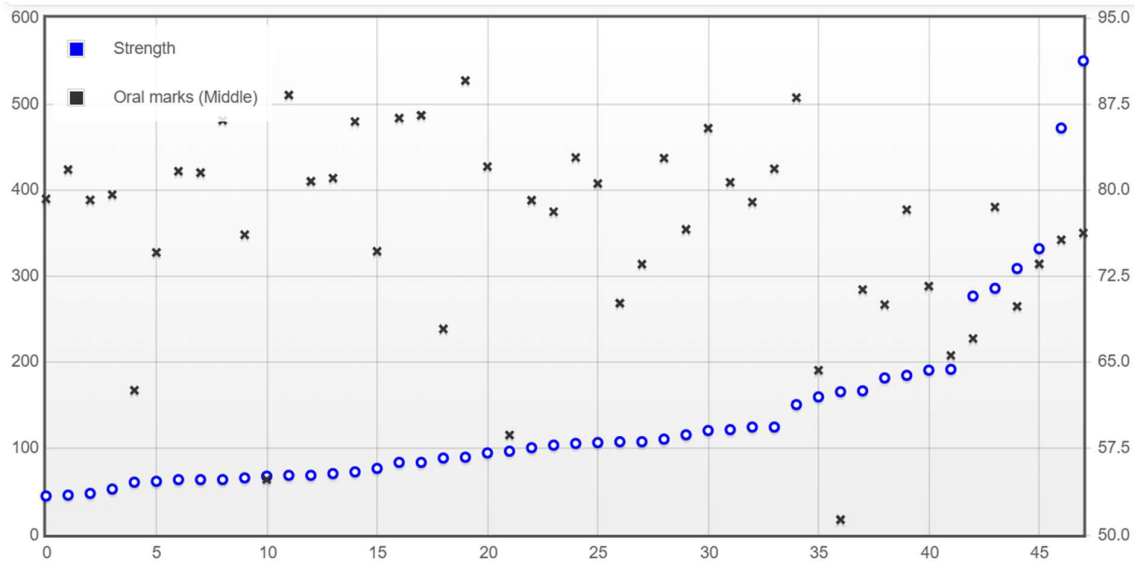
And here is the performance of all children (primary and middle schools) in written assessments against the strength of the schools.



Correlation Value: -0.435

Children do much better in primary school ages in smaller schools. The reason for putting this first was that this seems to be a bigger determinant that even somethings we assume to be the most important like having adequate number of teachers!

How do older children's performance vary with the strength of the schools. Here is the performance of children in classes 6 to 8 (black cross, right axis)in the oral assessment plotted with the strength of the school (blue circle, left axis).

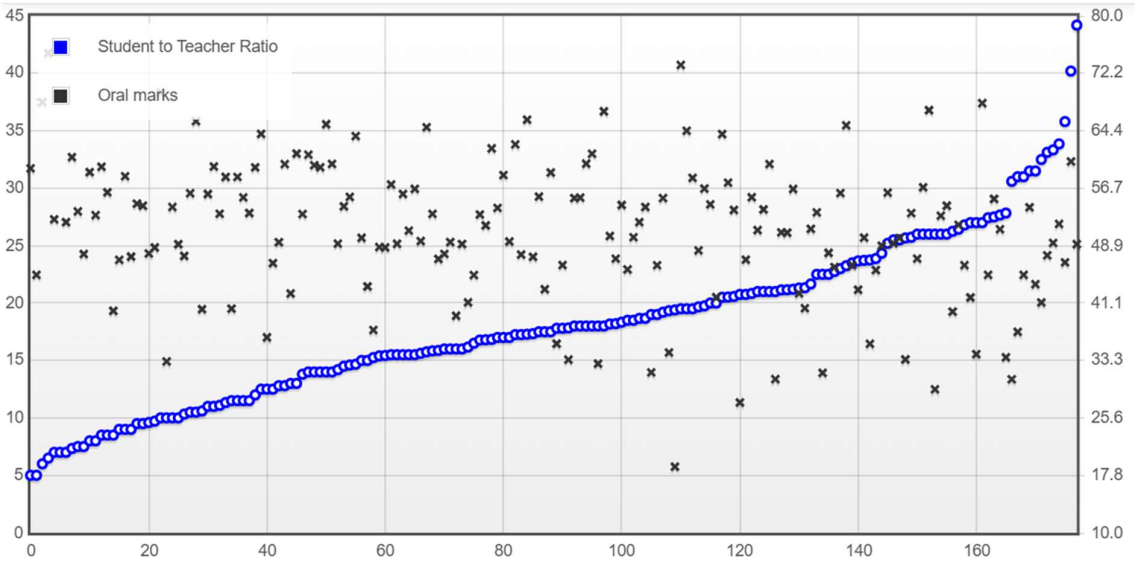


Correlation Value: -0.199

Children doing better in smaller schools persists even for older children just as much as for younger children!

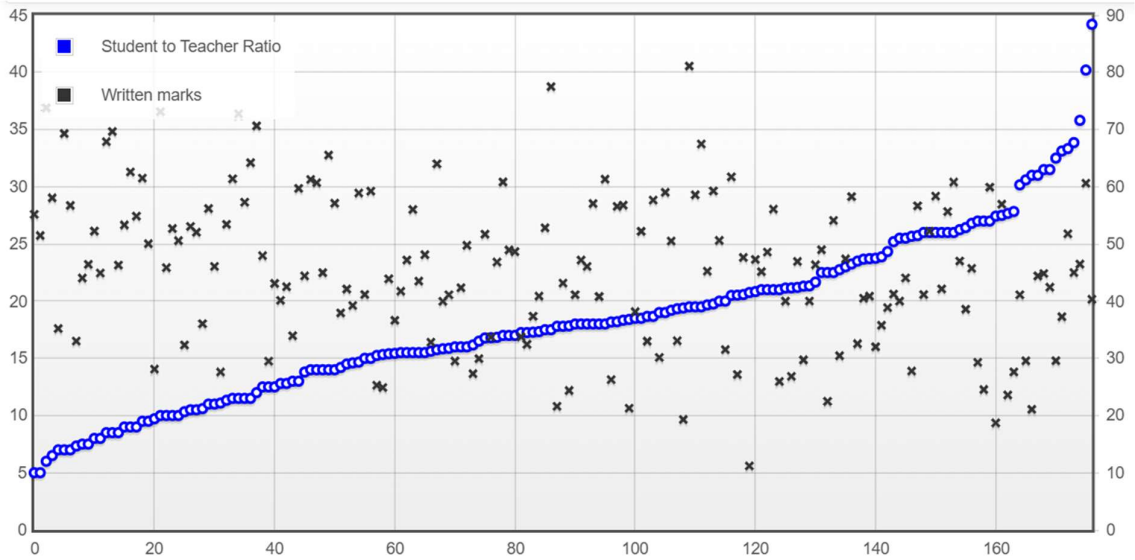
3.2 Teacher Student Ratio

Clearly having more teachers should be a good thing for education. How does the performance of students vary with the teacher-student ratio? Here is a chart that shows the average performance of children in classes 1 to 5 in the oral assessments (black cross, right axis) against the student teacher ratio (blue circle, left axis).



Correlation Value: -0.252

And here is a chart for the written assessment average marks.



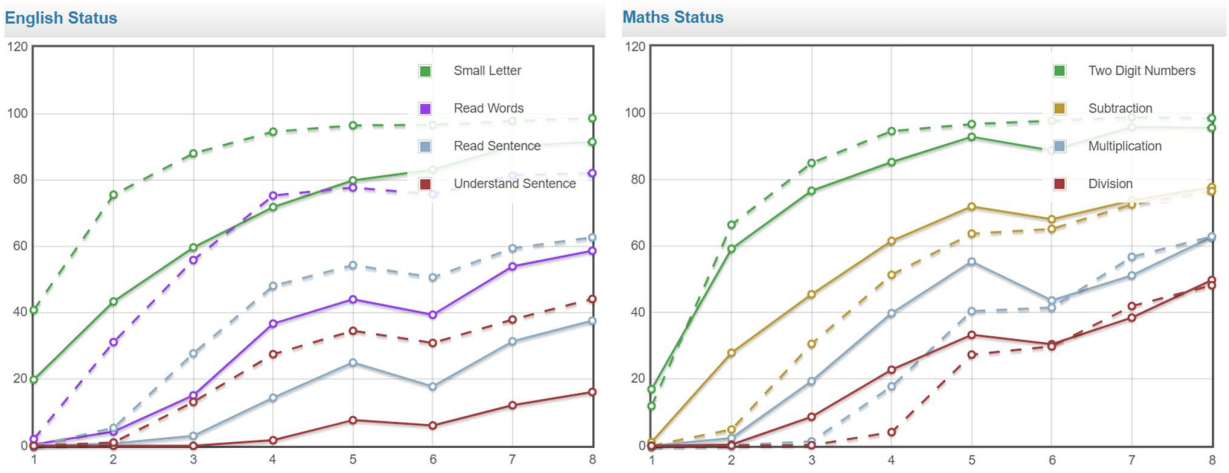
Correlation Value: -0.259

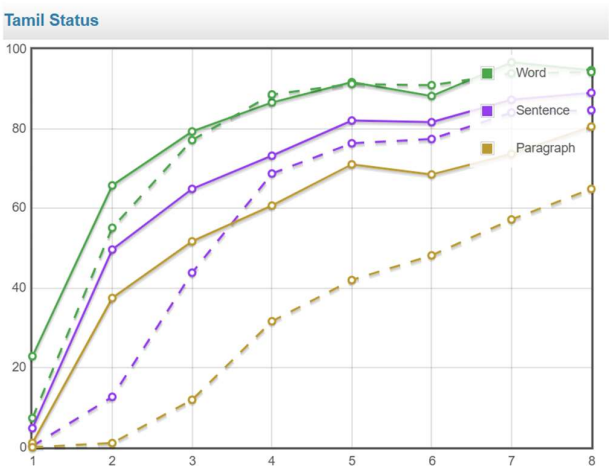
Note that as we are working with rural schools, the strength of schools tends to be small and the government has a policy of having at least 2 teachers in a school. That is the reason for majority of the schools having less than 20 students per teacher. The govts in both TN and UP aim for one teacher per 30 students which is also why very few schools have more than 30 students per teacher.

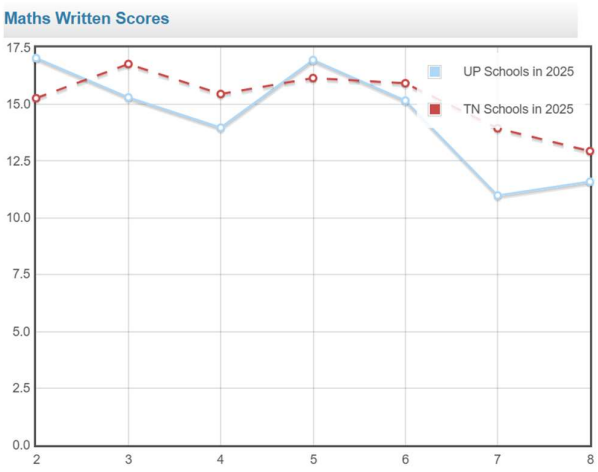
3.3 Education System (TN vs UP)

As we are working with schools in both TN and UP, we have had the opportunity to compare the performance of the children in both.

Here is the performance of the children in oral assessments in TN and UP in English, Maths and Hindi/Tamil. Note that the thick lines represent UP and the dotted lines represent Tamilnadu.







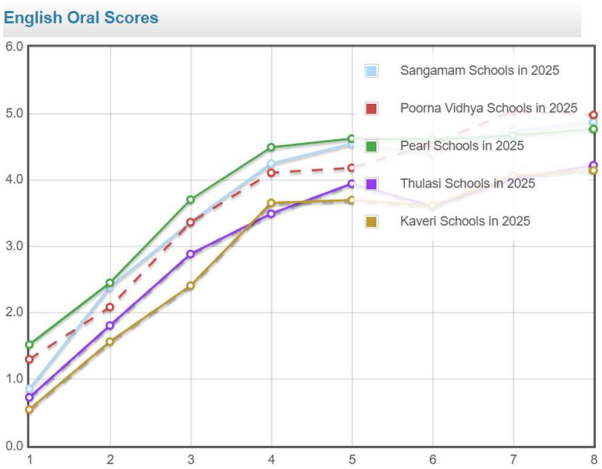
Students in UP fare much worse in English but fare much better in their mother tongue than their counterparts in TN. None of the government schools are English medium schools in UP whereas 40% of the students in the government schools are in English medium in TN. In Maths the results are somewhat mixed. In the oral assessments, UP students are better in their primary classes but TN students catch up after 6th std. In the written assessments, in primary classes, the results are mixed but children in middle schools are better in TN.

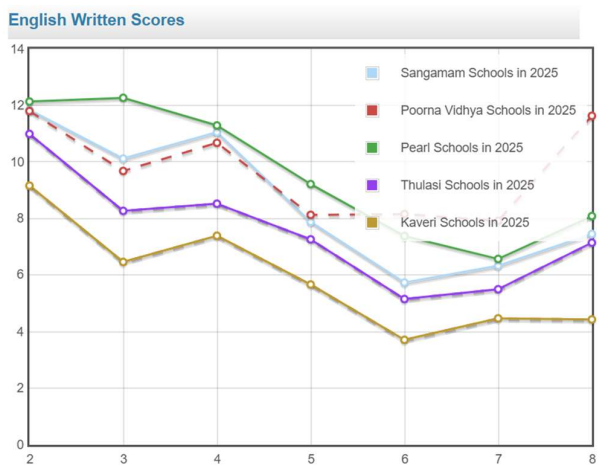
3.3 Geography within an Education System

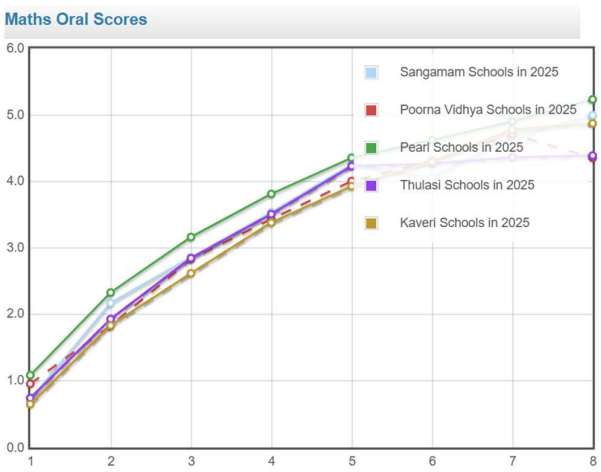
In Tamilnadu, Asha works in 5 areas.

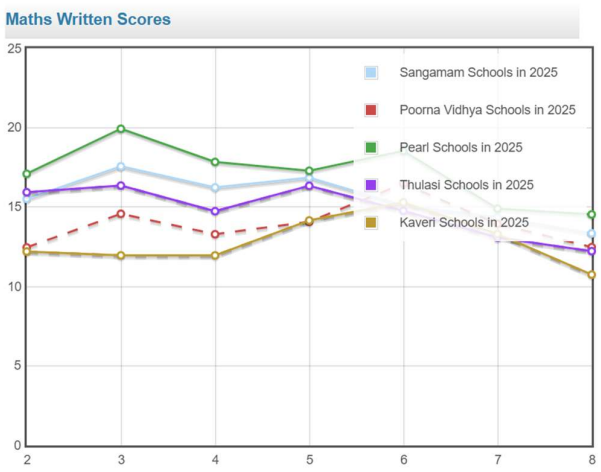
- Sangamam – Thiruvallur Dist.
- Pearl – Thoothukudi and Thirunelveli Dists.
- Thulasi – Villupuram and Thiruvannamalai Dists.
- Poorna Vidhya and Manigal – Chennai and vicinity in Chengalpet Dist.
- Cauvery – Thiruvarur Dist.

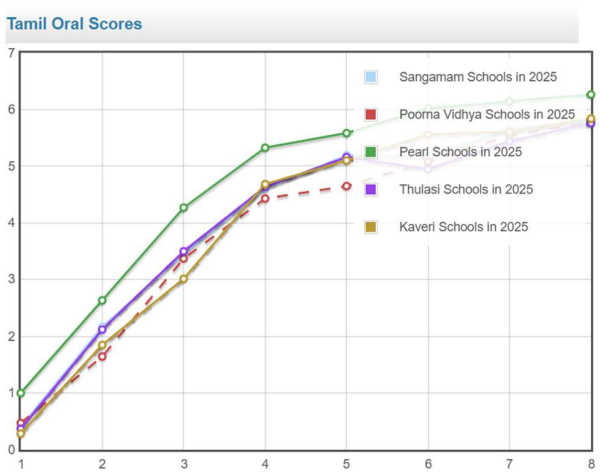
Here are charts that compares the performance of these 5 projects in our various assessments in 2024-25.

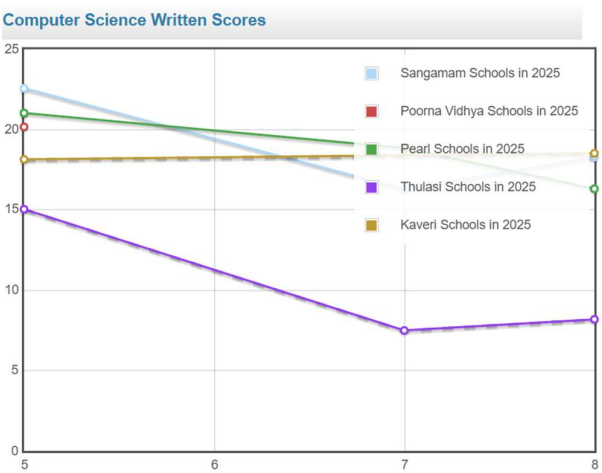












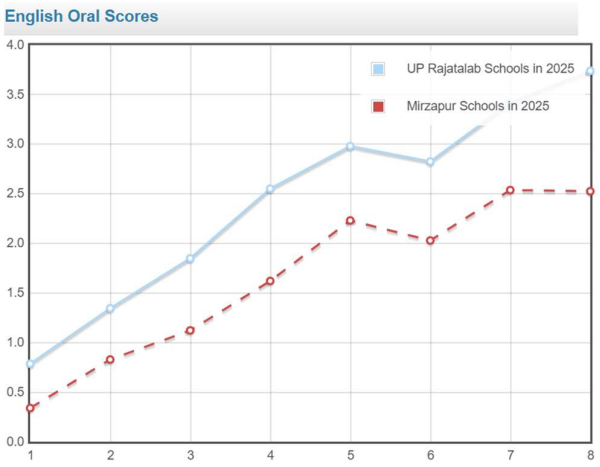
In all the oral assessments the different geographical areas are tightly banded together. There is greater variance in the written assessment scores. The students in Thoothukudi and Thirunelveli seem to consistently do better whereas the students in Villupuram, Thiruvannamalai and Thiruvarur do a little worse with Thiruvallur faring somewhere in between. Students in Chennai and vicinity perform well in English especially from 6th to 8th stds but do poorly in Maths and Tamil.

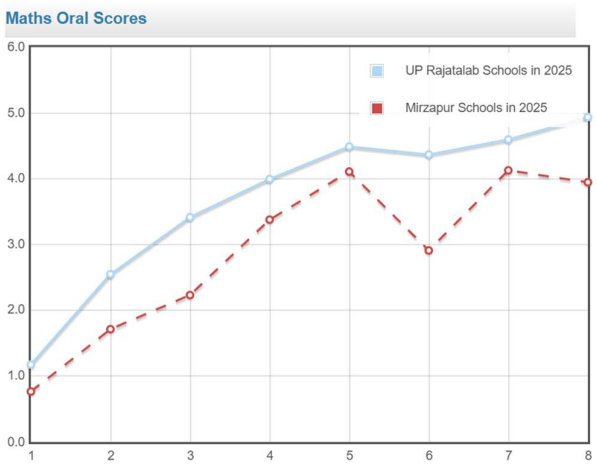
There is much greater variance in CS assessment scores. Children in Thiruvallur tend to perform the best as the CS education started in Thiruvallur for Asha and our program is the most entrenched there. Other areas are still catching up.

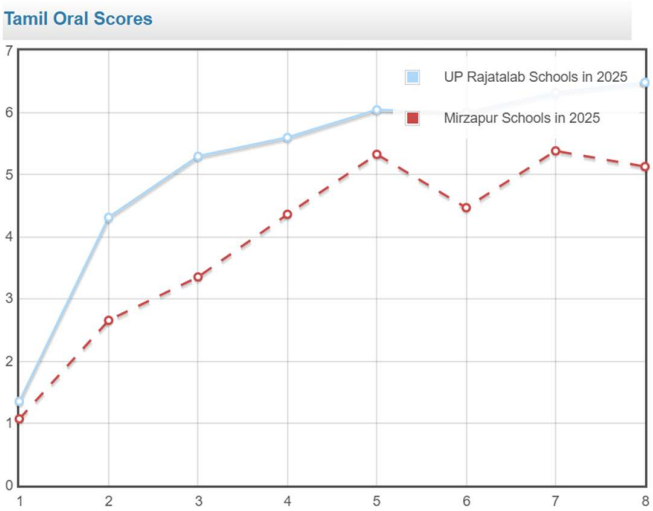
In UP we are working in 2 areas.

- Rajatalab area of Araji Lines Dist.
- Imilia area of Mirzapur Dist.

Here are the graphs that compare these two districts.



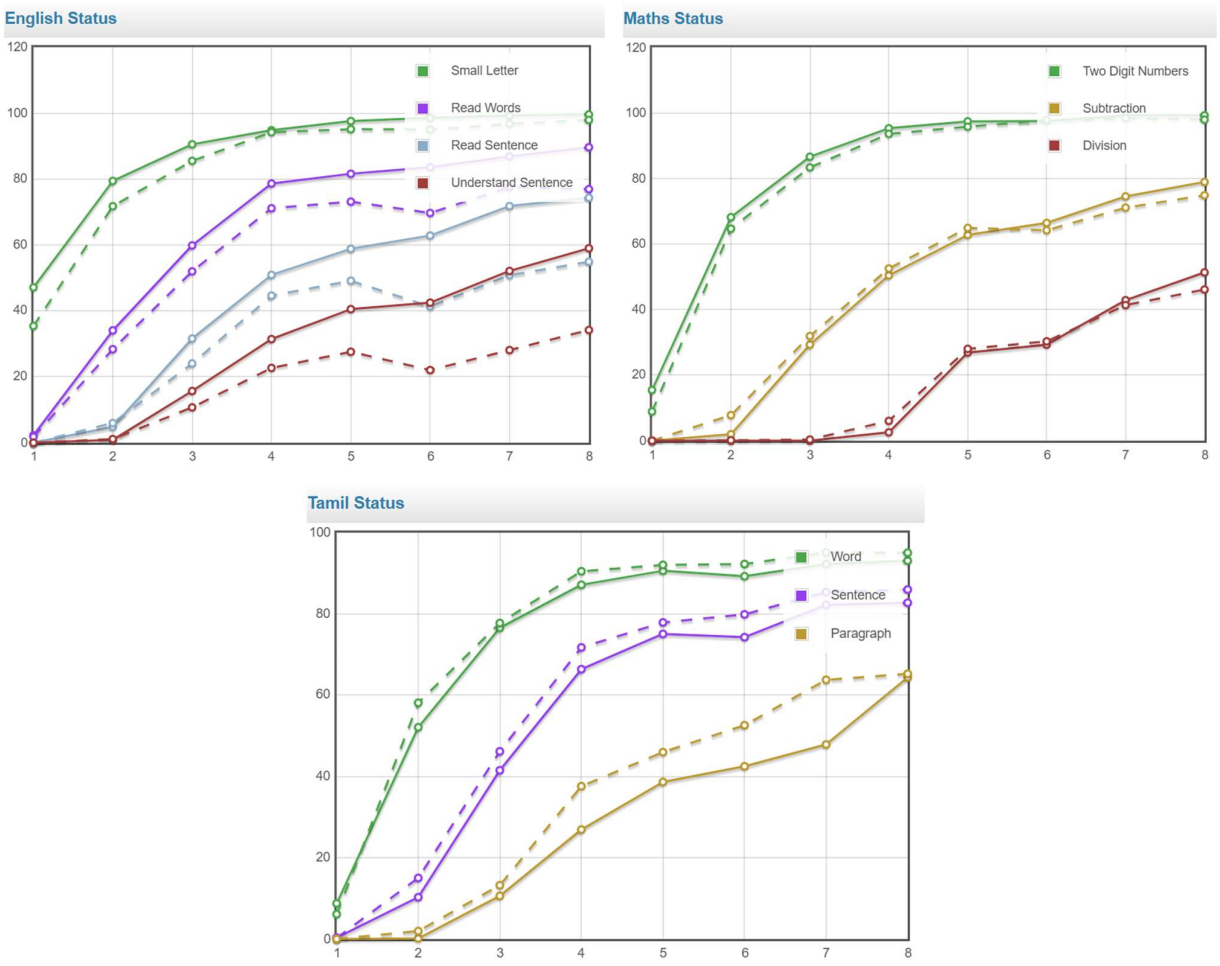




The difference between these two Geographies are much more pronounced than the difference between the different Geographies in Tamilnadu. Rajatalab in UP is a little exceptional as it is part of the Prime Minister Narendra Modi's constituency. In our visits we were also surprised to find that the schools had better infrastructure, more teachers etc. than the schools in TN. Mirzapur a poorer district may be more typical of UP as a whole.

3.4 Medium of Instruction

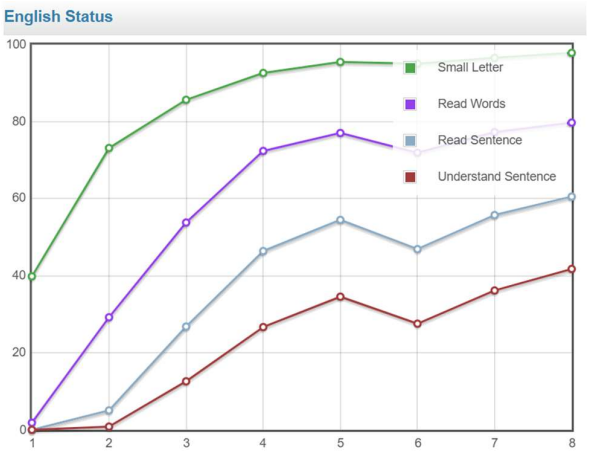
As mentioned, there are several English medium schools/students in Tamilnadu. Here is a comparison of how the children studying in English (thick lines) and Tamil (dotted lines) medium perform in our assessments.

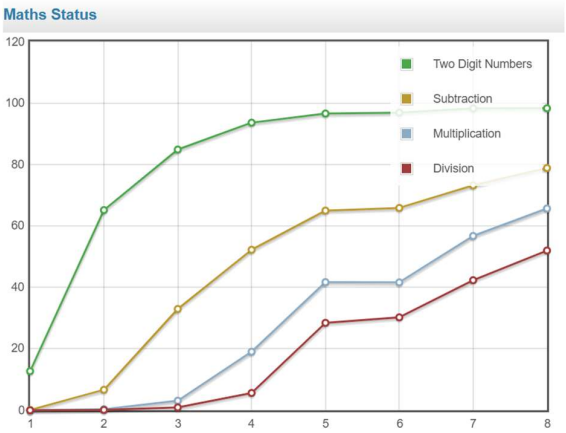


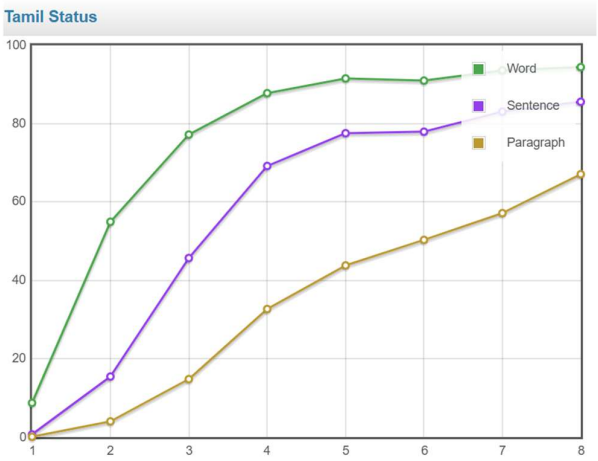
As one would expect, English medium students perform better in English and Tamil medium students perform better in Tamil. As the schools that convert to English are those in a little more aspirational / well-off areas, I expected English medium students to do better in Maths as well. That was not really the case. If anything, Tamil medium students perform very slightly better in Maths as well. Pedagogically this makes sense. It is best to learn other subjects in a language that the student is comfortable in.

3.5 Middle School Bump

As we conducted the assessments, one of the things that we have started noticing fairly consistently is how children's performance drops when they transition from primary school to middle school. Here is a graph that shows the oral assessment performance in English, Maths and Tamil across all our schools in 2024-25.



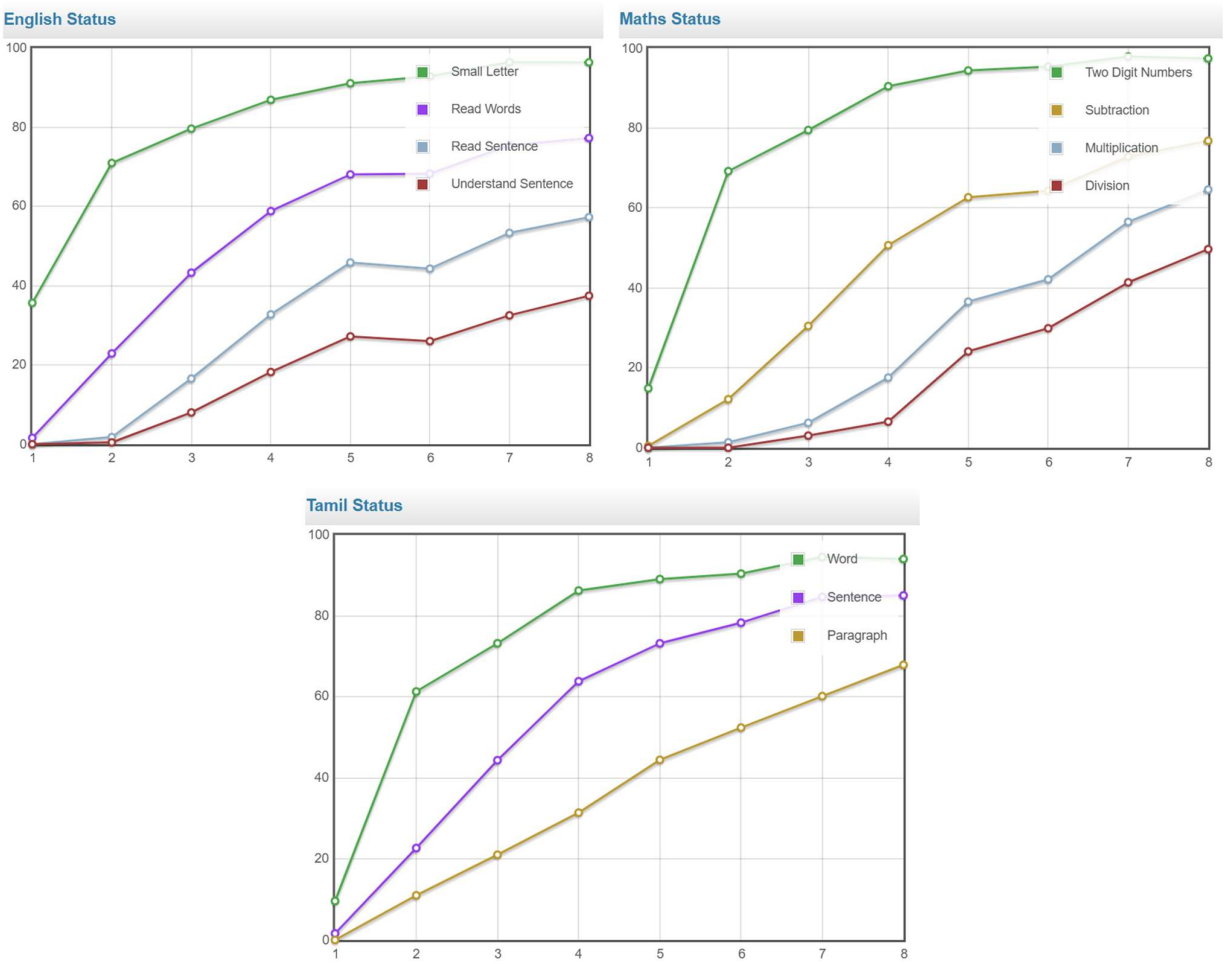




Look at how the number of children who demonstrate various capabilities takes a dip going from 5th std to 6th std! For eg. 34.6% of the children in 5th std can understand English sentences. Only 27.6% of the children 6th std are able to do the same task! In English the dip is most pronounced and the least so in Tamil. But even in Tamil the children who can read a sentence flattens out. In 5th std 77.6% of the students can read the given Tamil sentences. This remains more or less constant at 78% in 6th std before continuing the increase again 85.6% in 7th std.

As we had started conducting these assessments for classes 6 to 8, only two years back, we thought this was an anomaly caused by Covid. But since then, we have learnt that this is a common phenomenon where children experience anxiety when they move from a smaller school to a new unfamiliar bigger school with much older children.

We checked our data to see if children who are continuing at the same school from 5th to 6th do not face similar drop in their performance. Here are the oral assessment performances of children in middle schools. But note that these will not just be continuing students. There will also be students from other feeder primary schools to coming to a middle school in 6th std.



While the middle school bump is much less pronounced, when school transitions are not there, there is still a noticeable plateauing of the performance in English and Maths from 5th to 6th std. This does require further studies.

4. Analysis of Asha Programs

Here is a detailed analysis of couple of our own programs and our effectiveness.

4.1Karadi Path Program

Asha is implementing the KaradiPath program in about 75 schools. It started with 10 schools in 2022-23 which has been increasing over the years. In the year 2024-25, we had 4th std students who were in Level 3 of the KaradiPath program in the first 10 schools. We still had 100 or so schools just in Tamilnadu who had not taken KaradiPath at all.

Here is the correlation for the class 5 Maths and English performance and the KaradiPath bucket they were in,

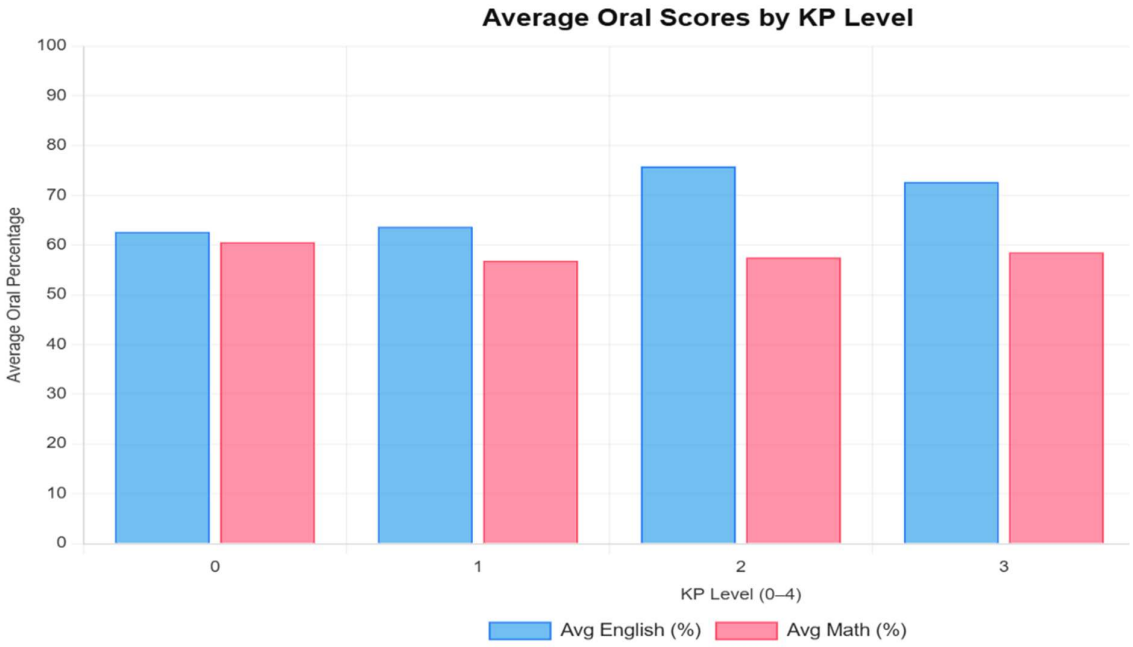
0 – No KaradiPath.

1 – Doing Level 1 KP now. Would have got about 0.3 yrs of KaradiPath instruction at the time of the oral assessments.

2 – Completed level 1 and doing level 2 KP now. Would have got about 1.3 yrs of KaradiPath instruction at the time of the oral assessments.

3 – Completed level 2 and doing level 3 KP now. Would have got about 2.3 yrs of KaradiPath instruction at the time of the oral assessments.

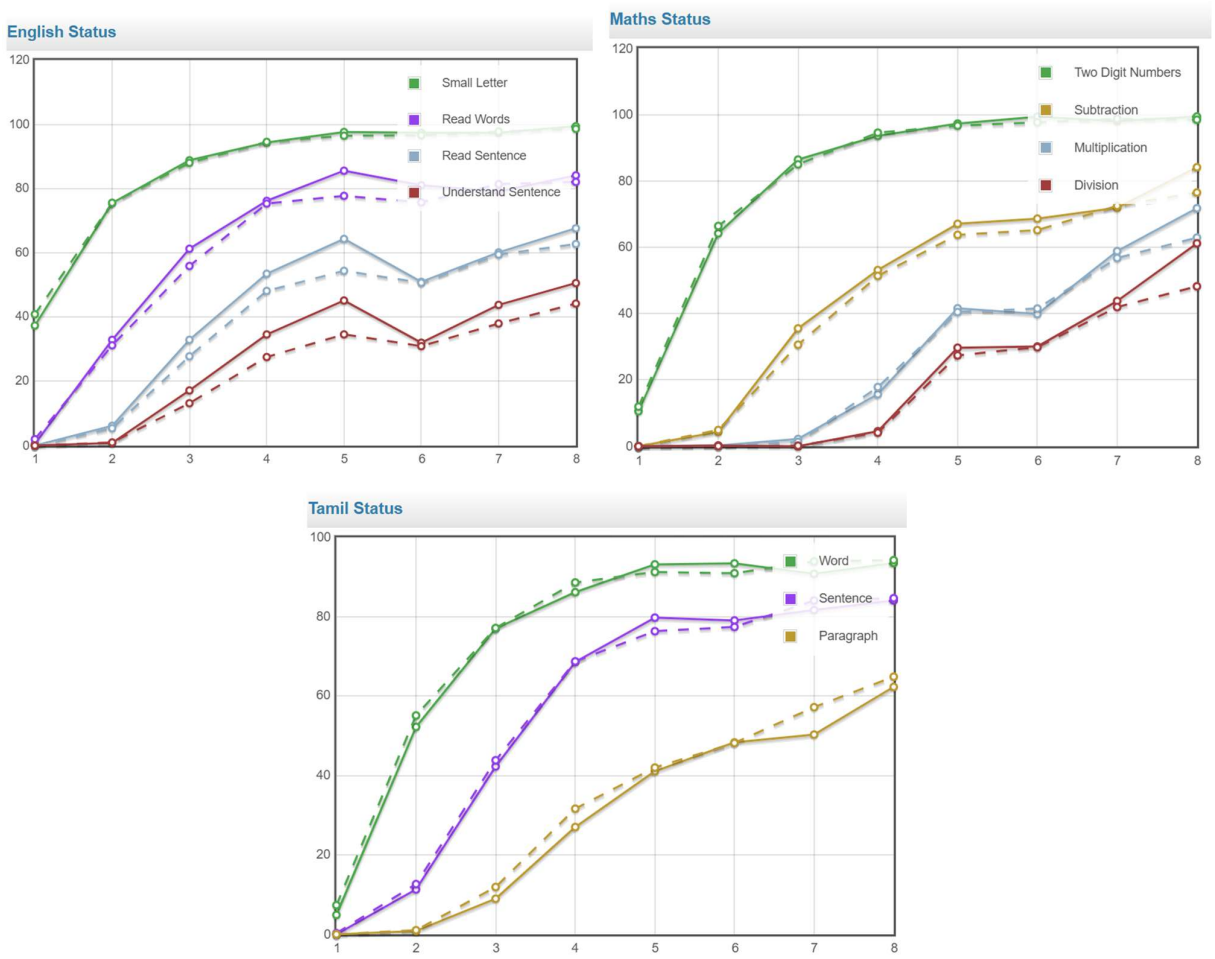
In 2024-25 we did not have any students in class 5 who had completed all 3 levels of KP. This was done only for the schools in TN as we haven't started KP in UP.



English Correlation: 0.101 Maths Correlation: -0.036

There is a small positive correlation between KP level and English performance. There is a even much smaller negative correlation with Maths performance. At KP level 2, we see a jump in performance. These are students who have completed about 1.3 years of KaradiPath at the time of the assessment. The negative correlation in Maths is possibly due to not selecting very small schools which would have done better in both Maths and English than bigger schools. This may also be because of diversion of 3 hours of learning to spoken English every week.

Here is a straight comparison of the oral assmt performance between KP level 2 and 3 schools and No KP schools. The unbroken lines represent schools that are currently doing KaradiPath level 2 or level3. i.e. They have completed at least one year of the KaradiPath program. The dashed lines represent schools where we haven't started the KaradiPath program.

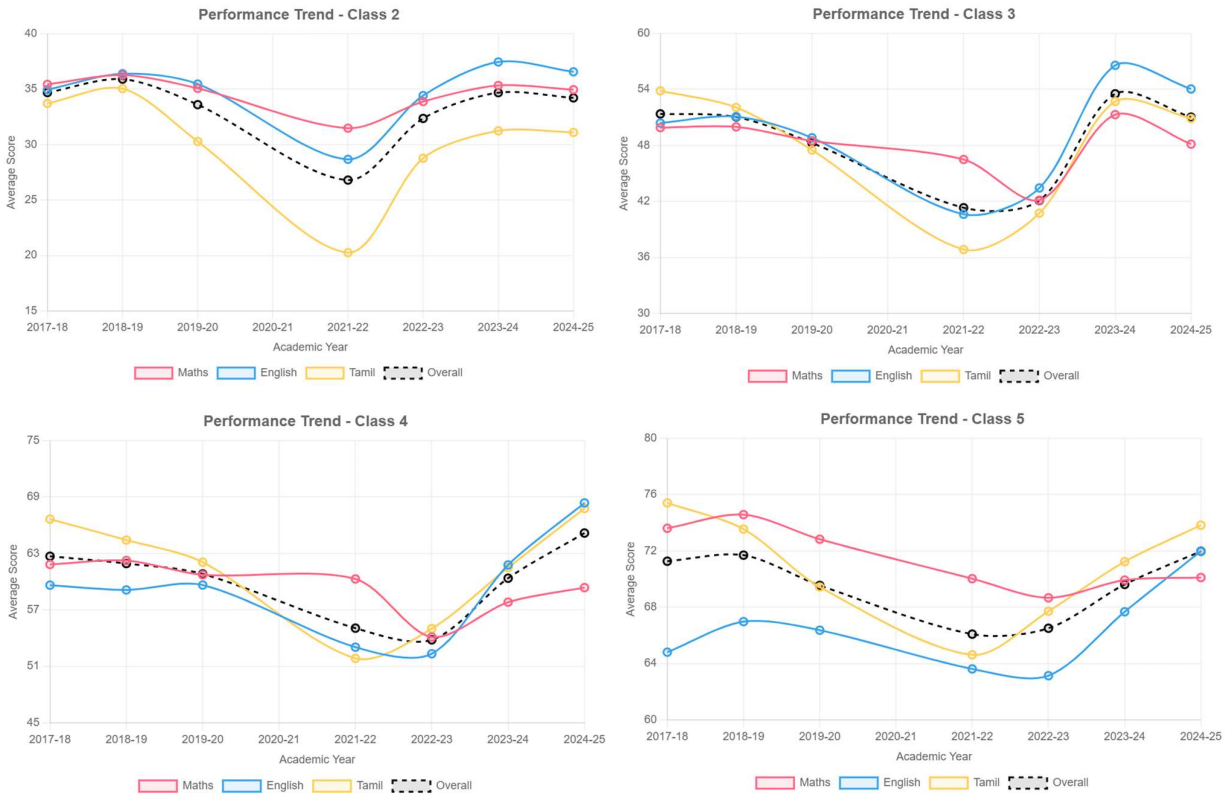


The schools that have taken KaradiPath and are at least in the second year of their program are doing substantially better in English and are in similar state in Maths and Tamil. If you look at it in a little more detail, the improvement in performance is much more significant in classes 4 and 5. Note that the outperformance if any in classes 6 to 8 have nothing much to do with KaradiPath program.

This analysis shows that the KaradiPath program is improving the English level of the children even when measured orthogonally with our Oral assessment which predates our KaradiPath program and have little in common with the methodology. With assessments which are more aligned to what is being taught in the KaradiPath program we have been seeing much more significant gains among the children.

Post-Covid Recovery

See the analysis from 2022 of the loss of education due to Covid. How have the learning levels of children recovered in the 3 years since Covid? Here are graphs of the children's performance in oral assessments in various classes from 2017-18 to 2024-25.

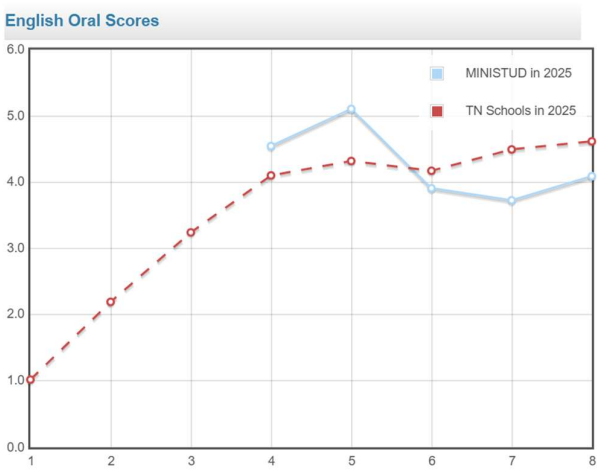


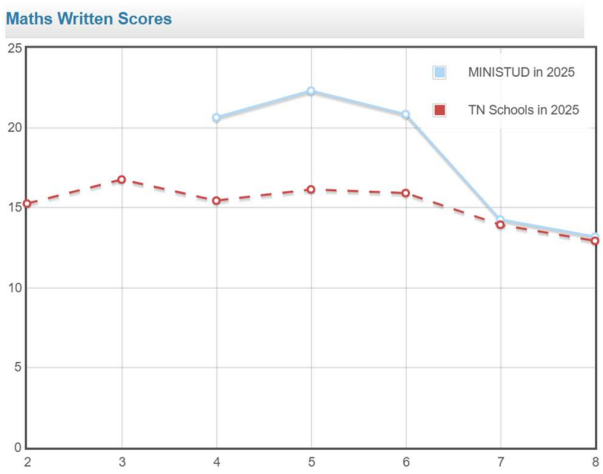
Please note the following,

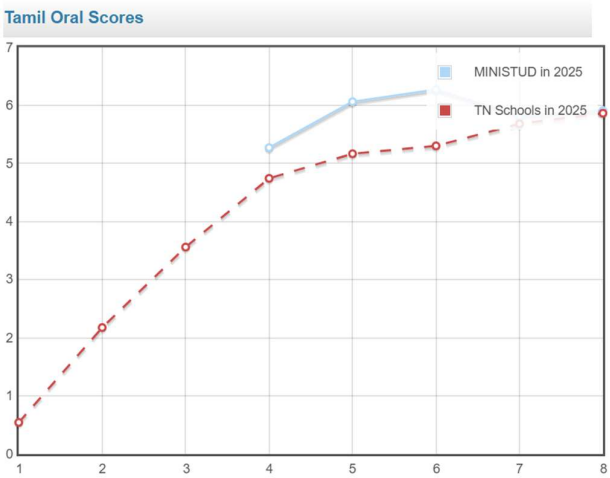
1. The oral assessments for the year 2021-22 was conducted in April 2022 whereas it is usually conducted in Oct of that academic year itself. For eg. the oral assessment for 2024-25 was conducted in Oct 2024. This is the reason for the drop not being even higher in 2021-22 and most performances hitting the bottom only in 2022-23.
2. The set of schools at which the oral assessments were conducted is not the same every year. These have been expanding for most part. We did this analysis only for the TN schools. We started conducting the assessments in UP only after Covid. Therefore it would have unnecessarily skewed the results.
3. The reason we haven't extended this analysis to higher classes is also because we started conducting these for classes 6 to 8 only after Covid.

It is heartening to note that across most class-skill combinations, the performance has recovered back to the pre-covid levels. While language skills seem to have recovered, Maths is still to come back to the pre-covid levels especially for classes 4 and above. From our observations, the hit would have been even higher for classes 6 to 8.

For children who were in mini-schools, do things look different? The number of children still in the schools who went to our mini-schools in 2020-21 is 129. They are all in classes 4 and above. Here is a comparison of their performance against all the students in TN in the various assessments.







As the sample size is small, we cannot read too much into this data. The sample size is reasonable (close to 50) for classes 4 and 5. They are about 10 each for classes 6 to 8. English written is similar to English Oral and Maths written is similar to Maths oral. Our mini-school children on the whole are doing better than the students in all schools in TN. Classes 6 to 8 in English and classes 7 and 8 in Maths may be an aberration due to the small sample size.

5. In Conclusion

Detailed analysis of these results and what this says about educational performance is given in my other post on Factors that affect Education. This article is being updated based on the information from this report. I will reiterate just the main conclusions from that report here,

1. There is indeed a very quantifiable education performance at a student level and at a school level which remains consistent across subject, assessment methodology and time. Therefore, understanding the causes of that performance is important.
2. Sociological factors like parental education, the kind of preschool education a student received, regularity with homework, whether they are from BPL families etc. have a high correlation with the performance of the students.
3. These sociological factors work to reinforce each other and thus become even more important.

4. School strength and teacher-student ratio are also important factors. But the sociological factors are even more important than the number of teachers teaching at the school.

Unrelated to the above, we were also able to observe the following things from our data.

1. Gender makes a huge difference in the performance of the students. Girls outshine boys in our oral and written assessments in Maths, English and Tamil. However in a practical exam like our computer science boys do well. This also points to somethings that need to improved in terms of teaching and assessing in a practical manner.
2. There is a middle school bump in performance. Some changes to the way the schools are structured and the curriculum may improve this.
3. TN schools do better than UP schools in English but do worse in mother tongue.
4. In languages the education seems to have recovered to pre-covid levels however it is still lagging in Maths.

Finally, we evaluated a couple of our programs to come to the following conclusions.

1. Our computer science education and assessments while still constrained by the sociological factors seems to reach out better to children who adapt to our practical methodology (esp. boys).
2. Our KaradiPath program is indeed improving the English performance of the students even when measured orthogonally using our oral and written assessments.
3. Our mini-schools contributed in arresting the slide in education for the students who attended it. The effect can still be seen to some extent.

And most importantly the report's purpose is also to make people aware of the data and tools we have developed in Asha Chennai over the last 10 years to systematically study the challenges confronting our education system. We hope these tools get adopted for wider deployment and deeper study of the underlying causes for educational performance.

6. Further Study Required

Here are somethings that merit further study.

1. Parents employment.
2. Significant change in a school. HM change, teacher change.
3. Some measure of infrastructure at the school and how it related to educational performance.
4. How does learning computer science impact performance in English, Maths etc.?
5. More accurate data about homework assignment by schools and whether children do that.
6. Collect the BPL data directly from the Panchayat. This will underestimate the percent of BPL families in the school as the better of students are the ones who are more likely to go to private schools. But this will still be better than the UDISE data.
7. Collect the number of students in the school's geography who go to private school and other schools.
8. Churn in the school students.
9. Rural vs Urban vs Peri-urban.
10. For Asha's own programs, we are tracking usage data of the contents in our Asha Kanini. We can correlate the usage with the performance in our tests.

We hope to continue enhancing the assessments over the next years.