



Correlates of Socio Demographic Factors with Utilization of ICT Gadgets by Rural Students

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Aims: This study investigates the utilization of ICT gadgets by rural students, focusing on usage patterns and their correlation with socio-demographic factors. As the demand and usage of ICT is increased, it is necessary to identify the ICT gadgets used by rural students and their extent of utilization so they may not be lag behind as urban population increasing the digital divide.

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Study Design: The research design was descriptive correlational research in nature. Research targeted two government senior secondary schools, one each from the villages of Niyana and Bhiwani Rohilla. A total of 100 students from grades 9 to 12 participated in the study who were willing and interested to participate.

Place and Duration of the Study: The study was conducted in the Hisar district of Haryana state. The collection of data was done through the self-constructed questionnaire in the month of May, 2022 by the researcher itself. Duration of the study was 6 months.

Methodology: Utilization was the usage of the ICT gadgets to reveal which types of ICT gadgets were being utilized by the respondents and which were not utilized. The developed questionnaire was used to discover the most utilized ICT gadgets by the respondents. For calculating, Level of Utilization of ICT gadgets, an excel sheet was made with the responses of the students given on the self-developed questionnaire on the usage of number of gadgets (0-15). For Comparison of School-I and School-II, Significance of the Difference was used. Correlation between Socio-Demographic profile of the respondents and utilization of ICT gadgets by School-I and School-II was also analyzed with $P=.05$.

Results: It was revealed that all students in School-I utilized smartphones and televisions, with most displaying a medium level of usage. In contrast, students in School-II exhibited a lower level of ICT gadget utilization, despite similar access to smartphones and televisions. The t-score analysis revealed a significant difference in usage levels between the two schools.

Smartphones were the most utilized devices for a variety of purposes, including academics, entertainment, and online transactions, while laptops were the least used gadgets. The study also found a positive correlation between education level and ICT gadget usage, suggesting that students with higher education engage more with ICT tools. A negative correlation was observed between distance from urban centers and ICT usage, indicating that students farther from cities face greater challenges in accessing technology. The results of the research will be beneficial for government and policymakers to formulate programs to enhance the utilization of ICT gadgets by rural students of India to overcome digital gap.

Conclusion: These findings emphasize the influence of socio-demographic factors on ICT usage and highlight the need for targeted interventions to enhance technology access and utilization in rural education.

Keywords: Utilization; ICT gadgets; correlation; Haryana; rural students.

1. INTRODUCTION

The rising utilization of ICTs has revolutionized the teaching-learning process. It is commonly accepted that ICTs play a powerful and supportive role in empowering teachers and learners (Ghavifekr et al., 2017). Information and Communication Technology (ICT) has become a vital component of modern education systems globally. ICT constitutes a broad array of digital tools and resources, including computers, tablets, interactive whiteboards, educational software, and internet-based learning platforms. These technologies are being integrated into classrooms and curricula to enhance teaching methods, improve student engagement and motivation, and prepare young students for the digital age (Nae 2024). As COVID pandemic has sped up the utilization of technology in education. In the time of Covid'19 pandemic (2020-21), students have endured a great deal in their scholastic interest and abilities as there was a major shift to digitalization in the field of

education. The demand and usage of ICT services at school level (for both teacher and students) was highly increased. But as digitalization highly impact the future of education and learning, more refinements in the usage of ICT technology and services are required for many of us are facing many challenges during accessing ICT services and working with them (Sharma, 2021).

The utilization of ICT in education sector has facilitated the streamlining of instructional processes, thereby fostering national stability and economic sustainability (Hamza et al., 2024). The concept of ICT integration in education is at hype after the global pandemic due to the fact that students are becoming more familiar with the technology and they could learn better within the technology-based environment. Due to this and students' learning achievement has attracted increasing attention from researchers and policy makers. Results of the study by Chain et al. 2023 indicated that ICT

utilization had a significant positive effect on learning achievement, and digital literacy played a mediating role in the relationship between them.

The issue of ICT integration in schools, specifically in the classroom is vital because, the use of technology in education contributes a lot in the pedagogical aspects in which the application of ICT will lead to effective learning with the help and supports from ICT elements and components (Jamieson-Procter et al., 2013). It is right to say that almost all ranges of subjects' start from mathematics, science, languages, arts and humanistic and other major fields could be learned more effectively through technology-based tools and equipment's. In addition, ICT provides the help and complementary supports for both teachers and students where it involves effective learning with the help of the computers to serve the purpose of learning aids (Jorge et al., 2003). ICT helps the students to acquire the skills necessary for effective utilization. Oyewole and Salami 2024 discovered that Information and Communication Technology (ICT) has significantly impacted education, with the curriculum now emphasizing the acquisition of skills necessary to effectively address societal issues. Also the need for ICT based learning media must be addressed seriously as it is sustainable with the orientation of the SDGs (Sustainable Development Goals) in education, namely Goal 4: Quality education - Ensure appropriate and inclusive quality education and encourage lifelong learning opportunities for all people, and promote education for sustainable development.

Based on the results derived by Chodijah et al., 2024, the utilization of learning media based on information and communication technology (ICT) fosters the active role of students in working on learning. They concluded that using ICT-based learning media could lead the students to optimize their learning outcome, skills through differentiated learning pertaining to SDGs. Emmanuel and Anele 2018 examined Utilization of ICT by Postgraduate Students in Ignatius Ajuru University, Rivers State, Nigeria. It was discovered that there are ICT facilities available for postgraduate students; they use ICT facilities to a high extent.

Fabunmi and Adesoji (2011) found that 85.0 per cent students were utilizing mobile phones were highly cognizant with ICT tools which led to the conclusion that students utilized ICT tools daily.

The mobile phone was used as an ICT tool by 90.0 per cent of students. Bello et al. (2017) revealed that 93.30 per cent of the students used computers or laptops followed by 91.50 per cent of the respondents who used tablets and 61.70 per cent used smart phones with internet access. Kadam et al. (2018) revealed that 26.0 per cent respondents utilized ICTs for playing web-based games watching films while 18.8 per cent for long-range interpersonal communication and 17.20 per cent for utilizing mail. Chatterjee et al. (2020) concluded that when girl students of school level in rural India would use mobile technology, it will also improve the standard of education in their house and would fetch appreciable development in the school education. The field of ICT also demands funds to be provided to met the increasing need of the students and young minds. The study by Hamza et al., 2024 recommended that the Government should ensure adequate funding to provide ICT resources in senior secondary schools as contained in the national policy on education.

The principal objective of this research paper is to examine the utilization of various ICT gadgets by the rural students. It also investigates the level of utilization by the respondents i.e. Low, Medium and High. Another objective of this paper is to discover the purpose for the utilization of ICT gadgets and the correlation between the utilization of ICT gadgets and socio-demographic profile of the students.

2. METHODOLOGY

The current study was conducted in the Haryana state. One district from Haryana state i.e. Hisar was selected randomly. The research targeted two government senior secondary schools, one each from the villages of Niyana and Bhiwani Rohilla. A total of 100 students from grades 9 to 12 participated in the study who were willing and interested to participate. The collection of data was done through the developed questionnaire from 1 May, 2022 to 30 May, 2022 by the researcher itself.

Utilization in the study was referred as the usage of the ICT gadgets to reveal which types of gadgets were being utilized by the respondents and which were not utilized. Also, to discover the most utilized ICT gadgets by the respondents. The responses for the utilization of gadgets were taken in 'Yes' and 'No' with the weightage of 1 and 0 respectively on the self-developed questionnaire by the researcher. Each gadget

was given a score 1, if the respondent was utilizing the certain gadget and score 0 was given if the respondent was not utilizing that gadgets. By this scoring method, Tables 2 and 4 was calculated.

For calculating, Level of Utilization of ICT gadgets (Tables 1, 3 and 5), an excel sheet was made with the responses of the students on the usage of number of gadgets (0-15). Then, their level of utilization was categorized as low, medium and High. Maximum score one could obtain was 15 and minimum could be 0 for the fifteen gadgets. Low level of utilization means, students were utilizing 0-5 ICT gadgets and same method was used for medium and high level of utilization. On this basis, the respondents were categorized into three utilization levels.

Table 1. Scoring for calculating the Level of Utilization of ICT gadgets

Level of Utilization	Score range
Low	0 – 5
Medium	6 – 10
High	11– 15

For Comparison of School-I and School-II, Significance of the Difference was used. The

difference between the means of both the schools was calculated by t-test (A t- test is an inferential statistical test that was used to compare the means of two groups to determine if there was a significant difference between the mean of two groups. Higher value of t-test indicate that a significant difference exist between the two samples).

Correlation between Socio-Demographic profile of the respondents and utilization of ICT gadgets by School-I and School-II was also analyzed with P=.05. Various demographic factors were analyzed like Age, Gender, Education, Ordinal position, Family size, Family type, Occupation of family, Family income, Hours of power supply and Distance from city or town (Table 8).

Utilization of ICT gadgets for different purposes by the School-I and School-II students was calculated by the frequency method by combining both the school students i.e. n=100 (Table 7).

*Note: School-I: Aarohi Model Senior Secondary School, Bhiwani Rohilla.
School-II: Government Senior Secondary school, Niyana*

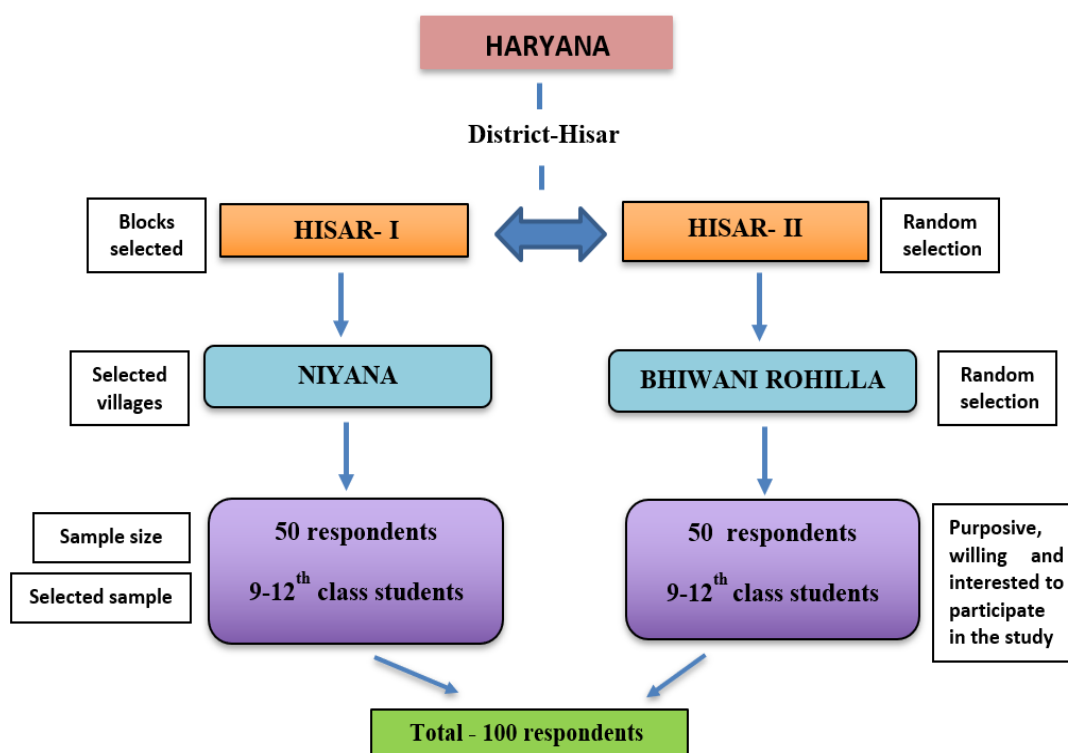


Fig. 1. Selection of the target students for the study

3. RESULTS AND DISCUSSION

3.1 Utilization of ICT Gadgets by Respondents of School-I

Data in the Table 2 depicts the ICT gadgets being utilized by rural students of School-I (Aarohi Model Senior Secondary School). The data further indicated that cent per cent students were utilizing television and smart phones. Around three-quarter respondents were utilizing computer, laptop and tablet with (78.0%, 74.0% and 72.0%) each respectively. Memory card were being utilized by 68.0 per cent respondents followed by pen drive (48.0 %) whereas LCD projector was being utilized by 40.0 per cent respondents. Less than one quarter population (24.0% and 22.0%) were using modem/router/Wi-Fi and printer each respectively. Smart bands were being utilized by 20.0 per cent respondents followed by scanner (14.0%). Only (4.0% and 6.0%) respondents were utilizing iPad and radio each respectively.

3.2 Level of Utilization of ICT Gadgets Among Rural Students of School-I

Annotating the data given in the Table 3, the overall level of Utilization of ICT gadgets among rural students for School-I was found to had medium (56.0%) level of utilization followed by 32.0 per cent had low level of utilization and only 12.0 per cent had high level of utilization of ICT

gadgets. This implies, out of 50 students, 56.9 percent were utilizing 6-10 gadgets, 32.0 percent were utilizing 0-5 gadgets and only 12.0 percent were utilizing 11-15 gadgets.

3.3 Utilization of ICT Gadgets by Respondents of School-II

Data in the Table 4 revealed that majority of the respondents were utilizing smart phones (94.0 %), television (92.0%) and tablet (60.0%). Less than half of the respondents were utilizing memory card (48.0%), computers (46.0%) followed by pen drive (36.0%), laptop (24.0%), radio (18.0%) and modems/routers/wi-fi by 16.0 per cent each respectively and printer by 14.0 per cent. A small per cent of the respondents were utilizing scanner and smart band (6.0% and 4.0%) each respectively.

3.4 Level of Utilization of ICT Gadgets Among rural Students of School-II

Table 5 showed the overall level of utilization of ICT gadgets among respondents of School-II. It was found that majority of the respondents (74.0%) had low level of utilization followed by 22.0 per cent having medium level of utilization and only 4.0 per cent had high level of utilization of ICT gadgets. This implies, out of 50 students, 74.0 percent were utilizing 0-5 gadgets, 22.0 percent were utilizing 6-10 gadgets and only 2.0 percent were utilizing 11-15 gadgets.

Table 2. ICT gadgets being utilized by respondents of School-I

Sr. No.	ICT gadgets	School-I (n=50)		Mean Score
		Response (%)		
		f	%	
1.	Computer	39	78.0	0.78
2.	Laptop	37	74.0	0.74
3.	Tablet	36	72.0	0.72
4.	LCD Projector	20	40.0	0.40
5.	iPad	2	4.0	0.04
6.	Smart phones	50	100.0	1.00
7.	Landline phones	-	-	-
8.	Television	50	100.0	0.50
9.	Radio	3	6.0	0.12
10.	Printer	11	22.0	0.22
11.	Scanner	7	14.0	0.14
12.	Pen drive	24	48.0	0.48
13.	Memory card	34	68.0	0.68
14.	Modems/ routers /Wi-Fi	12	24.0	0.24
15.	Smart band	10	20.0	0.20

Table 3. Level of utilization of ICT gadgets among rural students of School-I

Sr. No.	Categories	School-I (n=50)	
		f	(%)
1.	Low (0-5)	16	32.0
2.	Medium (6-10)	28	56.0
3.	High (11-15)	6	12.0

Table 4. ICT gadgets being utilized by respondents of School-II

Sr. No.	ICT gadgets	School-II (n=50)		Mean score
		Response (%)		
		f	%	
1.	Computer	23	46.0	0.46
2.	Laptop	12	24.0	0.24
3.	Tablet	30	60.0	0.60
4.	LCD Projector	8	16.0	0.16
5.	iPad	0	0.0	0.00
6.	Smart phones	47	94.0	0.94
7.	Landline phones	0	0.0	0.00
8.	Television	46	92.0	0.92
9.	Radio	9	18.0	0.18
10.	Printer	7	14.0	0.14
11.	Scanner	3	06.0	0.06
12.	Pen drive	18	36.0	0.36
13.	Memory card	24	48.0	0.48
14.	Wi-Fi	8	16.0	0.16
15.	Smart band	2	4.0	0.04

Table 5. Level of utilization of ICT gadgets among rural school of School-II

Sr. no	Categories	School-II (n=50)	
		f	(%)
1.	Low (0-5)	37	74.0
2.	Medium (6-10)	11	22.0
3.	High (11-15)	2	4.0

Table 6. Comparison of School-I and School-II for utilization of ICT gadgets (N=100)

Variable	School-I (Mean ± SD)	School-II (Mean ± SD)	't' value
Utilization	0.41 ± 0.31	0.32 ± 0.31	2.21*

*Significant at p = .05 level of significance

Table 7. Utilization of ICT gadgets for different purposes by the respondents of School-I and School-II

S. no.	Purposes	Usage of ICT Tools			N=100
		Mobile	Laptop	Tablet	Television
1.	Academics	100	10	40	5
2.	Entertainment	100	13	50	98
3.	Varied Bookings	68	3	10	-
4.	Photography & Videography	90	-	3	-
5.	Online Shopping	60	4	15	-
6.	Communication /calling	100	-	27	-
7.	Cashless transaction	64	-	-	-
8.	Gaming	94	7	32	-
9.	Form filling	34	4	12	-
10.	News updates	35	-	6	67
	Mean value	74.50	6.83	21.66	56.66

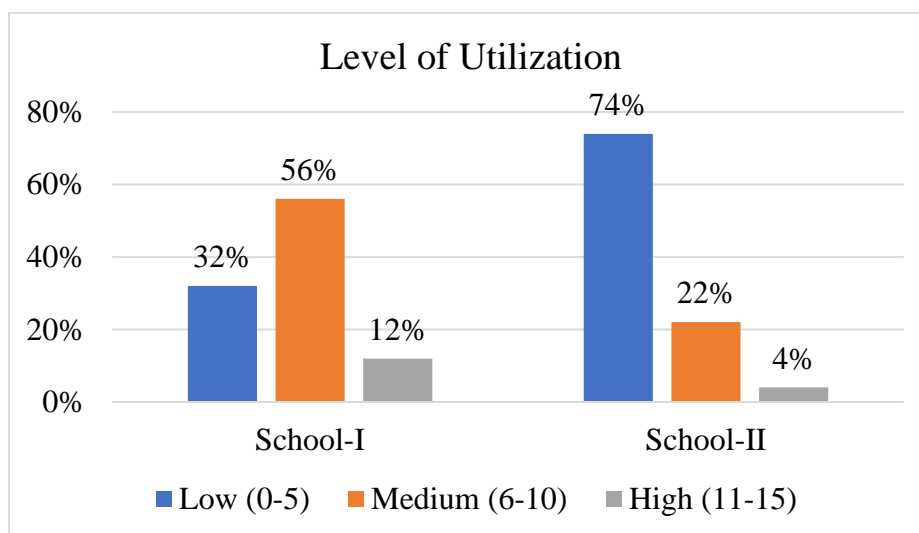


Fig. 2. Level of utilization of ICT gadgets among students of School-I and School-II

Table 8. Correlation between socio-demographic profile and utilization of ICT gadgets by the respondents of School-I and School-II N=100

S. No.	Variables	Correlation with utilization	
		School-I	School-II
1.	Age	0.19	0.14
2.	Gender	-0.24	0.17
3.	Education	0.41*	0.32*
4.	Ordinal position	-0.22	0.08
5.	Family size	-0.012	0.13
6.	Family type	0.028	0.24
7.	Occupation of family	0.35	0.16
9.	Family income	0.13	0.11
10.	Hours of power supply	0.03	0.23
11.	Distance from city or town	-0.31*	-0.29*

*Significant at $p=.05$ level of significance

3.5 Comparison of School-I and School-II for Utilization of ICT Gadgets

Data in the Table 6 depicted the comparison among the respondents of School-I and School-II for utilization of ICT gadgets. In order to compare the utilization, t-test was applied and t-score value was calculated. The t-score value was 2.21* which indicated the significant difference for the utilization of ICT gadgets among respondents of School-I and School-II.

3.6 Utilization of ICT Gadgets for Different Purpose by the Respondents

Table 7 inferred that smart phones was utilized by majority of the rural students of both the schools for performing variety of tasks like academics, entertainment, online shopping,

photography, calling, booking, cashless transaction, gaming, form filling and news update with highest mean value of 74.50 followed by utilization of television by most of the students with the mean value of 56.66, tablet with mean value of 21.66 for various purposes like academics, entertainment, varied bookings, photography and videography, online shopping, communication, gaming, form filling and news updates. With mean value of 6.83, laptop was least used gadget by the respondents of both the schools for multiple purposes.

3.7 Correlation between Socio-Demographic Profile of the Respondents and Utilization of ICT Gadgets by School-I and School-II

Annotating the data in the Table 8, there was significantly positive correlation of education with

utilization of ICT gadgets ($r=0.41^*$ and $r=0.32^*$) in School-I and School-II respectively which means as the education increased utilization of ICT gadgets among respondents also increased.

There was significantly negative correlation of distance from city or town with utilization of ICT gadgets ($r= -0.31^*$ and $r= -0.29^*$) in School-I and School-II respectively which means as the distance from city or town increased utilization of ICT gadgets among respondents decreased.

4. CONCLUSION

This study investigates the utilization of ICT gadgets by rural students, focusing on usage patterns and their correlation with socio-demographic factors. As the demand and usage of ICT is increased, it is necessary to identify the ICT gadgets used by rural students and their extent of utilization so they may not be lag behind as urban population increasing the digital divide. The study reveals significant insights into their usage patterns and the correlation with socio-demographic factors. In School-I, all students utilized smartphones and televisions, with the majority showing a medium level of usage. Conversely, in School-II, although smartphones and televisions were widely used, most students exhibited a low level of ICT utilization. The t-score analysis confirmed a significant difference in ICT gadget usage between the two schools.

Smartphones emerged as the most utilized device across both schools for a range of activities, from academic purposes to entertainment, online shopping, and even cashless transactions. However, laptops remained the least used ICT gadget, reflecting the limited access or preference for other devices in these rural settings. Moreover, the study identified a significantly positive correlation between education level and ICT usage, indicating that higher educational attainment encourages greater engagement with ICT tools. On the other hand, there was a significantly negative correlation between the distance from urban centres and ICT usage, suggesting that students located farther from cities or towns face challenges in accessing and utilizing these technologies.

These findings highlight the critical role of socio-demographic factors in influencing ICT usage among rural students and underscore the need for targeted interventions to improve access to and effective utilization of technology in rural

education systems. Based on the research, future study could focus on investigating how ICT gadget usage affects students' academic outcomes, distinguishing between academic and non-academic usage to assess their influence on educational achievements and explore how varying levels of internet access in rural areas influence the utilization and effectiveness of ICT gadgets, especially in remote locations.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that generative AI technologies such as Large Language Models, etc. have been used during the writing or editing of manuscripts. This explanation will include the name, version, model, and source of the generative AI technology and as well as all input prompts provided to the generative AI technology.

Details of the AI usage are given below:

1. Chat GPT (<https://chatgpt.com/>)
2. Perplexity.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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