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Analysis of Factors Affecting Education in the Government Schools of India

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ABSTRACT: The quality of education in government schools in India has been of great concern over the last few years. The ASER (Annual State of Education Report) report by the Pratham foundation and NAS (National Achievement Survey) report by MHRD, Government of India, shows the consistent subpar performance of students studying in these schools. This paper provides an in-depth analysis of factors affecting the delivery of quality education in the government schools of India. Major findings include: the strong negative correlation of - 0.824 between teacher attendance and the numbers of teachers in a school, in 67% cases of the irregularity in mid-day meal serving is due to lack of grains, negative correlation of - 0.42 between student attendance and Pupil Teacher Ratio of the school.

KEYWORDS: Government schools analysis, Education Data Mining, government school student, government school teacher

I. INTRODUCTION

There are fourteen lakhs sixty seven thousand six hundred and eighty (1467680) government schools in India (according to UDISE 2016-17) providing education to around one hundred and thirteen (113) million students studying in these schools. The majority of students studying in government schools are from unprivileged backgrounds and low income families. Hence, improving the quality of education is a crucial and urgent need of India to empower the population lying at the bottom of the pyramid. While India is close to 100% enrolment rate, the learning outcomes of the students are not at par with their grades. The Annual Status of Education Report (ASER) for 2012 found that less than half of grade 5 students were able to read a grade 2-level text and less than a quarter of them could do simple division problems (Banerji et al., 2013)[1]. There are various factors that culminate and affect the outcome of students. The research by (Kingdon, G., & Banerji, R. (2009)) [2] has found the need to improve student attendance, teacher attendance, and teacher knowledge to improve the learning outcomes of students. It also reports that regularity attendance of students is an essential condition for effective teaching and learning. Hence it is evident that not only teaching but various other factors are also important for students learning.

In this paper, we have found trends and correlations between various factors like attendance of teachers, attendance of students, enrolment of students, availability of basic facilities in the schools and mid-day meal execution. It is important to understand the relations and correlations among the factors to take appropriate steps to improve the learning of students and knowledge delivery by the teachers.

II. DATA

We collected data on relevant factors that affect students learning from three thousand four hundred and sixty five (3465) government schools, seven thousand two hundred and thirty (7230) teachers and one lakh (100000) students. The data was collected from the government schools of the Giridih district of the state of Jharkhand between July 2016 and August 2018. Giridih district consists of thirteen (13) blocks with 12 rural and 1 urban block. The blocks are namely Bagodar, Bengabad, Pirtand, Gandey, Dhanwar, Tisri, Deori, Jamua, Gawan, Suriya, Birni, Giridih, and Dumri. A quality improvement program named Disha was launched by district administration of Giridih, in partnership with

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Promorph Solutions Pvt Ltd, a social impact company incubated at IIT Kanpur for improvement of quality in the schools. Promorph Solutions Pvt. Ltd. developed and implemented an Education Intelligence System named EmpowerU to leverage technology for collecting, analysing and studying the data from the schools and bring systemic reforms for improving the quality of education. Data related to attendance of teachers, attendance of students, mid-day meal serving, grievances of school and teachers were collected every day from the schools. Periodic data on infrastructure, facilities and some other parameters were also collected through school inspections. Systemic reforms were brought using EmpowerU by automatically processing the data received from the schools every day for generating insights and enable decision making for the administrators. Our work is based on data from Giridih district and it may vary for other districts.

III. ANALYSIS

Analysis of data provides insights about the factor affecting quality of education and enables data-driven decisions. The analysis is divided into three sections: a) Analysis and study of data about teachers b) Analysis and study of data about students c) Analysis and study about the government schools.

a) Analysis and study of data about government school teachers

In this section, we present various teacher related parameters and identify patterns inferred through analysis.

i) Average Teacher's Attendance varies with Area Type

We analysed whether teacher attendance varies with location i.e. rural or urban location. With 12 rural blocks and 1 urban block in the district, we identified that the average teacher attendance varied with the location of the school. Generally, we tend to think that schools of rural blocks are difficult for teachers to reach, which can lead to lower attendance, but data spoke differently. Opposite to expectation, the analysis showed that the average attendance of teachers in the rural blocks was 5% more than the average attendance in the urban blocks.

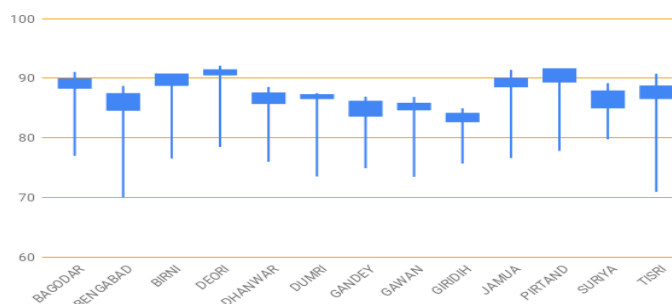


Figure 1: Average attendance of teachers in 13 blocks

ii) Teacher's Attendance varies with School Level

The overall average attendance of teachers in the district was found to be 86.3%. On analysing at different school levels we found average attendance of teachers in primary schools at 89.91%, upper primary schools at 85.4%, whereas the attendance at secondary and higher secondary level (see Table 1) was found below the overall average attendance of the district. The low attendance of teachers in higher

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classes as shown in Table 1 may adversely affect the performance of the students in board and other exams. The data indicates lack of accountability in teachers of higher grade level schools.

School Category	Average Teacher Attendance
Primary Only (class 1-5)	89.91
Primary With Upper Primary (Class 1-8)	85.4
Primary With Upper Primary And Secondary(Class 6-8)	83.97
Secondary Only(Class 9-10)	81.327
Secondary With Higher Secondary (Class 9-12)	82.15
Upper Primary With Secondary And Higher Secondary (Class 6-12)	78.03

Table 1: Average teacher attendance in different school levels in Giridih

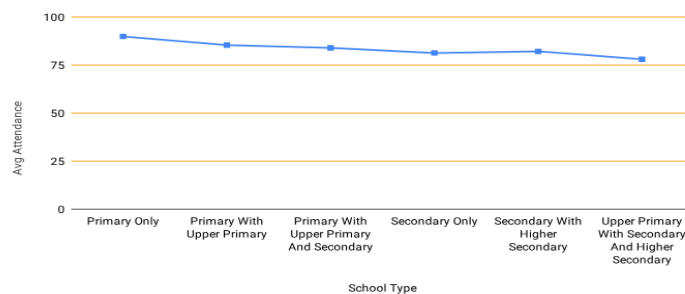


Figure2: Attendance of teachers according to school level

iii) Teacher Attendance varies with Teacher Qualification

We found the relation of teacher attendance with their qualification. Teachers in the district possessed different level of educational degrees from diploma to postgraduate degrees. The average attendance of teachers was found unaffected by their qualifications.

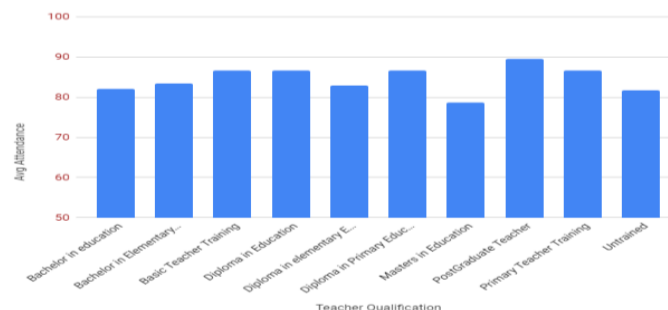


Figure 3: Average teacher Attendance and Teacher Qualification

iv) Correlation between the number of teachers in a School and Average Teacher Attendance

We also tested if average teacher attendance varies with the number of teachers in that particular school. The teacher attendance in Giridih showed a similar trend with the strong negative correlation of -0.824

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with the number of teachers in a school. Schools with more number of teachers had lesser average teacher attendance. It was also a key finding proposed by the paper (K Muralidharan, Jishnu Das) [3] which observed a strong negative correlation between the two factors.

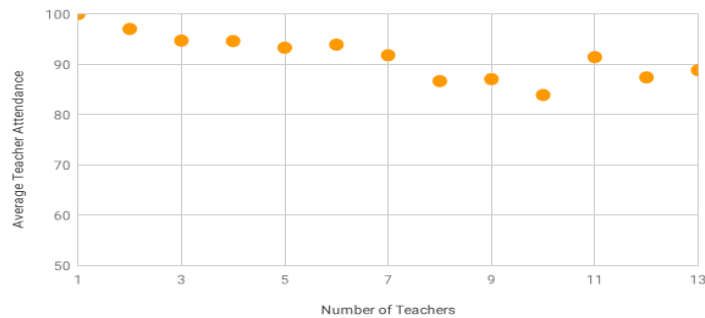


Figure 4: Average Teacher attendance versus the number of teachers

b) Analysis and study of data about the government school students

Our research on government schools students provided us with various insights that could be very useful in increasing attendance and enrolment of students in the schools. It is very important to take measures to improve the attendance as the research [Kingdon, G., & Banerji, R. \(2009\) \[2\]](#) suggest that regular and stable attendance of students are an essential factor for effective teaching and learning. We have analysed various factors that may affect student attendance, enrolment and drop-out and altogether their learning outcome.

i) Student attendance varies with type of area

We found that the average attendance of students in urban blocks is 60.82% and in rural blocks is 62.82%. Hence, it indicates that average attendance of students does not vary much with area type

ii) Student attendance and Pupil-Teacher Ratio(PTR)

We calculated the PTR of all classes for every school and found that student attendance is negatively correlated with a value of -0.42 with average student attendance.

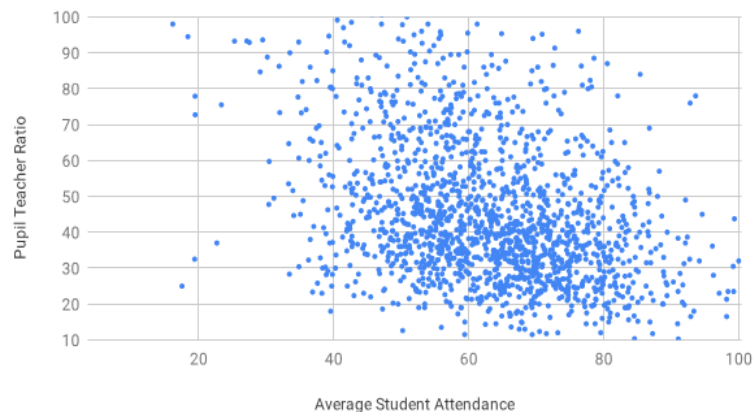


Figure 5: Pupil-Teacher Ratio and Average Student Attendance in Giridih

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iii) Student Attendance and class level

It is observed that students from low-income background studying in government schools drop-out before completing their school education. We analysed attendance of students in different class levels. We observed that student attendance decreased with higher class levels. We found that the average attendance of students from class one (1) to five (5) was 63.884% whereas from class six(6) to class eight (8) the average attendance was found to be 55.49%. The average attendance from class nine(9) to class ten(10) stood at 39.78% and from class eleven(11) to class twelve(12) the average attendance was 30.55% which is the lowest.

Class level	Average student attendance
Class 1 - 5	63.884%
Class 6-8	55.49%
Class 9-10	39.785%
Class 11-12	30.55%

Table 2: Class level and average student attendance



Figure 6: Average student attendance with class level

A similar observation was observed in terms of school level. Average attendance in primary school was found to be 69.53% whereas it was just 22.88% in the secondary and higher secondary schools.

School level	Average student attendance
Primary Only	69.53
Primary With Upper Primary	61.22
Primary With Upper Primary And Secondary	50.33
Secondary Only	37.008
Secondary With Higher Secondary	22.88
Upper Primary With Secondary And Higher Secondary	65.82

Table 3: School level and average student attendance

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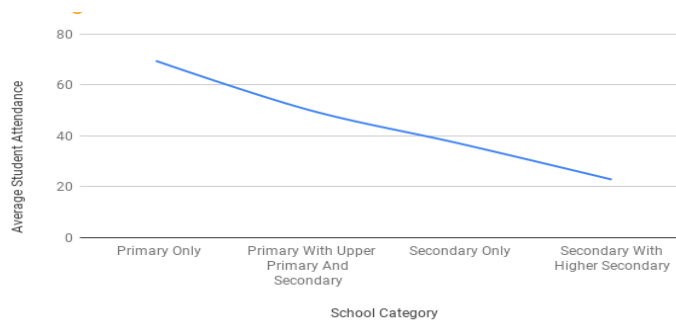


Figure 6 :Student Attendance with school Level

iv) Student enrolment and school facilities

To identify the impact of facilities on student enrolment we analysed student enrolment with facilities in the schools. Huge investments by the government of India have been made to improve input-based measures such as infrastructure, toilet and drinking water facilities. We found a positive correlation of 0.3 between student enrolment and facilities in the school. Schools in Giridih with more facilities have more number of students. The facilities considered for analysis are availability of drinking water, functional toilets and library facility in the school premises.

c) Analysis and study of data about the government school

In this section, we have analysed school related services like mid-day meal. Mid-day scheme was started by the government of India in 1995 to increase enrolment in the schools. The research (Molla, Sheikh)[4] have observed an increase in student attendance in primary levels because of mid-day meal serving.

i) Mid-day meal and grain availability

We analysed how mid-day meal is affected by grain availability. We found that lack of grain was the most Common issue that caused irregularity in mid-day meal serving. 67.2% of the mid-day meal grievance accounted for grain-related issues (Figure 7). We also found that mid-day meal serving was discontinued for weeks and even months due to lack of grain.

ii) Mid-day meal and fund availability

We also analysed whether mid-day meal serving is affected by fund availability. We found that 17.2% of the mid-day meal grievances accounted for fund issues (Figure 7).

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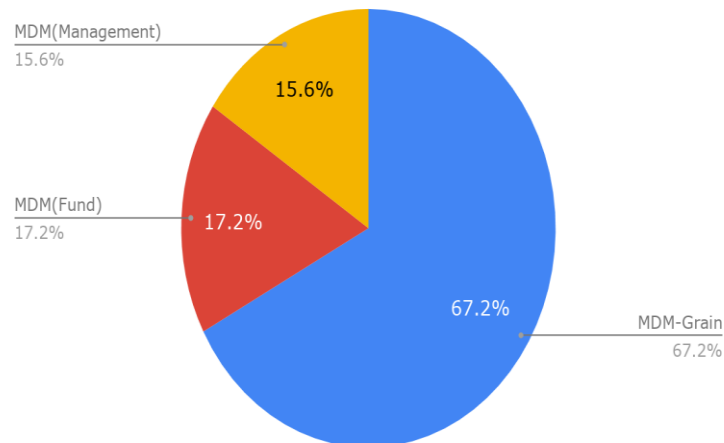


Figure 7: Mid-Day Meal analysis

IV. ANALYTICAL RESULTS

In the above section, we identified various trends and correlations about government school teachers, government school students and the government schools. All findings are summarised in the given table:

S NO	Analysis	Observation
1	Average teacher attendance and area type	Attendance of rural blocks 5% more than the urban blocks
2	Average teacher attendance and school level	Attendance of primary level teachers more than higher secondary level teachers.
3	Teacher attendance and qualification of teachers	Average teacher attendance is unaffected by teacher qualification
4	Correlation between the number of teachers per school and average teacher attendance	Strong negative correlation of -0.824
5	Student attendance and type of area	Not much difference in average attendance in rural blocks with 62.82% and urban block with 60.82%
6	Student attendance and Pupil Teacher Ratio(PTR)	Negative correlation of -0.42
7	Student attendance and class level	Student attendance decreases in higher classes.
8	Student enrolment and school facilities	Positive correlation of 0.3

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9	Mid-day meal and grain availability	Lack of grain is the reason for 67.2% irregularity in mid-day meal serving
10	Mid-day meal and fund availability	Lack of funds is the reason for 17.2% irregularity in mid-day meal serving.

Table 4: Findings of the research for Giridih district

V. CONCLUSION

This paper throws light on various trends and patterns affecting quality of education in the government schools. We observed that the average attendance of teachers in rural areas was 5% more than the average attendance of teacher in urban areas, attendance of primary school teachers was more that attendance of higher school teachers, attendance of teachers remain unaffected by their qualification, a negative correlation of -0.824 between the number of teachers per school and average teacher attendance. The study on government school student analysis reflected that the average attendance of students in rural and urban blocks does not vary much, there is a negative correlation of -0.42 between student attendance and Pupil Teacher Ratio (PTR) in the school, there is a positive correlation of 0.3 between student enrolment and facilities in the schools. We also found that execution of mid-day meal get affected majorly due to unavailability of grains as 67.2% of the irregularity in mid-day meal delivery was caused due to grain unavailability. The above analysis shows that there are various factors on which we can work to overall improve the student learning outcome. Factors such as teacher attendance, school facilities, mid-day meal serving can be improved to improve the student enrolment, student attendance and student outcome. Whereas, parameters like Pupil-teacher ratio (PTR) can be normalised as per directives of Ministry of Human Resource Development (MHRD), Government of India to increase student attendance.

VI. FUTURE WORK

As part of this research we have covered various factors which affect the quality of education in government schools. In the next paper we will get into more comprehensive analysis using student marks and identify the most significant factors affecting their achievement.

REFERENCES

- [1] Banerji, R., Bhattacharjea, S., & Wadhwa, W. (2013). The Annual Status of Education Report (ASER). Research in Comparative and International Education, 8(3), 387–396. <https://doi.org/10.2304/rcie.2013.8.3.387>
- [2] Kingdon, G., & Banerji, R. (2009). Addressing school quality: some policy pointers from rural north India. (RECOUP Policy Brief, 5). Cambridge: University of Cambridge, Faculty of Education, Research Consortium on Educational Outcomes and Poverty (RECOUP).
- [3] Muralidharan, Karthik & Das, Jishnu & Holla, Alaka & Mohpal, Aakash, 2017. The fiscal cost of weak governance: Evidence from teacher absence in India," Journal of Public Economics, Elsevier, vol. 145(C), pages 116-135. <<https://ideas.repec.org/a/eee/pubeco/v145y2017icp116-135.html>>
- [4] Molla, J. (2015). Impact of Mid-Day Meal Programme on Educational Level: A Case Study of Ballabhpur Village, Birbhum District, and West Bengal. International Journal of Innovative Research in Science, Engineering and Technology. 04. 2443-2450. 10.15680/IJIRSET.2015.0404046.
- [5] Bold, Tessa, Deon Filmer, Gayle Martin, Ezequiel Molina, Brian Stacy, Christophe Rockmore, Jakob Svensson, and Waly Wane. 2017. "Enrollment without Learning: Teacher Effort, Knowledge, and Skill in Primary Schools in Africa." Journal of Economic Perspectives, 31 (4): 185-204. DOI: 10.1257/jep.31.4.185
- [6] Kremer, Michael, Holla, Alaka, 2009. Improving education in the developing world: what have we learned from randomized evaluations? Annu. Rev. Econ. 1, 513–542.
- [7] Ladd, Helen, 1999. The Dallas school accountability and incentive program: an evaluation of its impacts on student outcomes. Econ. Educ. Rev. 18 (1), 1–16.
- [8] Muralidharan, Karthik, Kremer, Michael, 2008. Public and private schools in rural India. In: Peterson, Paul, Chakrabarti, Rajashri (Eds.), School Choice International. MIT Press.
- [9] Figlio, David, Loeb, Susanne, 2011. School accountability. In: Handbook of the Economics of Education, vol. 3. Chap. 8.