



USE OF INFORMATION AND COMMUNICATION TECHNOLOGY: GENDER DIFFERENCES AMONG STUDENTS AT TERTIARY LEVEL

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Abstract

This study was conducted to provide insights regarding the possible gender differences in the male and female students at tertiary level in term of information and communication technology use. The research was a descriptive in its nature. The objective of the study was to analyze the opportunities of access to Information and communication Technology (ICT) for male and female students at the university level. The population was the male and female students of the public sector universities of Pakistan. The purposive sampling technique was used to gather data from the faculty of social sciences of two public sector universities. Data were collected by administering a questionnaire based on a Likert- five point scale. The data were tabulated, analyzed and interpreted. The percentage, Chi Square and mean were applied to analyze the data. The results of the analyzed data revealed that gender differences existed regarding access to ICT among university students. Provision of necessary support for equal access to female students in ICTs through expansion of ICT infrastructure in the educational institutions particularly in universities, Computer Assisted Instructions (CAI) system and awareness about the use of ICTs is essential to overcome the identified gender inequality.

Key Words: Information and Communication Technology, Gender, Higher Education.

INTRODUCTION

The rapid developments in technology have caused significant changes in the way we live, as well as the demands of the society. Recognizing the impact of new technologies in the workplace and everyday life, today's teacher education institutions try to restructure their education programs and classroom facilities in order to minimize the teaching and learning technology gap between today and the future. This restructuring ongoing process requires effective integration of technologies into existing context in order to provide learners with knowledge of specific subject areas, to promote meaningful learning and to enhance professional productivity (Tomei, 2005).

Information and Communication technology (ICT) plays a critical role in information societies' educational systems. In these societies, the stakeholders of educational policy, redesign and reconstruct their educational systems based on new educational paradigms such as constructivist theory so that both teachers and students develop the necessary knowledge and skills sought required in this digital age. Hence, most countries around the world are focusing on approaches to integrate ICT in learning and teaching to improve the quality of education by emphasizing competencies such as critical thinking, decision-making, handling of dynamic situations, working as a member of a team, and effective communication (Anderson & Weert, 2002). The integration of ICT into education has been seen as the tool to help realize the potential of the new technological tools to revolutionize an outmoded educational system (Albrini, 2006). Pelgrum et al (1993) have noted that ICT is "not only the backbone of the Information Age, but also an important catalyst and tool for inducing educational reforms that change our students into productive knowledge workers".



Currently many researchers and scholars in education, particularly higher education carry out research and bracing themselves with knowledge on how to approach the attitudes and behaviours of the younger generation regarding usage of ICT. However, one essential aspect seems to be absent from the discourse ‘the possibility that young people do not behave, think and learn in the same manners; that we have a generation with many different competencies. Veen (2003) warns about the growing “net generation” – Homo sapiens – growing up using ICT in their early childhood could have more expectations of media components from their predecessors. The United Nations Organization also acknowledges the significance of gender perspectives in innovation of new technologies as stated: “In reviewing and developing policies and corresponding strategies and programs which encourage innovation, access and the development of advanced skills and channel new technologies towards the most urgent needs of the world’s poor people, it is critical to ensure that gender dimensions are equally addressed” (UNESCAP, 2002).

Purpose of the Study

The issue of the gender gap in Instructional Technology has caught the attention of many researchers and as a result, numerous studies have been conducted to study the extent of this gap (Margolis & Fisher, 2002). As early as the 1980s, studies had reported that females exhibited more negative views and perceptions towards the use of computers than males (Dambrot, Watkins-Malek, Silling, Marshall and Garver, 1985; Koohang, 1987). Studies reported in the literature over 20 years ago suggested that gender has had a mediating effect on attitudes and perceptions towards instructional technology but it is important to note that instructional technology was an adequate term then when computers were mostly used for mathematical and word processing tasks but today, computers are being used in various facets of life (Mitra, Lenzmeier, Steffenmeier, Avon, Quand Hazen, 2000). The integration of computers and IT into the education system has greatly influenced the mindset towards instructional technology. Hence, although the literature shows that extensive research related to gender and attitudes towards instructional technology has been carried out over the years, such findings may be irrelevant today because of the ever expanding nature of instructional technology. The debate over the gender gap that started since the 1980s still persists in the new millennium. Many researchers have revisited this issue and many are continuing to do so. For example, the study by Houtzand Gupta (2001) found significant gender differences in the way females and males rated themselves in their ability to master technology skills. Even though both genders were positive about their technological ability, males rated themselves higher than females. In another study, Shashaani and Khalili (2001) reported that female undergraduate students had significantly lower confidence than males when it came to their ability to use computers. Females also reported feeling helpless, nervous and uncomfortable around computers. So the objective of this study was to analyze the opportunities of access to Information and communication Technology(ICT) for male and female students at university level. This study was conducted to find answer of the research question: What ICTs were accessible for and used by male and female students at university level?

Significance of the Study

Access to new ICTs is a far away reality for under developing countries like Pakistan, particularly for females, who experience socio-cultural and economic hazards in their education and use of ICT. Given the lack of basic infrastructure, high cost in ICT installation and availability, lack of necessary operational skills, dogma that technology is men’ sphere, a significant portion of population remains deprived of using the ICTs, this poses more hazards for females. Even when they are educated, educated females are lagging behind males related to information and communication technology. The study may be helpful for future planners and think tanks that set patterns for coming generations and plan different techniques and approaches for future betterment of particularly the educational institutions and generally the youth. This study provides food for thought for curriculum developers and syllabus designers so they could include some topic related to practical social training and moral values. The subject of socialization will surely get a place in curriculum. The study will be useful for educational policy makers to understand the actual position of gender biases regarding use of ICT and as a result policy might be devised to eradicate inequalities in using the ICT. It is obvious that social workers play a pivotal role in social mobilization and modification of existing cultural and social values. This research will disclose new areas and as such, it will be useful for researchers to find and explain other dimensions relative to information and communication technology and gender issues that merit further study.



REVIEW LITERATURE

Information and communication technology has a strong effect in education and it provides enormous tools for enhancing teaching and learning. There have been many studies that have highlighted the various ways that ICT may support teaching and learning processes in a range of disciplinary fields such as the construction of new opportunities for interaction between students and knowledge; accessing information etc. ICT can have a useful effect on teaching and learning if it is used under the right conditions including suitable sources, training and support. ICT also offers the potential to meet the learning needs of individual students, to promote equal opportunity, to offer learning material, and also promote interdependence of learning among learners (Leach, Ahmed, Makalima & Power, 2005; cited in Cavas & Cavas, 2009).

Dunmilland Arslanagic (2006) define information and communication technology as a range of equipment (hardware: personal computers, scanners, and digital cameras) and telecommunications infrastructures (phones, faxes, modems, video conferencing equipment and web cameras, that allow us to access, retrieve, store, organize, manipulate, present, send material and communicate locally, nationally and globally through digital media. Blurton (1999) says information and communication technology is a set of technological devices and sources used to disseminate, communicate, store and create information. In the literature, while there are many definitions of ICT, it can be broadly defined as “technologies that facilitate, by electronic means, the acquisition, storage, processing, transmission, and disseminating of information in all forms including voice, text, data, graphics and video” (Michielsand Van Crowder, 2001; De Alcantara, 2001). This definition mainly focuses on the importance of the intersection of information technology, information content and telecommunications in enabling new forms of knowledge production and interactivity. ICT allows many people to generate and disseminate information, thus playing an active role in the process of interaction between professionals, learners, policy makers, peers and etc. (Leach, Ahmed, Makalima & Power, 2005) In the definition of information and communication technology in education, four main elements can be taken into consideration; ICT as an object that refers to learning about ICT, an assisting tool, a medium for teaching and learning and finally a tool for organization and management in schools (Monnen & Kommers, 1995; SER, 1998, Pilot, 1998; cited in Jager & Lokman, 1999).

The definitions of access to information and communication technology are based on three factors: quality of services, accessibility and affordability (Verhoest & Cammaerts, 2001). Warschauer (2004) defines access to information and communication technology in terms of physical access to ICT device. Different countries embrace the different concepts of what information and communication technology is necessary to provide. As an essential priority, when government should intervene to decide about the content, value- addition, infrastructure and justification of services to access ICT (Greene, 2003). Kirkman (1999) explains “when we speak about access, what we really mean is access to information, knowledge, and communications opportunities, not access to one specific services or technology”. Dorup (2004) in his study of Danish medical undergraduates expounded that majority of the students had access to computers at homes. He further added that males had more favourable attitudes toward computers than female students. Male students manifested their desire to change traditional learning methods with better information and communication technology. Schumacher and Morahan (2001) found that females exhibited negative attitudes towards computers. They also discovered that females possessed less experience of computer usage than males. There were also found prominent differences regarding computer literacy and between males and females.

Researchers (Clarke & Chambers, 1989; Ware & Stuck, 1985; Singh, 1995; Watson, 1997) made the observation that young children believed that ICT was the domain of males. Betz & Hackett (1981) reported that college male students held similar efficacy beliefs for traditional male occupations whereas female students had high efficacy beliefs for positions traditionally held by women but low self-efficacy for positions traditionally held by men. Research consistently showed that boys were more likely to be engaged in extracurricular activities with computers, such as using a computer at home and play computer games. It is also indicated that stereotypical male images found in computing magazines (Ware & Stuck, 1985) acted as deterrents for female involvement in technologies. Gender and ICT interact in complex ways but in the aggregate, females are much less likely to

participate in ICT courses, careers and leadership (Withers, 2000). Fenwick (2004) also showed that gender inequity persists both in access to and experience of learning opportunities with ICT.

METHODOLOGY

The research was targeted toward male and female students of public sector universities located in Islamabad. Population was consisted of male and female students at these universities. This population was targeted due to their similar geographical location, socio-economic and cultural background. The purposive sampling technique was adopted. The sample was selected from the targeted population. The sample was delimited to students from the faculties of social sciences from two public sector universities, an international Islamic university (IIUI),Islamabad and a national university of modern languages (NUML), Islamabad. The total number of the sample was four hundred. The sample was equally divided into two hundred female and two hundred male students of faculties of social sciences enrolled in postgraduate programmes during the Spring semester 2010. The sample of the population was further divided into 100 male and 100 female students of faculty of social sciences randomly selected from each university. A questionnaire was used to collect the data. This questionnaire was distributed to the targeted population with the permission of the heads of the different departments of faculties of social sciences of both the universities (IIUI and NUML) and personally collected. The questionnaire was structured on the basis of a Likert rating scale to provide the same frame of reference for male and female respondents. A draft questionnaire was piloting to identify the ambiguities and inadequacies. The pilot was distributed to fellow students and other research professionals of faculty of Social Sciences of International Islamic University, Islamabad. It was done to ensure that the instrument would obtain the desired data from the inputs of the fellow students and research professionals to ensure language comprehension, reliability, and validity of the questionnaire. A Cronbach's alpha was applied to measure the reliability of the questionnaire which was 0.89. Data collected through the questionnaire were tabulated, analyzed and interpreted. Percentage method and mean score was applied to analyze the data. Chi Square was used at $\alpha = 0.05$, significance level. The detail of the collected data is given below in table

Gender – wise details of Collected Data

No	Gender	Distributed Questionnaire	Collected Questionnaire	Percentage
1	Male	200	167	83.50%
2	Female	200	176	88%
	Total	400	343	85.75%

Statistical treatment of the data

Table: 1 Access of ICT for male and female students

No	Statement	Option	SA	A	UD	DA	SDA	χ^2	Mean
01	Access to all the ICT facility in the department	Male	35	92	6	25	9	145.31	3.71
		Female	22	73	19	39	23	57.95	3.17
02	ICT facilities are used under the discretion of the teachers.	Male	29	104	11	14	9	193.93	3.78
		Female	18	114	22	14	8	221.67	3.68
03	I integrate ICT with learning.	Male	81	53	17	10	6	126.26	4.16
		Female	39	84	24	18	11	95.86	3.69
04	Department has computer (CAI).	Male	9	17	17	75	49	93.03	2.17
		Female	15	45	21	66	29	47.69	2.72
05	Students often use ICT facility in the computer lab.	Male	41	84	19	16	7	114.53	3.81
		Female	49	82	11	22	12	103.6	3.76

Table 1: Illustrates that the calculated value of Chi Square respectively of statement 01 of male (145.31) and female (57.95), statement 02 of male (193.93) and female (221.67), statement 03 of male (126.26) and female (95.86) statement 04 of male (93.03) and female (47.69), and statement 05 of male (114.53) and female (103.64) is greater than the tabulated value 9.49 of Chi Square. Therefore, it is concluded that all the statements are significant for both male and female respondents. The mean score of statement 01 of male respondents (3.71) is greater than mean score of the female respondents. (3.17). this reveals that males are more satisfied with access to ICT facility available in the department. The mean score of statement 02 of male respondents (3.78) and the mean score of the female respondents (3.68) is almost same. This shows that both respondents exhibited agreement on the statement. The mean score of statement 03 of male respondents (4.16) and the mean score of the female respondents is (3.69). This shows that both male and female respondents were agreed regarding the integration of ICT with learning. The mean score of statement 04 of female respondents (2.72) is greater than mean score of the male respondents (2.17). This reveals that both the respondents disagreed with statement 04 as well. This finds that male and female respondents were not satisfied with the facility of computer assisted system of instruction. The mean score of statement 05 of male respondents (3.81) and mean score of the female respondents (3.76) is approximately same. This shows that both the respondents were agreed that students often use ICT in the computer lab

Table 2: Usage of ICT gender wise

No	Statement	Option	SA	A	UD	DA	SDA	χ^2	Mean
06	I use printers and scanners for studies	Male	15	104	11	20	17	187.82	3.48
		Female	19	62	14	56	25	55.41	2.97
07	Computer lab remains over - crowded.	Male	93	48	13	7	6	168.54	4.29
		Female	112	29	13	12	10	214.18	4.26
08	I use internet frequently in the computer lab	Male	30	81	14	32	10	95.90	3.53
		Female	13	24	14	97	28	139.13	2.41
09	Multimedia is frequently used in the classroom.	Male	10	25	14	100	18	169.68	2.46
		Female	16	26	9	88	37	110.74	2.41
10	Students are allowed to use ICT in office	Male	4	10	10	110	33	234.35	2.05
		Female	5	20	19	85	47	113.39	2.15

Table No.2 illustrates that the calculated value of Chi Square respectively of statement 06 of male (187.82) and female (55.41), statement 07 of male (168.54) and female (214.18), statement 08 of male (95.90) and female (139.13), statement 09 (169.68) and of male (110.74), statement 10 of male (234.35) and female (113.39) is greater than the tabulated value 9.49 of Chi Square. Therefore, it is concluded that all the statements are significant for both male and female respondents. The mean score of statement 06 of male respondents (3.48) is greater than mean score of the female respondents (2.97). So, male and female respondents replied that they don't use printers and scanners for studies in the department. The mean score of statement 07 of male respondents (4.29) and the mean score of the female respondents (4.26) is almost same. This reveals that both respondents were agreed to the statement. The mean score of statement 08 of male respondents (3.53) is greater than mean score of the female respondents (2.41). Male respondents were agreed to statement 08 whereas female respondents disagreed with statement 08. The difference in mean scores of statement 08 revealed gender differences. This reveals that males are more satisfied regarding frequent use of Internet facility available in the department. The mean score of statement 09 of male respondents (2.46) and mean score of the female respondents (2.41) is almost same. It reveals that multi media is not frequently used in the class room. The mean score of statement 10 of male respondents (2.05) and the mean score of the female respondents (2.15) is almost same. This explores that both male and female respondents disagree with statement 10 regarding permission to use office computers and phones therefore it revealed that they had restrictions regarding access to facility of ICT available in the offices.

Table 3: Opportunity for both male and female students

No	Statement	Option	SA	A	UD	DA	SDA	χ^2	Mean
11	Male students are facilitated more than female.	Male	14	56	19	52	26	44.76	2.88
		Female	68	52	27	10	19	65.44	3.8
12	Female Students hesitate to use office computers.	Male	11	97	19	25	15	154.59	3.38
		Female	62	60	20	20	14	63.24	3.77
13	Equal opportunities of ICT for male and female students.	Male	17	112	20	10	8	234.11	3.72
		Female	37	74	38	14	13	69.27	3.61

Table No.3 illustrates that the calculated value of Chi Square respectively of statement 11 of male (44.76) and female (65.44), statement 12 of male (154.59) and female (63.24), and statement 13 of male (234.11) and female (69.27) is greater than the tabulated value 9.49 of Chi Square. Therefore it is concluded that all the statements are significant for both male and female respondents. The mean score of statement 11 of female respondents (3.80) is greater than mean score of the male respondents (2.88). This reveals that females were more agreed with the statement 11 whereas male showed disagreement to statement 11. This difference of mean scores of male and female respondents indicates the gender differences found between male and female respondents. The mean score of statement 12 of male respondents (3.38) and the mean score of the female respondents (3.77) is approximately same. This reveals that female students hesitate to use office computers. The mean score of statement 13 of male respondents (3.72) and the mean score of the female respondents (3.61) is almost same. It reveals that both respondents were agreed to the statement 13.

CONCLUSION

Male and female respondents disagreed with statement 04 (Department has Computer Assisted Instructions (CAI) system) as well. This revealed that male and female respondents were not satisfied with the facility of Computer Assisted system of Instruction. New technology based Models of teaching and learning are needed to be implemented for improving educational outcomes. Males were more satisfied regarding frequent use of Internet facility available in the department. Male respondents were agreed to statement 08 (Students use internet for entertainment i.e. movies, chat, email.etc). Whereas female respondents disagreed that means male frequently used Internet than female respondents. Both male and female respondents disagreed with statement 10, (Students are allowed to use office computers and phones). Therefore, it revealed that they had restrictions regarding access to facility of ICT available in the office. Females were more agreed with the statement 11 (Male Students are facilitated more than female students to use Computers for study purpose). Departments should establish Computer Assisted Instructions (CAI) system to impart knowledge in more effective manner. New technology based Models of teaching and learning are needed to be implemented for improving educational outcomes. Male and female students should be provided equal opportunities of using Internet in the computer laboratory. Male and female students should have access to the facility of computer and phones available in the department. Training infrastructure should be set up in the department to provide training to females. All the universities may be equipped in such a way that the availability and accessibility of equipments, resources and facilities may be in accordance with the strength of class. University management enforcement for technology usage and incentives/rewards for the students/teachers to use instructional technology may be enhanced for getting good product of the higher education. Digital libraries are main source of information and research but their availability in the universities of third world countries has been found at a very low level. Therefore universities may equip themselves with digital libraries that interlink all the libraries of the world electronically and promote on line teaching.

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