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Availability of ICT Devices for Computer Education in Rural Government and Private Schools of Punjab**Deepkamal Mann**

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ABSTRACT

This paper is based on the study to examine the difference between government and private schools of rural areas towards the availability, working and non-working of ICT devices of computer laboratories. The study adopted the descriptive survey technique. The data has been collected from the purposively selected sample of 18 rural-area government and private senior secondary schools of Punjab state where computer laboratories have been established. Results revealed that most of the schools have sufficient number of computers/laptops in computer lab/s. The private schools are well ahead than government schools with respect to the availability and maintenance of computers, invertors/UPSs and speakers in the computer lab/s. Even though, government schools are better placed regarding the availability of printers and headphones in computer lab/s, but are also lagging behind to catch up them in working condition. Availability of projectors, scanners and mics/microphones is very poor in computer lab/s of the sampled schools. Further, the percentage of government schools is higher than private ones for providing the internet facility in computer lab/s, but private schools have an upper hand regarding the regular and high speed of internet connectivity in computer lab/s.

Keywords: Computer Laboratories, ICT, Government and Private Schools**INTRODUCTION**

Today's time is the time of digital technology. The computer education is needed for students to possess the computer and technological skills for their future careers and daily life activities. Firstly, Computer Literacy and Studies in School (CLASS) Project was initiated in the year of 1984-85 by the Central Government of India as a pilot project with a motive to provide the computers to the secondary and senior secondary schools. The National Policy on Education 1986, as revised in 1992, also proposes to provide the computer education in secondary-level schools with a motive to develop the necessary computer skills among the students for their successfully surviving in the present technological world. So that CLASS project was adopted as a Centrally Sponsored Scheme in the 8th Five Year Plan (1993-1998) and revised by the 10th Five Year Plan (2002-2007).

In 2004, a more comprehensive Centrally Sponsored Scheme, namely National Policy on Information and Communication Technology (ICT) in School Education (lastly revised in March

2012), was launched to improve ICT literacy as well as competency among the students, to update the ICT infrastructure of schools and to promote the use of ICT for teaching-learning process. But this scheme has been merged in Rashtriya Madhyamik Shiksha Abhiyan during the year of 2014. The scheme is a major catalyst to bridge the digital divide amongst students from different socio-economic and geographical backgrounds. The scheme supported the establishment of computer labs (EQFI, 2015: 10).

Under centrally sponsored ICT in School Education Scheme, the state government of Punjab has set up the Punjab ICT Education Society (PICTES) in 2004-05 with an intend to provide compulsory computer literacy for sixth to twelfth classes in the government and government-aided schools. This compulsory computer literacy program has been implemented by the PICTES in the phased manner among the government and government-aided schools.

During the implementation of computer literacy program, many schools, especially remote or rural government schools, have faced the various challenges responsible for the digital divide ranging from insufficient ICT infrastructure, dysfunction of ICT devices, lack of internet connectivity, irregular electricity supply, inadequate funds, inadequate technical assistance, etc. This paper has tried to find out and compare the availability of various ICT devices in the computer laboratories of rural government and private schools of Punjab.

REVIEW OF RELATED LITERATURE

GOI (n.d.) conducted the study to evaluate the ICT@School Scheme in Mizoram. This study was carried on 60 head masters, 60 ICT teachers, 240 subject teachers and 240 students of 60 schools (52 government schools and 8 government-aided schools) from 6 selected districts of Mizoram. As per the findings related to ICT education, it was revealed that lack of computer laboratories, insufficient number of computers, lack of internet connectivity, erratic electricity supply, unavailability of separate and qualified computer teachers, absence of computer education curriculum, inadequate funds, inadequate technical assistance, lack of training and unavailability of generators were major barriers faced by government and government-aided schools.

Christopher and Maria-Gorretti (2012) conducted the study to investigate the availability and usage of computers as well as internet among students of Nigerian secondary schools in Benin City. For this investigation, 20 private secondary schools with 1000 students were selected. In results, students realized that even though there was the availability of computers in the computer laboratories but the number of computers was not sufficient and a limited percentage of computers were connected with internet. The outcomes further added that the internet access by students in schools was very poor whereas they accessed the internet from cyber-cafes as well as from their homes.

GOI (2013) aimed to evaluate the ICT@School Scheme in Punjab. For this purpose, 1184 students, 107 ICT teachers and 422 teachers were taken from 61 government schools of 6 selected districts of Punjab state. The results concerning with ICT education exposed that dysfunction of computers and UPSs, insufficient IT infrastructure, involvement of ICT teachers in doing non-academic work, insufficient number of computers, internet problem, erratic electricity supply, absence of regular computer education curriculum review, lack of special/regular training and unavailability of generators were main obstacles which had been raised by ICT teachers and students.

Kwache (2013) undertook a study to critically examine the role of computer education for the improvement of secondary-level education. For questionnaire survey, sample consisted of 20 management staff, 38 teachers and 92 students of six selected secondary schools in Jimeta Metropolis of Adamawa State (Nigeria). But only 13 management staff, 21 teachers and 72 students filled the questionnaire and returned back to the author. The findings revealed that computer education has an important role for the improvement of secondary education. But it was also realized that majority of schools, especially public schools, did not start the computer education as a separate subject and those

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schools, which taught the computer education to their students, had faced various challenges like unavailability of qualified computer teachers, lack of computers, irregular power supply, etc.

Gakunga and Mwikali (2016) aimed to find out the impact of availability of computer facilities upon the private and public school students' choice of computer studies. For this, 110 computer studies students, 13 computer studies teachers and 13 head teachers of Kenyan private secondary schools as well as 107 computer studies students, 12 computer studies teachers and 12 head teachers of Kenyan public secondary schools were considered for questionnaire survey. But 100 students, 12 teachers and 12 head teachers of private schools sent back the filled questionnaire whereas 100 students, 11 teachers and 11 head teachers of public schools gave back the filled questionnaire. As per the findings of study, respondents believed that availability of computer facilities made a significant impact upon the both private as well as public school students' choice of computer studies. The results also revealed that private schools were better equipped than public ones with respect to the computer equipments/facilities, internet facility and computer studies books.

Singh (2018) conducted the study to explore the status of 'ICT@Schools' Scheme and its implication upon the students of Bihar government schools. For this purpose, a total sample of 1551 students were taken from 87 government schools of selected districts having the implementation of this scheme. As per the findings of study, it was discovered that ICT Labs were very poor in condition with respect to the availability for students. The outcomes also proved that students had rarely accessed the ICT Labs due to the lack of computer teachers, lack of internet facility and theft/lost/non-working of ICT devices, but gender variable did not affect their perceptions towards the use of ICT in schools.

Bariu (2020) attempted to measure the status of ICT infrastructure in teaching and learning in secondary schools of Kenya through questionnaires, interviews and observation schedules. For this study, sample was drawn from principals, teachers and students. As per the results of study, it was revealed that most of sampled schools had non-availability as well as poor state of ICT infrastructure (i.e. computers, internet, printer, scanner, cameras and photocopiers). Also, it was realized that higher prices of computers, software and other related ICT devices delimited the most of schools to invest in ICT infrastructure.

OBJECTIVES

This paper is based on the study with following main objectives:

1. To study the availability of ICT devices in computer laboratories of rural-area government and private schools in Punjab State.
2. To study the difference between government and private schools of rural areas regarding the working and non-working of ICT devices available in computer laboratories.

METHODOLOGY

This study was conducted by employing a descriptive survey method. The investigator collected the information regarding the availability of ICT devices from government and private schools of rural Punjab through a self-prepared Institutional Inventory.

Sample: Three districts from three geographical regions of the state of Punjab, namely Hoshiarpur (Doaba), Mansa (Malwa) and Tarn Taran (Majha), were chosen as sample districts for this study. The samples of study were 18 rural-area senior secondary schools of Punjab state, consisting of 9 government schools and 9 private schools, selected purposively from three selected districts of Punjab state where computer laboratories have been established. The detailed distribution of the sample is given in the Table 1.

Table 1: Detailed Distribution of Sample

District	Region	Rural Area		Total
		Government School	Private School	
Hoshiarpur (having Highest Literacy Rate)	Doaba	3	3	6
Mansa (having Lowest Literacy Rate)	Malwa	3	3	6
TarnTaran (Border District)	Majha	3	3	6
Total		9	9	18

Procedure for Data Collection: Researcher herself visited to the sampled schools and contacted the concerned authorities of these schools to get the permission to conduct the data from them as per the need. Before giving the Institutional Inventory to the concerned personnel, researcher explained the purpose of data collection and described the instructions on how to fill. Then, the researcher collected back the Institutional Inventory when it was completely filled. Further, the data collected from different school was tabulated for its analysis and interpretation as per the objectives of the study.

STUDY FINDINGS

The findings of this study related to the availability of ICT devices of computer laboratories (computer labs) as well as the comparison regarding the working and non-working of these devices in rural-area government and private schools in Punjab State are as follows:

1. Availability of Computers/Laptops

Table 2 indicates that among all the rural-area secondary schools taken for the study, about 5.5% are having 1 to 10 computers/laptops with them in computer lab/s. 22.2% have reported 11-20 computers/laptops with them. Nearly 55.6% have reported that they possess between 21 to 30 computers/laptops and remaining 16.7% schools are observed to possess more than 30 computers/laptops. Further, nearly 77.8% government schools are found to possess 21-30 computers/laptops in their computer lab/s while equal percentage of private schools have reported 11-20, 21-30 and more than 30 computers/laptops in computer lab/s.

Table 2: Availability of Computers/Laptops in the Computer Lab/s

Number of Computers/ Laptops	Number of Schools		
	Government School	Private School	Total
1-10	1 (11.1%)	0	1 (5.5%)
11-20	1 (11.1%)	3 (33.3%)	4 (22.2%)
21-30	7 (77.8%)	3 (33.3%)	10 (55.6%)
More than 30	0	3 (33.4%)	3 (16.7%)
Total	9 (100%)	9 (100%)	18 (100%)

From Table 3, it is clear that out of total 447 computers/laptops available in computer labs, 92.4% units of computers/laptops are in working condition. It is also seen that private schools are way ahead than government schools in providing computers/laptops as resource in their computer lab/s as well as in maintaining these computers/laptops in the working condition.

Table 3: Number of Working and Non-Working Units of Computers/Laptops

Computers/Laptops			
	Government School	Private School	Total
Number of Working Units	161 (84.3%)	252 (98.4%)	413 (92.4%)
Number of Non-Working Units	30 (15.7%)	4 (1.6%)	34 (7.6%)
Total	191 (100%)	256 (100%)	447 (100%)

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2. Availability of Projectors

It has been observed from the Table 4 that only 1 government school (11.1%) has reported the availability of one projector in computer lab/s. But this projector is found to be in non-working condition (Table 5).

Table 4: Availability of Projectors in the Computer Lab/s

Number of Projectors	Number of Schools		
	Government School	Private School	Total
0	8 (88.9%)	9 (100%)	17 (94.4%)
1	1 (11.1%)	0	1 (5.6%)
Total	9 (100%)	9 (100%)	18 (100%)

Table 5: Number of Working and Non-Working Units of Projectors

Projectors			
	Government School	Private School	Total
Number of Working Units	0	0	0
Number of Non-Working Units	1 (100%)	0	1 (100%)
Total	1 (100%)	0	1 (100%)

3. Availability of Inverters/UPSs

It is noted from Table 6 that two-third of schools are having up to 10 inverters/UPSs in their computer lab/s. About 5.5% have 11-20 inverters/UPSs while remaining 27.8% schools have been observed to possess more than 20 inverters/UPSs (Table 6). Table 6 also reveals that 100% government schools are observed to possess 1 to 10 inverters/UPSs in computer lab/s whereas more than half of private schools are having more than 20 inverters/UPSs

Table 6: Availability of Inverters/UPSs in the Computer Lab/s

Number of Inverters/UPSs	Number of Schools		
	Government School	Private School	Total
1-10	9 (100%)	3 (33.3%)	12 (66.7%)
11-20	0	1 (11.1%)	1 (5.5%)
More than 20	0	5 (55.6%)	5 (27.8%)
Total	9 (100%)	9 (100%)	18 (100%)

Further, there are total 231 inverters/UPSs available in the computer labs of sampled schools and 95.7% of them are working. It is also observed that a very vast majority of them are available in computer lab/s of private schools whereas government schools have very nominal number of inverters/UPSs as power backups in their computer lab/s. Non-working condition of inverters/UPSs in computer lab/s is also a considerable issue for government schools because approximately 72.7% inverter/UPS units available in computer lab/s of government schools are found to be non-working whereas just 0.9% of inverters/UPSs of private schools are non-working (Table 7).

Table 7: Number of Working and Non-Working Units of Inverters/UPSs

Inverters/UPSs			
	Government School	Private School	Total
Number of Working Units	3 (27.3%)	218 (99.1%)	221 (95.7%)
Number of Non-Working Units	8 (72.7%)	2 (0.9%)	10 (4.3%)
Total	11 (100%)	220 (100%)	231 (100%)

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4. Availability of Printers

It is evident from the Table 8 that out of the total 18 rural-area schools, one-third of schools are without any printer with them in computer lab/s whereas majority of schools are equipped with one or two printer/s.

Further, the Table 8 shows that all the government schools have 1 or 2 unit/s of printers in their computer lab/s. On the other hand, private schools are far behind than government schools regarding the availability of printers in their computer lab/s. Only one-third of private schools have confirmed the availability of printers in computer lab/s.

Table 8: Availability of Printers in the Computer Lab/s

Number of Printers	Number of Schools		
	Government School	Private School	Total
0	0	6 (66.7%)	6 (33.3%)
1	4 (44.4%)	1 (11.1%)	5 (27.8%)
2	5 (55.6%)	1 (11.1%)	6 (33.3%)
4	0	1 (11.1%)	1 (5.6%)
Total	9 (100%)	9 (100%)	18 (100%)

On perusal of the below Table 9, it is clear that 90.5% printer units available in computer labs are in working order. About 92.9% of government schools' printers in computer lab/s are working in comparison to 85.7% of working printers in computer lab/s of private schools. So the government schools are ahead in having and maintaining the printers in the working condition than private counterparts.

Table 9: Number of Working and Non-Working Units of Printers

Printers			
	<i>Government School</i>	<i>Private School</i>	<i>Total</i>
Number of Working Units	13 (92.9%)	6 (85.7%)	19 (90.5%)
Number of Non-Working Units	1 (7.1%)	1 (14.3%)	2 (9.5%)
Total	14 (100%)	7 (100%)	21 (100%)

5. Availability of Scanners

Table 10 presents that majority of the schools (72.2%) have not claimed any scanner in their computer lab/s. Only 22.2% government schools have the facility of one scanner in their computer lab/s in comparison to 11.1% private schools. Further, one government school (11.1%) has reported 2 scanners in computer lab/s whereas one private school (11.1%) has been found to possess three scanners in computer lab/s.

Table 10: Availability of Scanners in the Computer Lab/s

Number of Scanners	Number of Schools		
	Government School	Private School	Total
0	6 (66.7%)	7 (77.8%)	13 (72.2%)
1	2 (22.2%)	1 (11.1%)	3 (16.7%)
2	1 (11.1%)	0	1 (5.6%)
3	0	1 (11.1%)	1 (5.5%)
Total	9 (100%)	9 (100%)	18 (100%)

It is clear from the Table 11 that there are equal number of scanner units available in computer lab/s of government schools as well as in computer lab/s of private schools under this study and all units are found to be in working condition.

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Table 11: Number of Working and Non-Working Units of Scanners

Scanners			
	Government School	Private School	Total
Number of Working Units	4 (100%)	4 (100%)	8 (100%)
Number of Non-Working Units	0	0	0
Total	4 (100%)	4 (100%)	8 (100%)

6. Availability of Speakers

On observing the Table 12, it is found that about 61.1% schools have denied the availability of speakers in their computer lab/s and 11.1% schools are equipped with a single speaker in computer lab/s. Further, 11.1% schools are having 2 speakers while 16.7% have been found to possess 4 speakers in computer lab/s. Table 12 also shows that the private schools are comparatively 6 times ahead than government schools in providing the speaker units in the computer lab/s. Thus a disappointing observation about government schools is that nearly 88.9% government schools are without any speakers.

Table 12: Availability of Speakers in the Computer Lab/s

Number of Speakers	Number of Schools		
	Government School	Private School	Total
0	8 (88.9%)	3 (33.3%)	11 (61.1%)
1	0	2 (22.2%)	2 (11.1%)
2	0	2 (22.2%)	2 (11.1%)
4	1 (11.1%)	2 (22.3%)	3 (16.7%)
Total	9 (100%)	9 (100%)	18 (100%)

It is observed from Table 13 that all the speaker units (100%) are in working order and private schools are much ahead than government schools in providing the number of speaker units in their computer lab/s.

Table 13: Number of Working and Non-Working Units of Speakers

Speakers			
	Government School	Private School	Total
Number of Working Units	4 (100%)	14 (100%)	18 (100%)
Number of Non-Working Units	0	0	0
Total	4 (100%)	14 (100%)	18 (100%)

7. Availability of Headphones

It can be seen from Table 14 that 44.4% schools have no headphone in their computer lab/s whereas 16.7% schools have affirmed the facility of 1 to 10 headphones. About 22.2% have 11-20 headphones and 16.7% schools have responded positively for the availability of more than 20 headphone units in their computer lab/s.

Table 14: Availability of Headphones in the Computer Lab/s

Number of Headphones	Number of Schools		
	Government School	Private School	Total
0	1 (11.1%)	7 (77.8%)	8 (44.4%)
1-10	1 (11.1%)	2 (22.2%)	3 (16.7%)
11-20	4 (44.5%)	0	4 (22.2%)
More than 20	3 (33.3%)	0	3 (16.7%)
Total	9 (100%)	9 (100%)	18 (100%)

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From the Table 14 and Table 15, it is also clear that government schools are extremely ahead than private schools regarding the availability and the number of headphones in their computer lab/s. But the government schools are lagging behind to keep up these headphone units in working condition. About 48.6% headphone units of government schools available in their computer lab/s are not working while 100% headphone units of private schools available in their computer lab/s have been observed to be in working condition.

Table 15: Number of Working and Non-Working Units of Headphones

Headphones			
	Government School	Private School	Total
Number of Working Units	72 (51.4%)	11 (100%)	83 (55%)
Number of Non-Working Units	68 (48.6%)	0	68 (45%)
Total	140 (100%)	11 (100%)	151 (100%)

8. Availability of Mics/Microphones

As indicated in the Table 16, only a single private school (11.1%) has reported the availability of one mic/microphone in computer lab/s. Furthermore, the Table 17 reveals that this mic/microphone unit is in working condition.

Table 16: Availability of Mics/Microphones in the Computer Lab/s

Number of Mics/Microphones	Number of Schools		
	Government School	Private School	Total
0	9 (100%)	8 (88.9%)	17 (94.4%)
1	0	1 (11.1%)	1 (5.6%)
Total	9 (100%)	9 (100%)	18 (100%)

Table 17: Number of Working and Non-Working Units of Mics/Microphones

Mics/ Microphones			
	Government School	Private School	Total
Number of Working Units	0	1 (100%)	1 (100%)
Number of Non-Working Units	0	0	0
Total	0	1 (100%)	1 (100%)

9. Internet Connectivity in Computer Lab/s

Table 18 presents that among all the 18 rural-area secondary schools taken for the study, 83.3% schools have affirmed the availability of internet in their computer lab/s. Further, all the government schools (100%) are enabled with the facility of internet in their computer lab/s whereas the percentage of private schools regarding this has been noted only 66.7%.

Table 18: Availability of Internet in Computer Lab/s

Availability of Internet	Number of Schools		
	Government School	Private School	Total
Yes	9 (100%)	6 (66.7%)	15 (83.3%)
No	0	3 (33.3%)	3 (16.7%)
Total	9 (100%)	9 (100%)	18 (100%)

On observing the Table 19, it is found that out of the 15 schools affirming the availability of internet in the computer lab/s, nearly 86.7% schools have reported the regular as well as high speed of internet connectivity in their computer lab/s whereas 100% private schools have confirmed the regular and high speed of internet connectivity in computer lab/s as compared to 77.8% government counter

parts. So private schools have been observed to be 22.2% ahead in providing the regular and high speed of internet connectivity in computer lab/s than government schools.

Table 19: Regular and High Speed of Internet Connectivity in Computer Lab/s

Regular and High Speed of Internet Connectivity	Number of Schools		
	Government School	Private School	Total
Yes	7 (77.8%)	6 (100%)	13 (86.7%)
No	2 (22.2%)	0	2 (13.3%)
Total	9 (100%)	6 (100%)	15 (100%)

CONCLUSION

From the findings of the study, it is concluded that most of the schools have sufficient number of computers/laptops in computer lab/s. The private schools are well ahead of the government schools with respect to the availability and maintenance of computers, invertors/UPSs and speakers in the computer lab/s. Even though, government schools are better placed regarding the availability of printers and headphones in computer lab/s, but are lagging behind in working condition. Availability of projectors, scanners and mics/microphones is very poor in computer lab/s of the sampled schools. Further, the percentage of government schools is higher than private ones for providing the internet facility in computer lab/s, but private schools have an upper hand regarding the regular and high speed of internet connectivity in computer lab/s.

RECOMMENDATIONS

1. Number of computers and other related ICT devices in computer lab/s of different schools should be adequate as per the need for the better outcomes.
2. More stress should be given upon the maintenance of ICT devices available in computer labs, mainly in government schools.
3. All the schools should need to provide the internet facility in computer lab/s with regular and high speed of internet connectivity.

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