



## A study on infrastructure disparities between public and private schools in Karnataka

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### Abstract

The research article deals with the performance of development amenities/ infrastructure and its impact on improvement of school education in Karnataka state. A Comparison of a six major infrastructure facilities available in the schools in 2012-13 to 2021-22 during the study period. They are library, computer, internet, functional boys and girls toilets, and drinking water facilities etc. The UDISE +2021-22 data shows that the some major infrastructural facilities have improved in 2021-22 compared to the previous year. For the first time, further disaggregated data on facilities have been presented separately for State Government Schools, private aided, Private unaided schools. The purpose of this study therefore was to establish the impact of development amenities on the improvement of quality school education in Karnataka. This study has examined the role that educational infrastructure have on influencing education, academic achievement and student health and well-being. The study focuses by two major objectives – to study the performance of school facilities in improving school education system in Karnataka, and to examine the development amenities and its impact on improving the quality of school education in Karnataka.

**Keywords:** Performance, infrastructure facilities, disparities, private and public

### Introduction

India has witnessed a massive expansion of its educational infrastructure and today it has one of the largest education networks, and third largest reservoir of science and technology work force in the world. India has a large school going population. To accommodate this school going population, it requires a strong educational infrastructure in order to keep pace with the developing economy and provide it with quality work force. Education can speed up economic growth and investment is a key indicator to expand and improve quality of education. Thus, Indian educations require more investment, which can lead to good quality education. School infrastructure is one of the most important roles to ensure the quality of teaching and learning with value to achieve quality of education (Sabarish.P-2015).

The infrastructure is the basic facilities and their use by the government/ school for smooth functioning of everything. It is widely known that availability of infrastructure facilities in school has considerable impact on school environment and it is one of the important indicators for assess whether the schools are provide a conducive learning environment for children. The performance of school facilities significantly affected on student success. School infrastructures can have a profound impact on both teacher and student outcomes. With respect to teachers, school facilities influence teacher recruitment, retention, commitment, and effort. With respect to students, school facilities affect health, behavior, engagement, learning, and growth in achievement (Madhumita Bandhopadhyay, 2009)<sup>[1]</sup>. Further, infrastructure facilities are not same across the school management types therefore this study attempt to compare the status of infrastructure between government, private aided and private unaided schools in Karnataka.

### Achievement of school education in Karnataka: Present scenario

Karnataka has fastest growing economy's growth is based on the knowledge base of the community. The State has embark on significant reforms in the education sector with increased public investment to make sure access, equity and quality in education, with community involvement. Hence, there are significant developments in all fields of education. In Karnataka, the literacy rate of 75.4 percent, this is above the national average of 73.0 percent as per Census of 2011. Female literacy rate, which was 56.87 percent in 2001, has been increased to 68.1 percent in 2011, which is above the National Average of 64.6 percent. Karnataka is India's seventh most urbanized state with 38.7 percent of population living in urban areas.

In the total number of schools, the percentage of Government education department's schools is as high as 85.42percent in lower primary schools and 59.24percent in higher primary schools. However, Department of Education has participation is lowing secondary education as Government manages only 28.12 percent of the high schools. The Government schools are mainly located in rural areas, where as private schools are largely urban based. During 2021-22, there were 67319 elementary schools in the State, of which 26316 were LPS and 40008 were HPS. In 2021-22, the State had 28278 lower primary, and 43591higher primary schools. The number of LPS decreased by 1096 and HPS is increased by 1258 between 2020-21 and 2021-22. There were 16752 high schools in the state during 2020-21 and 17507 schools in the year 2021-22. There is an increase of 1041 school during 2021-22 (UDISE+ Report-2021-22).

**Methodology**

The objective of the present study is to examine the trends in growth of infrastructure facilities and compare the performance of public and private school in Karnataka state. The study has used secondary data. The secondary sources of data have been collected from various reports of Unified District Information System of Education (UDISE+), Economic Survey of Karnataka 2022-23, Karnataka School Education Reports and websites. In order to examine the objective of the study, the collected data have been analysed by using tables, graphs. This paper

has been used statistical tools such as percentage and Compound Annual Growth Rate (CAGR) and ANOVA techniques.

**Result and discussion**

This section discuss about trends in school infrastructure at state level, for this purpose six important indicators have been selected for the analysis. They are number of functional boys’ and girls’ toilets, library, drinking water, computer facilities, and internet facilities in primary and upper primary schools.

**Table 1:** Number of Functional Boy’s Toilets to Number of School in Karnataka

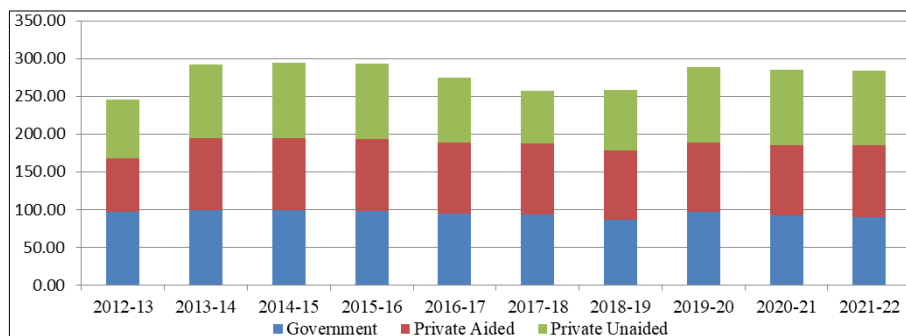
Year	Government	Percentage	Private Aided	Percentage	Private Unaided	Percentage
2012-13	22399	96.94	223	70.79	3141	77.46
2013-14	22771	99.29	294	95.77	4382	97.31
2014-15	22316	98.75	292	96.05	5261	99.02
2015-16	21957	97.76	290	95.71	5189	99.41
2016-17	20721	94.67	280	93.65	4889	86.90
2017-18	20284	93.96	271	93.45	3045	70.24
2018-19	18661	86.93	267	91.44	3203	79.60
2019-20	20408	96.39	246	92.83	3554	99.38
2020-21	19381	91.75	243	93.82	3500	99.15
2021-22	18881	89.85	229	95.02	3315	98.98
CAGR	-0.916		-0.897		-0.894	

Source: UDISE+

The table-1 reveals about the total number and percentage of schools having functional boy’s toilets in government, private aided and unaided primary and upper primary schools in Karnataka. In the year 2012-13 the total numbers of functional boy’s toilets in government schools were 22399 but it decreased to 18,881 in 2021-22 by 7.09 percent. Further it is also observed the declining trend in functional boy’s toilets. Whereas in aided schools the functional toilets have increased in the last year of the study compared to initial year. The similar kind of pattern is observed in case of private unaided schools also. The figure-

1 represents graphically the total number of functional boy’s toilets facilities in percentage for primary and upper primary schools’ government, private aided and unaided schools in Karnataka.

Further, results also indicate the number of functional boy’s toilet facilities is lower in government schools followed by private aided schools which are highest compare to other two types of schools. Therefore there is an in efficiency in management of toilets in government schools.



Source: UDISE+

**Fig 1:** Number of functional boy’s toilets to number of school in Karnataka

**Table 2:** Number of Functional Girls’ Toilets to Number of School in Karnataka

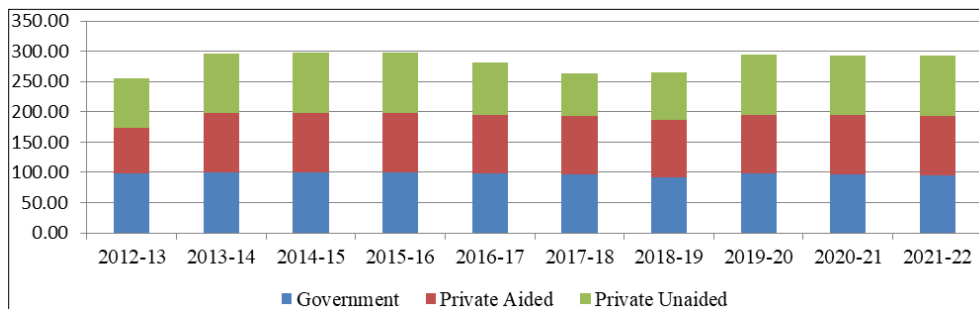
Year	Government	Percentage	Private Aided	Percentage	Private Unaided	Percentage
2012-13	22692	98.20	237	75.24	3291	81.16
2013-14	22902	99.86	301	98.05	4390	97.49
2014-15	22489	99.52	300	98.68	5265	99.10
2015-16	22270	99.15	299	98.68	5194	99.50
2016-17	21321	97.41	290	96.99	4899	87.08
2017-18	20800	96.35	279	96.21	3051	70.38
2018-19	19707	91.80	275	94.18	3200	79.52
2019-20	20897	98.70	256	96.60	3561	99.58
2020-21	20419	96.67	253	97.68	3505	99.29
2021-22	20086	95.58	237	98.34	3324	99.25
CAGR	-0.911		-0.900		-0.899	

Source: UDISE+

The table-2 shows the total number and percentage of functional girls’ toilets in government, private aided and unaided of primary and upper primary schools in Karnataka. In the year 2012-13 the total numbers of functional girls toilets in government schools were 22692 but it decreased to 20086 in 2021-22 by 2.62 percent. Further it is also observed a declining trend in functional girls’ toilets. Whereas in aided schools the functional toilets have increased in the years of the study compared to initial year. The similar kind of pattern is observed in case of private unaided schools also. The figure-2 indicates that availability of functional girls’ toilets in percentage among government,

private aided and unaided upper primary schools in Karnataka for the period of 2012-13 to 2021-22. The figure-2 reveals about number of functional girls toilet facilities in percentage among government, private aided and unaided primary and upper primary schools in Karnataka for the period of 2012-13 to 2021-22.

Further, results also indicate the number of functional girls’ toilet facilities is lower in government schools followed by private aided schools with 98.34 percent, but it is 99.25 in private unaided schools which are highest compare to other two types of schools.



Source: UDISE+

Fig 2: Number of functional girls’ toilets to number of school in Karnataka

Table 3: Number of Library Facilities to Number of school in Karnataka

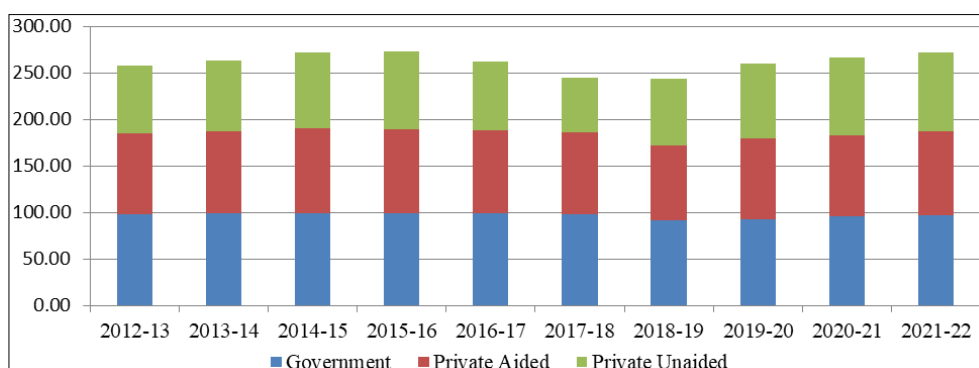
Year	Government	Percentage	Private Aided	Percentage	Private Unaided	Percentage
2012-13	22622	97.90	273	86.67	2954	72.85
2013-14	22727	99.10	271	88.27	3425	76.06
2014-15	22515	99.63	275	90.46	4350	81.87
2015-16	22375	99.62	272	89.77	4372	83.75
2016-17	21745	99.35	266	88.96	4158	73.91
2017-18	21228	98.33	255	87.93	2545	58.71
2018-19	19549	91.07	235	80.48	2916	72.47
2019-20	19720	93.14	228	86.04	2884	80.65
2020-21	20203	95.64	227	87.64	2933	83.09
2021-22	20408	97.12	216	89.63	2871	85.73
CAGR	-0.910		-0.921		-0.903	

Source: UDISE+

The table-3 represents the total number and percentage of library facilities in government, private aided and unaided of primary and upper primary schools in Karnataka. In the year 2012-13 the total numbers of library facilities in government schools were 22622 but it decreased to 20408 in 2021-22 by 0.78 percent. Further it is also observed a declining trend in library facilities. In aided schools also the library facilities have decreased in the last year of the study compared to

initial year. The similar kind of pattern is observed in case of private unaided schools also. These results are also observed from the figure-3

Further, results also indicate the number of library facilities is higher in government schools followed by private aided schools with 89.63 percent, but it is 85.73 in private unaided schools which are lowest compare to other two types of schools.



Source: UDISE+

Fig 3: Number of library facilities to number of school in Karnataka

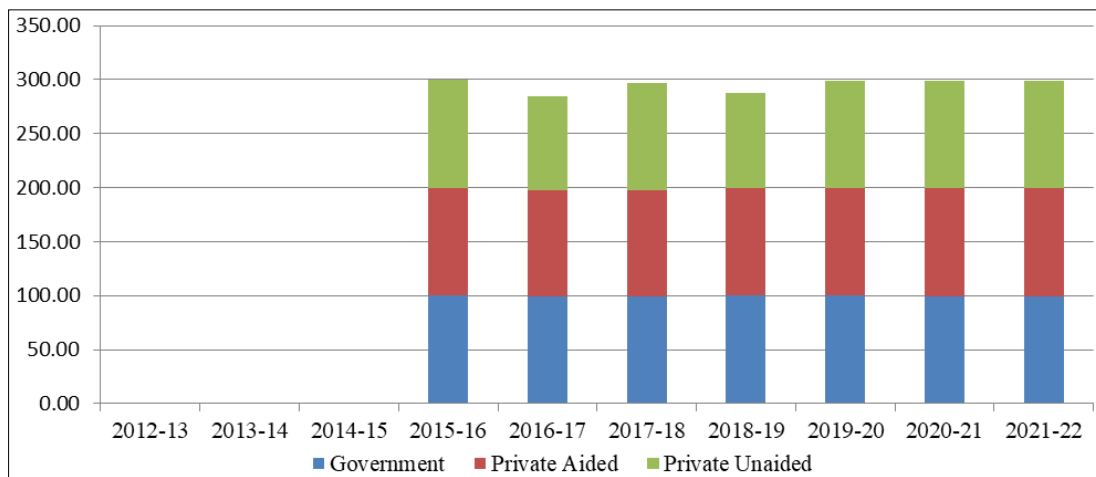
**Table 4:** Drinking water facilities to number of school in Karnataka

Year	Government	Percentage	Private Aided	Percentage	Private Unaided	Percentage
2012-13	0	0.00	0	0.00	0	0.00
2013-14	0	0.00	0	0.00	0	0.00
2014-15	0	0.00	0	0.00	0	0.00
2015-16	22455	99.97	303	100.00	5215	99.90
2016-17	21783	99.52	292	97.66	4922	87.49
2017-18	21470	99.45	284	97.93	4332	99.93
2018-19	21466	100.00	290	99.32	3573	88.79
2019-20	21120	99.75	264	99.62	3575	99.97
2020-21	21023	99.53	259	100.00	3524	99.83
2021-22	20920	99.55	241	100.00	3343	99.82
CAGR	-0.907		-0.920		-0.936	

Source: UDISE+

The table-4 represents the total number and percentage of schools having drinking water facility among government, private aided and unaided primary and upper primary schools from the year 2012-13 to 2021-22. Total numbers 20920 schools have drinking water facility in government schools. In private aided 241 schools and in unaided 3343 schools have the drinking water facility in 2021-22 in Karnataka. The figure -15 reveals about the availability of

drinking water facilities in percent among government, private aided and unaided primary and upper primary schools in Karnataka for the period of 2012-13 to 2021-22. The results also reveal that the number of drinking water facilities is almost similar between government, private aided and private unaided schools, whereas it is lower for government school with value of 99.55 percent.



Source: UDISE+

**Fig 4:** Drinking water facilities to number of school in Karnataka

**Table 5:** number of computer to number of school in Karnataka

Year	Government	Percentage	Private Aided	Percentage	Private Unaided	Percentage
2012-13	941	4.07	80	25.40	1828	45.08
2013-14	1043	4.55	78	25.41	2101	46.66
2014-15	1575	6.97	87	28.62	2783	52.38
2015-16	1506	6.70	91	30.03	2812	53.87
2016-17	1672	7.64	88	29.43	2690	47.81
2017-18	1595	7.39	94	32.41	1508	34.79
2018-19	1945	9.06	74	25.34	1588	39.46
2019-20	1909	9.02	78	29.43	1831	51.20
2020-21	1767	8.37	74	28.57	2086	59.09
2021-22	2366	11.26	86	35.68	2379	71.04
CAGR	-0.749		-0.893		-0.870	

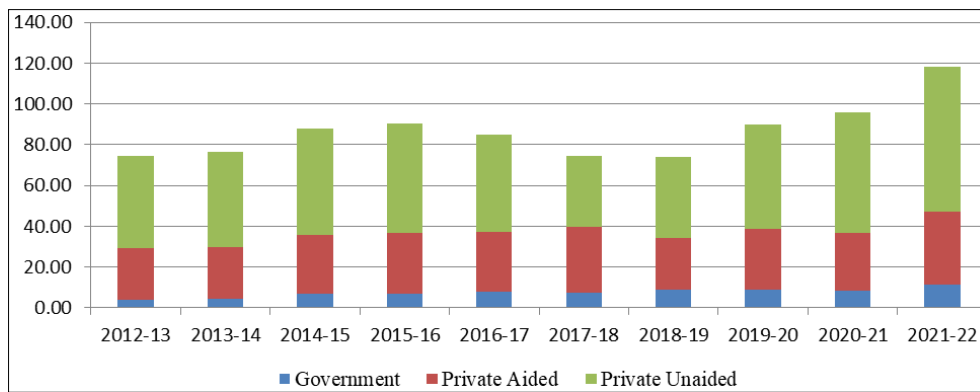
Source: UDISE+

The table-5 shows the total number and percentage of computer facilities in government, private aided and unaided of primary and upper primary schools in Karnataka. In the year 2012-13 the total numbers of computer facilities in government schools were 941 but it increased to 2366 in 2021-22 by 7.19 percent. Further it is also observed a declining trend in computer facilities. Whereas in aided

schools the computer facilities have increased in the year of the study compared to initial year. The different kind of pattern is observed in case of private unaided schools. The figure-5 reveals about that number of computer facilities in percentage among government, private aided and unaided primary and upper primary schools in Karnataka for the period of 2012-13 to 2021-22.

Further, results also indicate the number of computer facilities is lower in government schools followed by private aided schools with 35.68 percent, but it is 71.04 in private

unaided schools which are highest compare to other two types of schools.



Source: UDISE+

Fig 5: Number of computer to number of school in Karnataka

Table 6: Internet facilities to number of school in Karnataka

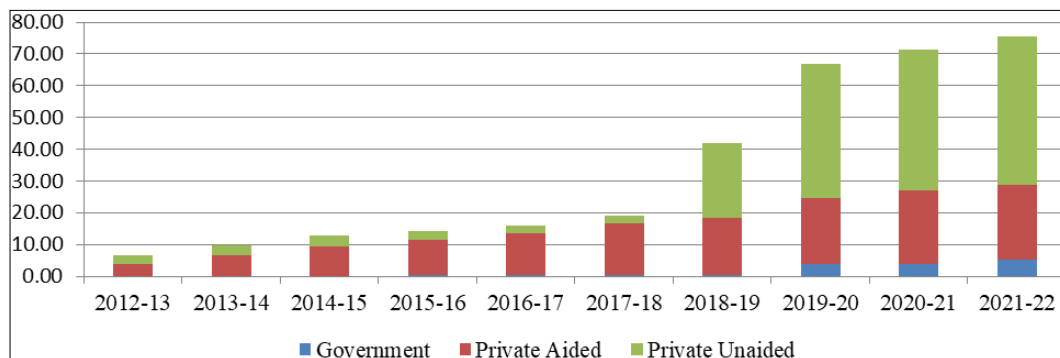
Year	Government	Percentage	Private Aided	Percentage	Private Unaided	Percentage
2012-13	23	0.10	12	3.81	108	2.66
2013-14	29	0.13	20	6.51	137	3.04
2014-15	35	0.15	28	9.21	178	3.35
2015-16	43	0.19	34	11.22	147	2.82
2016-17	50	0.23	40	13.38	141	2.51
2017-18	59	0.27	47	16.21	110	2.54
2018-19	66	0.31	53	18.15	938	23.31
2019-20	816	3.85	55	20.75	1515	42.37
2020-21	832	3.94	60	23.17	1564	44.31
2021-22	1089	5.18	57	23.65	1562	46.64
CAGR	3.735		-0.525		0.446	

Source: UDISE+

The table-6 reveals about the total number and percentage of Internet facilities in government, private aided and unaided of primary and upper primary schools in Karnataka. In the year 2012-13 the number of government schools having internet facilities were only 23, which was only 1% of the total schools. The total numbers of Internet facilities in government schools were 23 but it increased to 1089 in 2021-22 to with a percentage 5.08. Whereas in aided schools the Internet facilities have increased in the year of the study compared to initial year. The figure-6 shows about

number of Internet facilities in percentage among government, private aided and unaided primary schools in Karnataka for the period of 2012-13 to 2021-22.

Further, results also indicate the number of Internet Facilities is lower in government schools followed by private aided schools with 23.65 percent, but it is 46.64 in private unaided schools which are highest compared to other two types of schools. There is a part in internet facilities for private unaided school after 2018-19. It is increased from 2.54 in 2017-18 to 23.31 in 2018-19.



Source: UDISE+

Fig 6: Internet facilities to number of school in Karnataka

From the above discussion about the status and trends in school infrastructure it is found that toilets facilities, library facilities, drinking water facilities are good both in public

and private schools. But the percentage of schools having computer and internet facilities are very low in public schools compare to private schools.

**Table 7:** ANOVA results for infrastructure facilities among government, private aided and private unaided schools in Karnataka

One Way ANOVA						
	Group	Sum of squares	df	Mean square	F	Sig.
Functional Boys Toilet	Between Groups	80.010	2	40.005	.602	.555
	Within Groups	1795.662	27	66.506		
	Total	1875.672	29			
Functional Girls Toilet	Between Groups	189.483	2	94.741	1.634	.214
	Within Groups	1565.097	27	57.967		
	Total	1754.580	29			
Library Facilities	Between Groups	2038.721	2	1019.360	37.686	.000
	Within Groups	730.314	27	27.049		
	Total	2769.035	29			
Drinking Water Facilities	Between Groups	28.304	2	14.152	.006	.994
	Within Groups	61313.443	27	2270.868		
	Total	61341.747	29			
Computer Facilities	Between Groups	7960.826	2	3980.413	8.494	.001
	Within Groups	12652.614	27	468.615		
	Total	20613.439	29			
Internet Facilities	Between Groups	1448.017	2	724.008	4.909	.015
	Within Groups	3982.324	27	147.493		
	Total	5430.340	29			

Source: Compiled by Authors

The results of ANOVA for infrastructure facilities across government, private aided and private unaided schools are presented in the Table-7.

Results of ANNOVA for the mean differences in functional boys, girls toilets and drinking water facilities show that there is no significant differences across management wise. This is because of percentage of school among all the types having above infrastructure facilities are similar. Therefore the ‘P’ values for these facilities are greater than 10 percent significant level.

But there is a difference in the percentage of schools having library, computer and internet facilities this can be observed from the calculated ‘F’ value and their probability values in the table which are less than 5 percent level of significant.

The above results reveal that out of six infrastructure indicators selected for the analysis three are statistically, significantly different among government, private aided and private unaided schools.

**Table 8:** Results of post Hoc tests

Type of Schools	Subset for Alpha = 0.05				
	Variable	N	1	2	3
Functional Boys Toilet	Private unaided	10	90.745966475762340		
	Private Aided	10	91.852677200828960		
	Government	10	94.628409063722960		
	Sig.		.325		
Functional Girls Toilet	Private unaided	10	91.235526467199210		
	Private Aided	10	95.065014188672180		
	Government	10	97.324434719683800		
	Sig.		.101		
Library Facilities	Private unaided	10	76.908210581857830		
	Private Aided	10		87.585256226566220	
	Government	10			97.089531476374550
	Sig.		1.000	1.000	1.000
Drinking Water Facilities	Private unaided	10	67.573683212982540		
	Private Aided	10	69.452760736159850		
	Government	10	69.777125660522770		
	Sig.		.923		
Computer Facilities	Government	10	15.702358890212219		
	Private Aided	10		35.916876743437000	
	Private Unaided	10		55.603137181215025	
	Sig.		1.000	.052	
Internet Facilities	Government	10	1.435655931511624		
	Private Aided	10		14.606353055193011	
	Private Unaided	10		17.353851456083700	
	Sig.		1.000	.617	

Source: Compiled by Authors

The results of post hoc test for comparing the significant differences in the selected infrastructure variables among three management types show that only in three variables

there is a individual differences mainly library, computer and internet facilities.

All the three types of schools have a significant mean difference in library facilities, computer and internet facilities. Private aided and private unaided schools are having more facilities compare to government schools. From these results it is observed that private aided and private unaided schools are having better infrastructure facilities in Karnataka.

### Conclusion

The purpose of the study was to analyse the trends in infrastructure facilities for three management schools in Karnataka. Maintaining school infrastructure facilities is of the most important aspect to provide high quality education. The research article highlighted that the impact of quality improvement initiatives for school education and various infrastructure facilities on school education students in Karnataka. The study found that school facilities impact teaching and learning in thoughtful ways. Yet state and local policy makers often overlook the impact facilities can play in improving outcomes for both teachers and students. Clearly, school facilities play a significant role in school education and students' development. The purpose of the study was to analyse the trends in number of schools and enrolment in primary and upper primary schools in Karnataka by divided the schools in to government, private aided and private unaided. It is also found that there is a fluctuating trend in library, computer and internet facilities. The difference in All the three types of schools have a significant mean difference in library facilities whereas in other to that is computer and internet private aided and private unaided schools are having more facilities compare to government schools. From these result it is observed that private aided and private unaided schools are having better infrastructure facilities in Karnataka.

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