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Relationship between Schools Infrastructural Facilities and Education attainment in Primary Schools of Rajasthan: A case study in Districts of Jaipur and Pratapgarh

ANUSHREE JANU
Senior Research Fellow
CSRD, Jawaharlal Nehru University, New Delhi (India)

ABSTRACT

The concept of infrastructure has been seen on a comprehensive scale, not only in terms of education institution, but regarding organizations, public places all over the world. In this case, an attempt is made to acquire an understanding of infrastructural development in schools. School infrastructure facilities and friendly environment plays an active role in inciting the inherent faculties of children and make them perform better. For this study, secondary data have been procured from DISE School Report Card, to show the picture of district level performance of Primary school in Rajasthan. For analysing the situation on ground, a primary survey was conducted by the researcher in selected school in Jaipur and Pratapgarh. Composite Index, correlation and GIS mapping have been used as a tool for this study. Main findings are: Districts which have performed better in Infrastructure Domain in Primary schools of Rajasthan are Jhunjhunu, Kota and Sirohi. During field visit it was observed that sufficient Infrastructure facility is not present in Primary school of Rajasthan. Schools which have performed better are Surajpol, Jagdamba and Chomu. It was found that there is positive and significant correlation between Infrastructure facility in Primary school and Education attainment of student.

Key Words : Infrastructure Facility, education attainment, Schools, Rajasthan

INTRODUCTION

The Present study is to analyse the relationship between the condition of school's infrastructure facilities, learning environment and student's outcome. A good infrastructure facility enhances educational venture of students in schools. Examining of Aforementioned factors results in contextual understanding of role of infrastructural facilities in educational attainment. So therefore, the study is aimed at critically analysing the relationship between the two.

Now some may argue that "For those who love to read and study, any place can be good to read and learn. So, space you are in, does not matter, the knowledge is immaterial, the physical context is secondary, and that what is important is to concentrate on what you are reading".

But if we transfer this reasoning to the reality of educational system, especially in primary schools, the empiric evidence is flagrant. Learning space and having room in good conditions is decisive for students to achieve the expected academic results. Research had shown that clean and good air quality, good light, a little comfort, safe environment, building structure, quality of maintenance, colour and ambient temperature could affect students health, safety as well as a sense of self and psychology of small age group children in primary schools. The fact is that a good school infrastructure with renewed spaces makes it possible for children and youth that live in remote areas to study and, in addition, tends to improve the attendance and interest of students and teachers in learning. For this same reason, investments in school infrastructure have a essential role in solving access problems of students to the school system and to improve

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their performance. So, policy makers should be concerned about the relationship between school infrastructure facilities and student learning and achievement, not only because of health, security, and psychological issues, but also because the failure to create and maintain optimum learning environments can determine other efforts to reform education (vendiver, 2011).

The infrastructural facilities contribute to the learning environment. Throughout the country, in most schools, the classrooms experience deficiency in terms of ventilation, heating and cooling equipment in accordance to the weather conditions, and furniture. The students were supposed to sit on the floor and as a consequence, were unable to concentrate on their studies (Bhunia, Kumar, &Duary, 2012).Over a decade of research has consistently confirmed that the physical environment impacts the learning environment and school achievement. In an era of data-driven decision making, one cannot ignore evidence that is quantified and specific (Cas&Twiford, 2010). Earthman emphasized that "when students are surrounded by a safe, modern and environmentally controlled environment, the facility will have a positive effect on their learning climate" (Earthman G.I. 2002,pp. 1-17). Jill, Debra and et al. (2011) research into the connection between built learning spaces and student outcomes; this literature review asked the question of the current literature on building environments: To what extent does the literature show connections between learning spaces and student learning outcomes in schools?

The primary aim of this paper is: Firstly, to focus on inter-district variation in terms of Infrastructure facility in Primary Schools of Rajasthan. Secondly, to analyse the status of relationship of infrastructure and educational attainment in government schools of Jaipur and Pratapgarh.

The conceptual framework is based on the literature review. It illustrates the condition of schools' infrastructure facilities and its' effect on the learning environment and

students' outcome.A school that is equipped with infrastructure facilities is likely to appreciate the better educational outcome than one that is deprived of these facilities (Mangipudy and Venkata, 2010).

Data Source : The paper is based on both primary data and secondary data. Secondary data for Infrastructure facility at Rajasthan level is procured from DISE District Report of 2016 17. Further, Infrastructure Index is calculated based on (State Education Quality Index) SEQI developed by MHRD and NITI AYOG which assess the performance of state and UTs in order to comprehensively transform school education in India. The SQEI is a subset of PGI , which is released by MHRD.Primary survey is conducted by the researcher in selected school of Jaipur and Pratapgarh.These schools are located in Kallaimohalla, Surajpol, Bagwas, Bamator, Dholikheda, Datod and Ambamata in Pratapgarh. Jagdamba, Chomu, Murlipura, Niwaru, Hatoj, Kalwad and Govindgarh in Jaipur. Indicator used for calculating infrastructure domain index are , 'School approachable by All Weather Road', 'playground facility', 'Boundary wall', 'Percentage of good condition of Classroom', 'Drinking Water', 'Electricity', 'Computer', 'Kitchen Shed', 'sitting arrangement', table -chair facility'.

METHODOLOGY

Mix blend of qualitative and quantitative methods have been used.Composite Indexis used for calculating Infrastructure Index.Geographic Information System, Arcmap 10 software has been used for creating the map, for showing inter-district variation of Infrastructure facility in Elementary School in Rajasthan. Correlation have been worked out to see relationshipbetween Infrastructure facility of Primary schools and Education attainment of students. 300 students were selected based on stratified random sampling method.For demonstrating the educational attainment/performance of students, their score/report card were used, which is a part of CCE methodology to group into various levels (Level One, Level Two and Level Three) according to their academic performance. 'Level One' student comprises of students who are doing well and can be said, they are forerunners in class who are faring well in all Evaluation. 'Level Two' students are categorised as those students who have potential and ability to perform better under proper guidance and direction from the teacher. Lastly, 'Level Three' students encompass the students who faring least in the academic front owing to various factors. These assessments were being done by the teacher and this data was used to make correlation with the infrastructure Composite Index of School.

RESULTS AND DISCUSSION

Section I: Performance of District on Infrastructure

Domain in primary schools of Rajasthan:

The present section is an analysis of spatial variation in status of infrastructure domain in Rajasthan.

The Table 1 showing the performance of districts on Infrastructure Domain in primary schools of Rajasthan. Significant variations have been observed among districts. It ranges from 11.27 (Composite Index of all indicator) in Sirohi district to -10.90 (Composite Index of all indicator) in Baran district of western Rajasthan. Based on the Composite Index of the all indicator (School Approachable by All Weather Road, Playground, Boundary wall, Percentage of Good Condition of Classroom, Drinking Water, Electricity computer, Kitchen Shed) the performance of district can be classified into 5 classes

These classes are Good performer, Moderate Performer, Bad Performer, worst Performer and Extremely worst performer. Map (1) clearly shows that line passing diagonally in alignment with Aravalli touching from Jhunjhunu, Jaipur, Ajmer, Bhilwara and Sirohi along with Kota in south eastern part of Rajasthan is doing good in terms Infrastructure domain in primary schools of Rajasthan. And worst performing district is the southern and Extreme eastern part of Rajasthan.

Table 1 : Performance of District on Infrastructure Domain in Primary Schools of Rajasthan (DISE 2016-17)

Districts	School Approachable by All Weather Road	Playground Facility	Boundary Wall	Percentage of Good Condition of Classroom	Drinking Water	Electricity	Computer	Kitchen Shed	Composite Index for Infrastructure
Ajmer	71.50	44.70	84.20	85.63	99.30	40.90	13.10	83.20	6.55
Alwar	63.40	29.00	71.50	81.02	90.00	20.50	6.40	82.10	-1.55
Banswara	72.20	20.80	30.00	67.84	94.60	8.10	2.50	74.00	-7.49
Baran	47.50	39.50	53.80	71.23	77.60	10.70	3.20	52.30	-10.89
Barmer	60.60	42.50	71.00	66.14	97.00	13.90	2.10	91.30	-1.49
Bharatpur	58.40	28.30	73.40	75.93	84.40	19.20	4.10	74.10	-4.97
Bhilwara	71.70	48.00	58.90	77.44	97.10	25.50	5.70	93.10	2.65
Bikaner	67.60	35.70	70.30	75.65	99.60	20.50	7.20	74.20	-0.05
Bundi	62.20	45.80	51.30	70.90	96.50	17.20	4.60	81.60	-2.05
Chittorgarh	70.70	51.10	76.70	80.05	96.90	26.50	8.80	49.00	1.07
Churu	64.70	29.70	91.30	76.02	99.60	35.70	12.40	89.30	3.18
Dhaulpur	72.30	13.60	87.60	76.68	83.50	9.80	7.40	62.00	-5.29
Dungarpur	77.00	23.30	46.50	65.37	95.20	9.80	3.90	67.50	-6.07
Dausa	68.60	35.20	68.20	78.98	96.60	11.30	5.00	75.00	-0.83
Ganganagar	73.20	33.70	84.30	81.12	99.70	43.60	5.90	95.10	5.31
Hanumangarh	70.90	32.10	78.10	83.43	99.40	35.20	6.10	92.10	4.01
Jaipur	75.10	43.50	75.20	86.46	97.20	33.70	17.90	75.70	5.37
Jaisalmer	50.20	25.90	76.90	72.26	97.40	16.80	3.70	83.30	-3.52
Jalore	58.10	36.00	82.20	67.39	96.60	14.40	3.90	83.00	-2.12
Jhalawar	60.30	39.70	71.00	75.31	96.10	9.80	1.10	71.30	-2.60
Jhunjhunu	77.10	44.10	84.70	82.77	100.00	64.40	9.20	91.40	8.52
Jodhpur	61.70	46.80	73.90	75.91	97.00	16.40	8.60	90.70	1.68
Karauli	59.00	31.90	65.10	70.63	86.00	12.00	3.30	66.20	-6.82
Kota	86.30	41.90	89.80	85.21	99.30	37.50	11.30	75.90	7.32
Nagaur	62.00	42.30	67.40	78.51	97.90	16.30	7.50	93.30	1.44
Pali	62.80	41.70	78.60	82.93	96.80	31.80	12.70	85.00	3.46
Pratapgarh	52.30	33.40	46.20	68.99	90.90	12.00	1.80	77.10	-7.35
Rajsamand	74.30	35.80	70.00	72.40	99.90	30.60	5.50	95.40	2.52
Sawai Madhopur	66.70	36.40	84.50	77.29	92.30	32.60	7.40	76.80	0.78
Sikar	69.60	47.90	79.70	83.21	96.90	17.80	7.60	82.40	3.59
Sirohi	69.70	35.80	81.00	80.20	98.80	92.40	59.40	78.30	11.26
Tonk	65.40	43.50	82.60	77.32	96.50	26.40	2.40	78.50	1.38
Udaipur	57.20	26.60	59.90	65.82	94.40	10.50	3.30	69.80	-7.00

Source: UDISE

Out of thirty three districts of Rajasthan, total 3 districts comes under category of Good Performer and falls in category of 6.83 to 11.27 (value of Composite Index) and performing well in all indicators of Infrastructure Domain. These districts are Sirohi, Jhunjhunu and Kota. Good performance in Infrastructure are attributed to the fact that, due awareness about education's importance has taken deep roots due to presence of coaching industry in Kota and Jhunjhunu. Here, male and female both are giving competition to each other in terms of output. So, a lot of governmental spending has been done in infrastructure of schools in all the infrastructure indices like school building, roads, drinking water facility , computer electricity, playground. Specially Sirohi and Kota are performing well in infrastructure wise whether it is access to road it scores 69%, 86% respectively or its good condition of classrooms and availability of safe drinking water it scores around 80 to 99%. Sirohi is far ahead Kota in computer and electricity accessibility. Out of 5 Aspirational Districts (As per classification done by NITI Aayog, 2018) Sirohi fall under category of Good Performer in Infrastructure Domain and is the frontrunner district , which sets an example for other districts to follow.

Out of Thirty three districts of Rajasthan 9 districts comes under Moderate performer and falls under category between 2.42 to 6.83 (Value of Composite Index). These districts are Ajmer, Jaipur, Ganganagar, Hanumangarh, Sikar, Pali, Churu, Bhilwara and Rajsamand. Among them Sikar and Churu are in better infrastructure facility category and scoring from 75 to 85% in good condition of classroom, with adequate drinking water facility scoring around 99% and poorly performing in computer availability. Jaipur infrastructure status is good in all the indicator, except availability of separate kitchen shed where only 75% schools has it. Being a state capital, it has influx of revenue expenditure which for school infrastructure purpose.

Ten Districts comes under category of bad performer, values falling in between -2.03 to 2.42 (Value of Composite Index).These districts include Jodhpur, Nagaur, Tonk, Chittorgarh, Sawai Madhopur, Bikaner, Dausa, Barmer, Alwar and Bundi . These districts are mostly eastern and southern most districts.

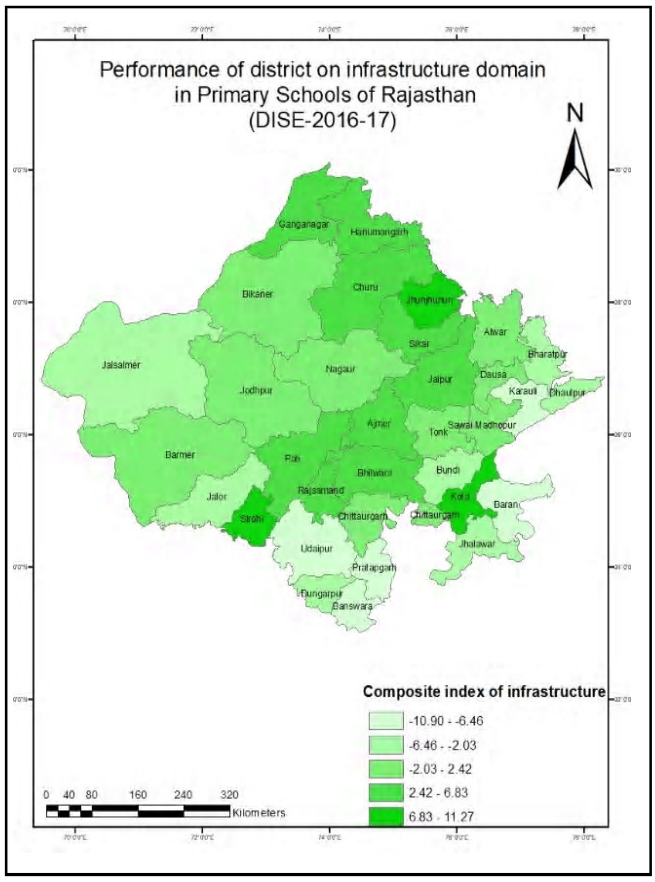

Table 2 : Number of District on Infrastructure Domain in primary schools of Rajasthan (DISE 2016-17)

	Good performer (6.83 to 11.27)	Moderate Performer (2.42 to 6.83)	Bad performer (-2.03 to 2.42)	Worst performer (-6.46 to -2.03)	Extremely Worst Performer (-10.90 to -6.46)
Total Districts	(3 districts) Sirohi, jhunjhunu, Kota	(9 Distrcits) Ajmer, Jaipur, Ganganagar, Hanumangarh, Sikar, Pali, churu, Bhilwara, Rajsamand	(10 districts) Jodhpur, Nagaur, Tonk, Chittorgarh, Sawai Madhopur, Bikaner, Dausa, Barmer, Alwar, Bundi	(6 Districts)Jalore, jhalawar, Jaisalmer, Bharatpur, Dhaulpur, Dungarpur	(5 Districts) Karauli, udaipur, pratapgarh, Banswara, Baran
Aspirational Districts	Sirohi			Jhalawar, Jaisalmer, Dhaulpur	Baran

Source: UDISE

Six districts of Rajasthan come under category of Worst performing districts. Composite value falling under category of (-6.46 to 2.03). These districts are Jalore, Jhalawar, Jaisalmer, Bharatpur, Dhaulpur, Dungarpur. (As per classification done by Niti Aayog, 2018) Jaisalmer and Dhaulpur falls under category of Worst Performer in Infrastructure Domain

Lastly, extremely worst performing districts are those, who have value of composite Index between -10.90 to 6.46. This situation is very depressing for School Infrastructure. Five districts comes under this category,i.e., Barmer and Karauli, Udaipur, Pratapgarh, Banswara, Baran. (As per classification done by Niti Aayog, 2018) Karauli and Baran falls under category of Extremely Worst Performer in Infrastructure Domain.

Lowest performing districts includes Baran, Pratapgarh, Udaipur and Banswara. Baran is the most depressed districts with composite index value of -10 and scoringless than 10% in the sub categories of computer and electricity availability. Reason of this low performance is their historical backwardness in education. South Rajasthan is mainly a tribal area standing on a very low infrastructure backbone. Now with effort of various schemes focusing on tribal schools, residential model school, various schemes and scholarship for tribal children, Pratapgarh, Banswara and Udaipur have embarked on the journey of education. Pratapgarh has performed in worst category in almost all the indicator, except drinking water which stood at 90%. In 2013-14, providing quality infrastructure across elementary and secondary schools was a major challenge that the government was encountering. 90% of schools had less than one classroom per grade with most of them lacking basic infrastructure like electricity connection and playground. However, in the past three years, a combination of policy interventions and proactive utilization of existing

Table 3 : School Infrastructure Facility and C.I. of Infrastructure In Surveyed Schools in Pratapgarh and Jaipur (2017-18)

District	School	Area	School approachable by Road	Boundry Wall	Play-ground	Safe drinking water	Working Toilet	Library	Computer	Electricity	Kitchen-shed	Sitting arrangement	Table-Chair	Infrastr-ucture Index
Pratapgarh	Kallai Mohalla	Urban	Yes	Yes	No	yes	Yes	Yes	No	Yes	Yes	Two class per room	Yes	12.73
Pratapgarh	Surajpol	Urban	Yes	Yes	Yes	yes	Yes	Yes	Yes	Yes	Yes	One Class per room	Yes	19.40
Pratapgarh	Bagwas	Urban	Yes	Yes	Yes	yes	Yes	No	No	Yes	Yes	Three class per room	Yes	11.23
Pratapgarh	Bamator	Rural	Yes	Yes	Yes	yes	No	No	No	Yes	No	Two class per room	No	6.68
Pratapgarh	Dholikheda	Rural	No	No	No	No	No	No	No	No	No	Three Class per room	No	1.17
Pratapgarh	Datod	Rural	Yes	Yes	Yes	No	No	No	No	No	No	Three Class per room	No	4.24
Pratapgarh	Ambamata	Rural	Yes	No	Yes	yes	No	No	No	Yes	Yes	Three Class per room	No	7.27
Jaipur	Jagdamba	Urban	Yes	Yes	No	yes	Yes	Yes	Yes	Yes	Yes	One Class per room	Yes	17.40
Jaipur	Chomu	Urban	Yes	Yes	No	yes	Yes	Yes	Yes	Yes	Yes	One Class per room	Yes	17.40
Jaipur	Murlipura	Urban	Yes	Yes	No	yes	No	No	No	Yes	Yes	Two class per room	Yes	6.43
Jaipur	Niwaru	Rural	Yes	Yes	Yes	yes	No	No	No	Yes	Yes	Two class per room	No	8.43
Jaipur	Hatoj	Rural	Yes	Yes	Yes	yes	No	No	No	Yes	No	Three Class per room	No	6.68
Jaipur	Kalawad	Rural	Yes	No	No	yes	No	No	No	Yes	No	Three Class per room	No	4.68
Jaipur	Govindgad	Rural	Yes	No	No	No	No	No	No	No	No	Three Class per room	No	2.24

Source: Primary survey

resources has improved the quality of school infrastructure in Rajasthan. schools today have separate toilets for girls and boys, and 24% provided electricity connections, 95% drinking water. Programmes such as Mukhmantri Jan Sahbhagita Vidyalaya Vikas Yojana have initiated, encouraged and incentivized community contributions towards infrastructure development.

Section II:

Performance of Surveyed School in Infrastructure Domain:

"Performance of Surveyed School in Infrastructure Domain" have beencategorised into "Good", "Medium" and "Poor". For categorising Schools into these categories. Same indicators have been used as that of Computing Infrastructure Index at Rajasthan Level.

As can be seen from the Table 4, that school's which performed better in terms of infrastructure are Surajpol and Jagadamba have performed best in the selected schools and scoring Composite Index of above 13.33. Next group of schools which have performed slightly less good are in the medium category, within the composer index of 13.33 to 7.26. These schools are Amba-Mata, kallai Mohalla, Bagwas and Niwaru. astly the schools which have performed worst are Dholikheda, Bamator, Datod, Murlipura Hatoj, Kalwad and Govindgarh. It is interesting to note that all the schools which are an urban centre of city have performed better. Example Surajpol, Jagadamba and Chomu are located in the heart of the city, so these schools have better infrastructure quality. The reason is attributed to the fact that these schools because of its central location have found donor and companies as a part of CSR obligation, have adopted these schools, and through this, these schools have got regular books, library, fans, table facilities and other infrastructural help. Whereas if you go away from the centre of the city the quality of infrastructure in school shows drastically declining trend and are in bad shapes. Rural area schools suffer lack of proper facilities to the extent that in some schools like Dholikheda which don't have a single facility of proper boundary playground, even drinking water was not in the premise of school and toilet was not in proper functionalstate.

Table 4 : Performance of Surveyed School in Infrastructure Domain in Pratapgarh and Jaipur (2017-18)

Sr. No.	Interval	Category	Schools
1.	29.42 - 21.7	Good	Surajpol, Jagdamba, Chomu
2.	21.6 - 13.98	Medium	Ambamata, Kallai Mohalla, Bagwas, Niwaru
3.	13.97 - 0	Bad	Dholikheda, Bamator, Datod, Murlipura, Hatoj, Kalwad, Govindagrh

Source: Primary Survey

Section III:

Correlation between education attainment of student and Infrastructure in Surveyed School of Jaipur and Pratapgarh:

In this section, firstly correlation have been workedbetween CI (composite Index) of infrastructure of Surveyed School and Education attainment of students through CCE in the report cards of students made by teachers in each school respectively.

As can be seen from the above table (5), that there is a significant correlation of value (.574*) between Composite Index of Infrastructure of Surveyed school and Academic performance of student of 'level one 'group in term of educational attainment. As can be seen that school of Bagwas with Composite Index like 11.23 had a greater number of students in 'level one'. Similarly, strength of 'level one' student it is good in Surajpol and

Table 5 : Correlations between Education Attainment of Students and Infrastrcture Composite Index (C.I.)

		Infra C.I.	Level_One	Level_Two	Level_Three
Infrastructure C.I.	Pearson Correlation	1	0.574*	.021	-.237
Level_One	Pearson Correlation	0.574*	1	-.189	.307
	Sig. (2-tailed)	.725		.518	.286
Level_Two	Pearson Correlation	.021	-.189	1	-0.51
	Sig. (2-tailed)	.415	.518		.021
Level_Three	Pearson Correlation	-.237	.307	-.610*	1
	Sig. (2-tailed)	.942	.286	.021	

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Primary Survey

Jagdamba school which have a greater number of students in 'level one'. Similarly, school where conducive condition have not been created in terms of infrastructure have a greater number of student in 'Level three'. This pattern was found in the Dadot, Govindgarh and Kalwad. So, this clearly shows that Infrastructure plays a very dominant role in students learning environment.So, now since we have acquired an understanding of characteristics of infrastructure, emphasis is put upon thefactors regarding how the infrastructural facilities prove to be advantageous in facilitating the achievement of educational goals. The infrastructural facilities within schools are indispensable.Therefore, it is imperative to formulate program and schemes by the government to promote in existing infrastructural facilities and bring about new infrastructure in school in urban and rural areas by engaging with communities through PPP Model to help in improving infrastructural facilities.

Conclusion:

Sufficient Infrastructure facilities are not present in government school. Most important facility like 'good condition of classroom' and 'table chair' and proper facility of 'sitting arrangement' are not provided to the student which is directly related to concentration of them.Other important facilities like computer is also not present in the school. This plays a very direct role in efficiency of teacher, as with the severe shortage of teacher and if computer is not available within premise of school, then teacher's time goes in waste in travelling for online academic work. As with the CCE scheme daily record needs to be updated online which burdens the teacher with non-academic work and no proper attention is available for academic work.School with separate working toilets for girls are not in proper condition, authorities have constructed the structure, but lack of water facility make it non-functional.Other facilities like 'school approachable by road', 'boundary wall', and 'separate kitchen shed' have performed well. There is positive and significant correlation between Infrastructure quality of school and education attainment of students.

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