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Gender Disparities in the Use of ICT: A Survey of Students in Urban Schools

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ABSTRACT
This study aims to investigate gender differences in the use of ICT by the students of urban schools. The objectives of the study are to find out the use of computers and Internet by the students and also the problems encountered by them while using computers and Internet. The study found that there is a significant association between the place (p=.005) and frequency (p=.002) of use of computers and gender. It is also found that there are significant differences in the problems faced by students while using computers (p=.002), use of Internet (p=.004), and the gender. This clearly indicates that there exists a gender disparity in the use of ICT by the male and female students in the urban schools. In order to overcome this disparity, the school authority should provide the basic and necessary ICT infrastructure in schools which can be equally used by male and female students.

Keywords: ICT, gender disparities, students, urban schools

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1. INTRODUCTION

In India, despite improvements in educational access over the past several decades, social background is still found to be associated with learning outcomes. Achievement gaps based on gender, region, and other social background factors often arise in primary school, and many Indian children struggle against historical inequalities such as those based on gender and caste (Desai et al., 2010).

Indian girls may experience lower quality school environments than boys do. In particular, girls are enrolled in private schools at somewhat lower rates than boys and are less engaged with private tutoring. Together these factors contribute to higher overall education expenditures for boys than for girls, even with the existence of special fee reduction policies for girls in some areas (Desai et al., 2010). The issue of gender justice as far as access to and use of ICT (Information Communication Technology) continues to be a topical subject not only for India but the world over.

According to a 2011 census, the female literacy rate was 65.46% compared to 82.14% for males. This gap indicates a wide gender disparity in India and that Indians do not give enough importance to the education of girls. Educating a female child is still seen as a bad investment because she is bound to get married and leave her paternal home one day (Gender inequality in India, 2017). The underlying thought that educating women is of no value as they will only serve their husbands and family in future makes parents unwilling to spend on girls' education. A good education or qualification does not bring women up to par with men. Thus without having a good education women are found lacking in the present day's challenging job skills. They are still destitute of many work opportunities as men are believed to be more capable than their female counterparts with similar qualifications

While in a few contexts, gender plays a significant role in determining the intention of accepting new technology, there are cases where gender differences cannot be discerned. In the context of usage of Information Technology, which includes computers, email services, electronic data management systems, etc., gender acts as an influencing factor in technology adoption as men are claimed to be more technologically adept compared to women (Goswami & Dutta, 2016).

The increasing use of ICT along with new skills and competencies in education among students are required for effective learning. As an educational and entertainment tool, ICT can enable students to learn virtually on any topic. Gender inequality in school education is a persistent problem in Indian society. During the past several decades, India has achieved success in moving towards universal school enrollment and in enacting policies to address educational inequalities based on gender. However, education gaps still exist (Teck & Lai, 2011).

Keeping in view the importance of ICT in school education, the present study has been undertaken to know the use of ICT by male and female students in urban schools. It also tries to know the disparities in the use of ICT by male and female students.

2. RELATED LITERATURE

Significant studies have been carried out during previous years on various aspects about the use of computers and the Internet by male and female students to identify gender disparities. In India, Mishra et al. (2005) identified the gender gap in their study and found that 61.5% of males and 51.6% of females used the Internet, and 83.1% of males and 61.3% of females faced the problem of slow Internet connections. In the year 2007, Li and Kirkup concluded that men tend to use email and "chat" rooms more than women do, men play more games on computers, and men are more confident in their computer skills than women are. However, the gender inequality is stronger in the British group than in the Chinese one. Similarly, Afonso et al. (2012) studied 2,175 users of the Electronic Document Management System (EDMS) and found that gender only moderates performance expectancy towards behavioral intention, as males are argued to be more result oriented than females.

Calvert et al. (2005) had interviewed 1,065 parents to know about the media habits of children aged 6 months to 6 years in the U.S., and found that at younger ages there was no difference between boys and girls in using computers but, however, the interest level of the girls diminished at later stages. Ono and Zavodny (2005) conducted a comparative study in the USA and Japan and they revealed that during the 1990s there were radical gender gaps in both the countries in In-

formation Technology usage but the situation had reversed by 2001 in the U.S., while in Japan the situation remained unchanged. In the context of implementing technological revolution, Mazman et al. (2009) indicated that females are more induced to adopt technological innovation through social influence rather than by a personal decision whereas in the case of males the personal decision to adopt innovation is much stronger than social influence.

Khan and Ghadially (2010) collected the data from 155 young Muslim women and men studying in three computer training centers in Mumbai, and a gender-based comparison was conducted. Data for computer ownership and home Internet connections were low for the entire sample, and the training centers and cybercafés were important points of access for females and males, respectively. In terms of perceived empowerment, young women reported higher gains than men did from computer learning when combined with ICT use. Thus, despite the existence of a gender-based digital divide, when bridged, ICTs showed potential as an equalizing force between the genders. In light of the above, policy measures to widen access and provide subsidized training are suggested.

Best and Maier (2007) explored how women use and perceive information technology in five villages in rural Tamil Nadu, India. They analysed the outcomes from structured in-depth interviews with 17 female Internet kiosk users and 22 women who had never used the Internet. They identified several critical issues, such as: There are gender-specific usage patterns and perceptions of ICTs; obstacles to ICT use are generally structural (time, location, illiteracy) and not personal; and manifestations of gender awareness correlate with perceptions of obstacles to ICT use.

Thus, after reviewing the literature, it was noted that there were no comprehensive and in-depth studies on computer literacy competencies among male and female students. With this background information, the present study has been undertaken to understand ICT competencies and to identify the gender gap.

3. OBJECTIVES OF THE STUDY

The present study is an attempt to elicit answers to the following research questions:

- What is the frequency and purpose of use of computers and Internet by male and female students?
- What problems have students encountered while using computers and Internet?
- How have male and female students learned the various computer applications?
- What is the impact of computers and Internet on studies of male and female students?

4. HYPOTHESES OF THE STUDY

The following hypotheses were formulated and tested with the data using the Chi-square analysis:

- There is an association between the use of computers and the gender of the respondents.
- The students' gender affects the place and frequency of use of computers.
- The problems faced in the use of computers differ among male and female students.
- The use of Internet varies among male and female students.

5. SCOPE AND METHODOLOGY

There are 157 urban high schools in Shivamogga District, Karnataka state (Directorate of Secondary Education, 2015). Of the 157 high schools, the study selected only 15 private high schools (Non-Government) from which a total of 300 students studying in 10^{th} standard are selected. Equal numbers of male and female students are selected from all 15 schools. Since it is a time-bound study, the researcher adopted convenience sampling to select the required sample. The time-bound study is constrained by hard deadlines in which the timings of the delivery are as important as the delivery itself. Therefore, the schools which are very much accessible to the research scholar are only considered for the study purpose. In each school, only 20 students are selected based on their interest to participate in the survey. Therefore, the sample size of the study is only 300 students (20 students x 15 schools).

The questionnaire has been designed to fulfill the stated objectives. Questions were asked to capture the data on demographic information, use of computers and Internet, reasons for not using the Internet, and

also to know the impact of computers and Internet on the academic performance of male and female students. The questionnaires were distributed to the selected population in each school and the duly filled questionnaires were analyzed using Statistical Package for Social Sciences (SPSS version 21.0) and the data have been presented in the form of tables and charts.

The main objective of the study was to know the use of computers among the male and female students of urban schools. In this context, a question was included in the questionnaire to know the use of computers by male and female students. The data presented in Table 1 indicate that the majority (91.33%) of students used computers and only 8.66% of students are not using computers. Further, the gender wise use of computers shows that 92% of males and 90.66% of females used computers for their academic work. The Chi-square analysis indicates that there is no association between the use of computers and the gender. This shows that an equal percent of male and female students of urban schools used computers for various academic work and thus hypothesis 1 has been rejected.

The place of use of computers by students is presented in Table 2. It reveals that a majority of male (94.20%) and female (78.67%) students used computers at schools followed by home (46.37% - male and 25.73% - female) and a neighbor's / friend's home (31.88% - male and 18.38% - female). Only 37.48% of male and 17.64% of female students used computers at computer coaching centers. Further, it is found that 54.34% of male students used computers at cybercafés compared to females (16.91%). The Chi-square analysis indicates that there is an association between the place of use of computers and gender (X^2=14.947, df=4, p=.005). This shows that male students have more freedom to use the computer either at home, a neighbor's / friend's home, or even at a cybercafé as compared to their counterparts, whereas the female students have much less freedom to use computers at cybercafés or at a neighbor's / friend's home, which has been substantiated by the Chi-square analysis (p<.005). Therefore hypothesis 2 has been accepted.

The study also made an attempt to know the frequency of use of computers. The data related to frequency of use of computers is presented in Table 3, which indicates that 54.74% of respondents used computers every day. The gender wise use of computers shows that 66.66% of males and only 42.64% of females used computers every day. A very few male students (10.14%) and female students (04.41%) used computers once in a week. The above data indicate that there is a clear disparity between male and female students with respect to the frequency of use of computers. This clearly shows that

Table 1. Use of Computers

Respondents	Yes	No
Male (N=150)	138 (92.00)	12 (8.00)
Female (N=150)	136 (90.66)	14 (9.33)
Total (N = 300)	274 (91.33)	26 (8.66)

Table 2. Place of Use of Computers

Respondents	School	Home	Neighbor's / friend's home	Computer coaching centers	Cyber café
Male (N=138)	130 (94.20)	64 (46.37)	44 (31.88)	48 (37.48)	75 (54.34)
Female (N=136)	107 (78.67)	35 (25.73)	25 (18.38)	24 (17.64)	23 (16.91)
Total (N = 274)	237 (86.49)	99 (36.13)	69 (25.18)	72 (26.27)	98 (35.76)

in India female students may not have more freedom to use ICT and its applications as compared to males. Further, the Chi-square test has been applied to know the association between the frequency of use of computers and gender. Not surprisingly, the Chi-square analysis also supported the data (X^2=12.557, df=2, p=.005) and hence the second hypothesis (2) has been accepted.

Students were requested to mention the purpose of use of computers and the data are presented in Table 4. It is very interesting to note that a majority of male (94.20%) and female (80.88%) students used computers for playing games, followed by project work (79.71% - male and 58.08% - female); while 66.49% of males and 36.02% of females used computers to access Internet and only 18.84% of males and 8.08% of females used computers to see exam results.

Respondents were asked to mention the methods of learning to use computers and the responses are presented in Table 5. The gender wise methods of learning to use computers shows that the majority (92.72%) of male and 85.29% of female respondents learned to use computers with the help of teachers, followed by the trial and error method (71.01% - male and 46.32% - female) and with the help of parents (43.47% - male and 23.52% - female). Only 10.93% of male and 5.14% of female students learned to use computers by reading computer books. The data clearly show that gender has an impact on the methods of learning to use a computer and its applications.

Students were also asked to mention the various

Table 3. Frequency of Use of Computers

Respondents	Frequency		
	Everyday	2-3 days in a week	Once in a week
Male (N=138)	92 (66.66)	52 (37.68)	14 (10.14)
Female (N=136)	58 (42.64)	72 (52.94)	06 (04.41)
Total (N=274)	150 (54.74)	124 (45.25)	20 (07.29)

Table 4. Purpose of Use of Computers

Purpose	Gender	
	Male (N=138)	Female (N=136)
Class assignment	70 (52.89)	59 (43.38)
Project work	110 (79.71)	79 (58.08)
To use Internet	89 (66.49)	49 (36.02)
See exam result	26 (18.84)	11 (08.08)
Play computer games	130 (94.20)	110 (80.88)
Watch international games (cricket, football, tennis, etc.)	56 (40.57)	08 (05.88)
Watch animation movies	68 (49.27)	30 (22.05)
See animal images	37 (26.81)	17 (12.50)
Watch cartoons	55 (39.85)	23 (16.91)

Table 5. Methods of Learning Computers

Methods	Gender	
	Male (N=138)	Female (N=136)
Self-taught	23 (16.66)	11 (08.08)
Trial and error method	98 (71.01)	63 (46.32)
With the help of teachers	128 (92.72)	116 (85.29)
With the help of parents	60 (43.47)	32 (23.52)
Guidance from friends	15 (11.71)	05 (03.67)
By reading computer books	14 (10.93)	07 (05.14)

computer applications used by them for their academic work (Table 6). It is surprising to note that both males (100%) and females (100%) used Paint Brush. Further, the majority of male (92.75%) and female (77.94%) students used MS Word, followed by MS Excel (83.33% - male and 53.67% - female) and MS PowerPoint (74.63% - male and 72.05% - female). Very few percent of male (2.89%) and female students (1.47%) used C programming.

The study intended to identify the various problems faced by both male and female students in the use of computers. The data presented in Table 7 indicate that both male and female students faced various problems in the use of computers. Frequent electric power failure is the major problem faced by both groups of students (86.95% - male and 58.82% - female). The other major problems faced by students are: inadequate computers at school (55.79% - male and 38.97% - female); and lack of inadequate computer skills (26.08% - male and 19.11% - female). Only 11.59% of males and 6.66% of females reported that there is no support from teachers to learn computer applications.

The data presented in the table clearly indicate that the problems faced by male and female students are different, which is also supported by the Chi-Square analysis (X^2=16.991, df= 4, p=.002), and thus there is an association between the problems faced in the use of computers and gender. Therefore, hypothesis 3 has been accepted.

The study also tried to know the use of Internet among male and female students in urban schools. Thus a question was included in the questionnaire to know the prompt responses of students with respect to the use of Internet. The gender wise analysis shows that 64.49% of male and 47.05% of female students used the Internet while only 35.50% of male students have not used the Internet (Table 8). But the percentage of non-Internet users are female students which accounted for 52.94%. In order to know the association between the use of Internet and gender, the Chi-Square analysis is performed. The result indicates that there is a significant association between gender and use of the Internet (X^2= 8.443, df=1, p=.004). It is noticed that a comparatively greater number of male students used the Internet than females did and hence hypothesis 4 has been accepted.

The place of use of Internet by students is presented in Table 9. It reveals that 70.03% of male and 40.62% of female students used the Internet at cybercafés. This clearly indicates that cybercafés are the most preferred places to use the Internet. A notable finding of the study is that a comparatively greater number of male students used the Internet than their female counterparts did. The table also shows that few of them used the Internet at their respective schools (40.44% - male and 31.25% - female) and home (32.58% - male and 42.18% - female). Only 29.21% of male and 29.68% of female respondents used the Internet in their neighbors'/ friends' homes.

Sincere attempts were made to know the reasons for

Table 6. Use of Various Computer Applications

Computer Applications	Gender	
	Male (N=138)	Female (N=136)
MS-DOS	76 (55.07)	23 (16.91)
MS Word	128 (92.75)	106 (77.94)
MS Excel	115 (83.33)	73 (53.67)
MS PowerPoint	103 (74.63)	98 (72.05)
MS Access	13 (09.42)	04 (02.94)
Word Pad	89 (64.49)	43 (31.61)
Note Pad	75 (54.34)	33 (24.42)
Paint Brush	138 (100)	136 (100)
DBMS	06 (04.34)	02 (01.47)
C Programming	04 (02.89)	02 (01.47)
Tally	08 (05.79)	04 (02.94)

Table 7. Problems Faced in the Use of Computers

Problems	Gender	
	Male (N=138)	Female (N=136)
Electric power failure	120 (86.95)	80 (58.82)
Lack of adequate computer skills	36 (26.08)	26 (19.11)
Inadequate computers in school	77 (55.79)	53 (38.97)
Lack of support from teachers	16 (11.59)	09 (06.66)
Lack of support from parents	23 (16.66)	46 (33.82)

Table 8. Use of Internet

Respondents	Yes	No
Male (N=138)	89 (64.49)	49 (35.50)
Female (N=136)	64 (47.05)	72 (52.94)
Total (N=274)	153 (55.83)	121 (44.16)

Table 9. Place of Internet Use

Respondents	School	Home	Neighbor's /friend's home	Cybercafé
Male (N=89)	36 (40.44)	29 (32.58)	26 (29.21)	65 (70.03)
Female (N=64)	20 (31.25)	27 (42.18)	19 (29.68)	26 (40.62)
Total (N=153)	56 (36.60)	56 (36.60)	45 (29.41)	91 (59.47)

not using the Internet by both male and female students and the data are presented in Table 10. It is surprising to note that a majority of male students (87.75%) have not used the Internet because of lack of Internet facilities at their schools. But the percentage of female students not using computers because of lack of Internet facilities at their schools is comparatively low (54.16%). Further, because of lack of knowledge about the availability of information on the Internet (67.34%) and lack of training regarding Internet use, 51.02% of the male students have not used the Internet. It is very important to note that 86.11% of female students have not used the Internet mainly because of lack of support from parents. The result indicates that female students need more support from their parents to use the Internet for their academic work.

Students were requested to mention the impact of computers and Internet on their academic performance and data are presented in Table 11. A majority of male (90.57%) and female students (80.14%) reported that the use of computers and Internet has made an impact in developing self-confidence. A few of them also opined that the use of computers has improved their overall quality of life (69.56% - male and 56.56% - female). The students also mentioned that the use of ICT has enhanced student/teacher interaction (54.34% - male and 32.35% - female).

6. DISCUSSION AND CONCLUSION

The use of ICT has revolutionized the way and manner in which school students use information. This study has revealed the use of ICT by male and female students in urban schools. The findings of the study enlighten the use of computers and Internet by the students of urban schools. It is found that the majority of students used computers for their academic purposes which shows that the students have a positive attitude towards the use of ICT. Since the majority of students used computers at their respective schools, school authorities should increase the ICT facilities in the schools.

Apart from the schools, the majority of male students used computers at cybercafés and computer coaching centers as well as at home, as compared to their female counterparts. The data show that female students are not exposed to use of computers and Internet either at cybercafés or at home. This indicates that there is a gender difference in the place of use of computers. Therefore, parents should support their children to make use of computers and Internet services for their academic work.

With respect to the purpose of use of computers, both male and female students used computers for similar purposes. But, most of the male and female students showed their interest to play computer games. Therefore, teachers should divert their minds to make optimum use of computers for their academic purposes.

All of the students learned to use computers with the help of school teachers. This clearly indicates that the students are mainly dependent on the teachers to learn to use a computer and its applications. To support this result, Li and Ranieri (2013) also found that teachers have more positive influences on the student's ICT behavior. Therefore, teachers should be trained frequently and school management should send their teachers to attend ICT oriented workshops and seminars to acquire new ICT skills and competencies, and also they can

Table 10. Reasons For Not Using Internet

Reasons	Gender	
	Male (N=49)	Female (N=72)
Lack of Internet facilities	43 (87.75)	39 (54.16)
Lack of training regarding Internet use	25 (51.02)	13 (18.05)
Lack of knowledge about the availability of information on the Internet	33 (67.34)	31 (43.05)
Lack of support from teachers	13 (26.53)	08 (11.11)
Lack of support from parents	05 (10.20)	62 (86.11)
Lack of time	06 (12.24)	02 (02.77)

Table 11. Impact of Use of Computers and Internet on Studies of Urban Students

Impact factors	Male (N=138)	Female (N=136)
Improved comprehension of vocabulary	41 (29.71)	26 (19.11)
Developed self confidence	126 (90.57)	109 (80.14)
Helped in proper study habits	53 (38.40)	33 (24.26)
Developed expression power	46 (33.33)	28 (20.58)
Enhanced student/teacher interaction	75 (54.34)	44 (32.35)
Helped me to learn things more easily	80 (57.97)	55 (40.44)
Helped me do well in my study	44 (31.88)	36 (26.47)
Enhanced remedial instruction	22 (15.94)	17 (12.50)
Improved overall quality of life	96 (69.56)	77 (56.56)
Stimulated creativity	17 (12.31)	14 (10.29)
Helped me to organize work	35 (25.36)	26 (19.11)

teach these skills to the students.

The study also found that there is a significance difference in male and female students with respect to problems faced while using computers. Therefore, additional care should be taken to solve problems faced by female students while using computers. In this context, the study recommends that the school authority should enhance the ICT facilities equally for both male and female students. Additionally, more training should be given by teachers on the use of ICT to overcome the problems faced by female students.

It is also noticed that frequent power failure is a major problem faced by students in urban schools. Therefore, school management should provide Uninterrupted Power Supplies (UPS) in their schools. The majority of the students not using the Internet do so because of lack

of Internet facilities in schools and lack of knowledge about the availability of information on the Internet. There is a need to provide Internet facilities in urban schools and appoint a teacher to teach Internet based applications to the students.

The result of the study also shows that there is an association between gender and the non-use of Internet by the students of urban schools. For instance, 86.11% of female students opined that the lack of support from parents is one of the reasons for not using the Internet whereas this percentage is very low among male students (10.20%).

Based on the above discussion the study recommends that the school authority should provide basic infrastructure viz., well equipped computer labs, and separate cabins and separate timing hours to female students. It is also necessary to appoint a female teacher to teach computers and use of the Internet to female students, so that they may feel free to interact with the teachers in the teaching and learning process.

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