Addressing the Increasing Gender Gap in ICT

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Approval

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Dedication

I would like to dedicate this thesis to my parents for always supporting me and standing by my side and both of my brothers for encouraging me to work hard stay motivated.

Certificate of Originality

I hereby declare that the research titled "***Addressing the Increasing Gender Gap in IT***" is my own work to the best of my knowledge. It contains no materials previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any degree or diploma at SEECS, NUST or any other education institute, except where due acknowledgment is made in the thesis. Any contribution made to the research by others, with whom I have worked at SEECS, NUST or elsewhere, is explicitly acknowledged in the thesis.

I also declare that the intellectual content of this thesis is the product of my own work, except to the extent that assistance from others in the project's design and conception or in style, presentation and linguistic is acknowledged. I also verified the originality of contents through plagiarism software.

Author Name: Iqra Aslam

Signature: _____

Acknowledgment

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Abstract

Mostly girls who enroll in Computer Science/Information Technology programs; either change their field after getting the degree or quit it before completion of the degree, which is a great loss for our country's socio-economic development, and this becomes the reason of female underrepresentation in the tech market. To find out the reasons for girls' hesitation in choosing ICT as a career in Pakistan, we conducted a need analysis (base study) on a sample size of n=167. The participants of the base study were female participants enrolled in public school students of Grade 7-10 from different districts in Punjab, female students at the undergraduate level, a few housewives and some working women. Factors extracted of the study were that females lack self-efficacy and confidence that they can perform better than boys. MS office is part of the curriculum at primary levels but 31.7% of the students mentioned that they have never used a spreadsheet. An intervention was designed based on the factors that we found out as a result of the base study to find out the change the perception of female students of secondary level and the females studying at the university level. This research includes sample from two settings i.e. School Students n=234 and University Students n=209. There is a strong relationship between female's access to technology and their career choices. All the girls at university level own a mobile but 74% of them still face restriction to use mobiles from their parents. Results showed that students in higher secondary level have an enthusiasm to learn technology, but they do not get access and guidance which creates a leaky pipeline in the tech market. We need to focus these initial stages of females education to develop self-confidence, interest and motivation as females lacks interest in learning technical skills gradually.

Keywords: Girls, ICT, Gender, Pakistan, Female Underrepresentation, Girls' hesitation in choosing ICT, Perception of Girls

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List of Abbreviations:

ICT – Information Communication Technology

CS – Computer Science

IT – Information Technology

SPSS - Statistical Package for the Social Sciences

MOOCs - Massive Open Online Courses

SDGs – Sustainable Development Goals

KPK - Khyber Pakhtunkhwa

NGO - Non-Governmental Organizations

HTML - Hypertext Markup Language

CSS - Cascading Style Sheets

STEM - Science, Technology, Engineering and Mathematic

CC4G – Computer Club for Girls

DPT – Desktop Publishing Tool

CT – Computer Technology

OECD - The Organization for Economic Co-operation and Development

MWL - Mighty Draw Windows Library

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Chapter 1: Introduction

The world has become a global village and computers are taking over everything like banking, shopping, teaching, learning, house cleaners and almost everything else. There are 4.68 Billion mobile phone users worldwide which are increased from 4.16 Billion in 2015 and is predicted to increase more up to 4.78 Billion in 2020 according to a survey mentioned at the Statista (Statista.com, 2016). Internet usage is also increasing day by day and number of internet users till March 31, 2019, is 4,383,810,342 according to Internet World Stats (Internetworldstats.com, 2019).

1.1 Background

Technology has become an important part of our life as you can see it everywhere around you. Robots, the latest invention of technology, are helping humans to do difficult tasks easily and efficiently. Robots are becoming more intelligent and being integrated to all the departments, for example, education, health, architecture and many more. Technology is so much involved in our life that it has become important for us to know how to use and interact with it.

Digital literacy is a person's ability to use and understand different digital platforms like typing skills, navigation and basic interaction with technological tools. It is the most important pre-requisite of today whether it is a job, degree or even to use technology in daily life. People are expected to know how to use computers, mobiles, and other technology devices.

A few decades ago, face to face learning was the only way to get an education. Those who have access to schools would have a chance to get an education while the other who are living far away or especially girls who are not allowed to go to school remain illiterate. Same was the case with universities, A few students had access to higher education. After the introduction of technology in education in the form of distance education, MOOCs or other online resources, A

lot of students especially girls can now get an education even when staying at home. This not only improves the literacy rate of our country but empowers women to become independent and become able to earn for themselves.

1.2 Problem

Education system worldwide is facing problems like lack of access and quality of education. In Pakistan, We have same problems that other countries are facing along with a few context based issues as well like parents restrictions, fear of sending girls to the school and a perception of educating a girl being a threat to the honor of a family.

1.3 Lack of access & Quality education

A child born in a low-income family has less chance to get quality education and they even score less than the students from rich families. Students who belong to rich families also get admission in best colleges while those who are poor have to take admission in low-quality colleges. According to a study conducted by (Reardon, 2014), in a graduating class of 2014 in a high-class university, there were 15% of students who belonged to rich families with 3% from middle income and 2% from the low-income families. In Pakistan, 22.6 Million children (between age 5-16) are out of school and 55% of them are girls (Ailaan, 2014).

1.4 Sustainable Development Goals (SDGs)

In July 2014, a document was proposed by the UN general assembly Open Working Groups (OWG) including 17 goals or targets to be achieved by 2030. These goals are known as Sustainable Development Goals (SDGs). These are universal goals to maintain a peaceful life, end poverty and protect the planet. SDGs support inclusion of all people like people with disabilities, low socio-economic background or indigenous people who were ignored while making policies of a country. An important goal of SDGs is that by 2030, gender discrimination

should be eliminated to ensure that women get equal access to quality education and vocational training at all levels as mentioned on UNESCO (Education and gender equality) and Sustainable Development Organization (Sustainable Development Goals). Girls face many issues as compared to boys when it comes to education like parent's restriction, society, stereotypes, and lack of interest. Parents usually consider that letting their daughters' study is a waste of money which is more important for their son's as they have to support a family in the future. Computers are helping us in overcoming gender parity by providing access to resources and quality education free of cost. Online courses are available for all levels of education from primary to a higher level. E-learning has become an essential part of the education system and most of the institutions have introduced blended learning in the classrooms. Blended learning is the type of learning environment which includes both face to face and online learning. It included all kind of technology devices like mobiles, computers, laptops, personal digital, etc. All we need to do is to learn how to use technology and access these resources. Teachers need the training to use technology as they have to teach and train their students afterward.

1.5 Policy of Pakistan

Pakistan is far behind from other countries when it comes to computer literacy. People have mobile phones or laptops, but they are not able to operate it on their own or without the usual tasks. Pakistan is lagging behind Bangladesh according to a report. Although Pakistan has an extensive on the policy document in it is mentioned that students and teachers need to get a hand on ICT tools. According to the (National Education Policy , 2017), Access to ICT will be provided to all the students by setting up labs in schools, train teachers to use ICT and build on best practices of current ICT programs. A survey by Internet World Stats (2019) showed that

Asia has the most internet users as compared to other countries as shown in Figure 1. but still Pakistan being one of the Asian countries, has a negligible literacy rate.

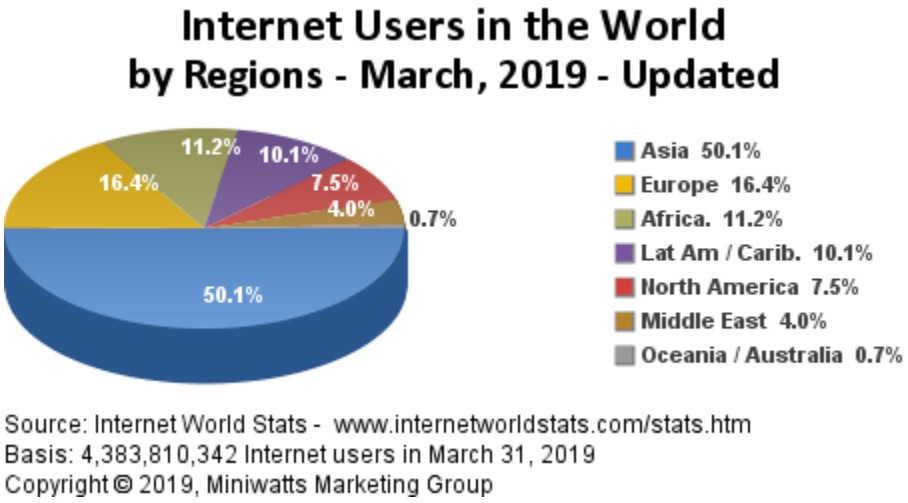


Figure 1: Asia has the most internet users as compared to other countries

1.6 Teachers and Computers

Although the national education policy emphasizes a lot on the use of ICT in schools still students are not choosing a career in IT or CS. We cannot expect positive outcomes by just throwing technology in schools or making fancy computer labs with restricted use of computers for students. During a school visit for a survey, I heard a teacher shouting at students that they are not allowed to go to computer lab other unless they have a computer science class and the teacher was advising them to use computers only when the teacher is around them. That incident made me think that the environment in an institute also affects the students about their choices as a career just like in this scenario, the teacher was developing fear in students about technology.

1.7 Base study and factors

We did a base study with a sample of 157 females including students, teachers, ICT professionals, housewives and women doing other kinds of jobs to find out if the problem actually exists. Results showed that students lack motivation, interest, awareness, access, and self-efficacy when it comes to technology. Then we developed our intervention on the basis of the factors that affect girls in choosing ICT as a career that we found in our case study.

1.8 Women and Technology

In Pakistan, 48.76% of the population consists of women (SamaaTV, 2017) and if we still ignore this proportion it would be difficult to overcome the low economic development of Pakistan. Women should be working in all the departments. If we talk about technology, there is a concept of a leaky pipeline which is that women are coming to the field of technology, but they do not choose a career in the field of technology. There are many factors that affect girls while choosing a career like family pressure, stereotypes, skills level, awareness or motivation. Pakistan is the country with the least economic growth, and we need to encourage females to work and help in the economic development of Pakistan. We need to eliminate the stereotypes and reduce the negative environment which are keeping women to work independently. (Sarfaraz, 2018)

1.9 Paulo Freire theory of pedagogy of oppressed

Paulo Freire proposed a theory in which he discussed oppression and how to eliminate this oppression. So, according to this theory (Pedagogy of the Oppressed, 2005), we need to develop critical thinking in females so that they should be able to understand what is right for them and they should have the self-confidence that they are able to perform best in any field of life. This theory will help us to change the mindset of females who think that boys are better with technology than girls.

1.10 Objectives

This research and intervention help us in developing a sense of awareness, self-efficacy, and confidence in women that they are not less than anyone else. This can help us to maintain a good economy of Pakistan. The objective of this research and intervention is to help women in reducing the increasing gender gap in the field of technology and help them to think in a different way and make themselves independent. This will also help us in fighting against the oppression caused by society and stereotypes that are keeping women from working and choosing ICT as a career.

1.11 Statement of Purpose:

The purpose of this study is to find out the reasons for girls' hesitation in choosing ICT as a career in Pakistan. Previous research showed that girls lack interest and motivation to choose ICT a subject in higher studies and career as well and. Also, the wrong perception, of parents and the girls themselves, about technology is the reason for increasing gender gap in the field of technology. The study will also examine how much we can motivate girls, in their secondary school level, towards this field by developing technological interventions to encourage them to choose CS or IT in the future.

1.12 Significance of the study:

This study is very important because the gender gap in the field of technology in increasing and this is not just an alarming situation for Pakistan but all over the world. Women are underrepresented in the field of IT and CS. We need to develop an awareness in girls regarding the importance of technology and their presence in the field. According to previous researches, there are many factors like parent's restrictions, society, and girl's interest are the problems that affect them in making any decision about their career especially in ICT, parents restrict them

from choosing CS and IT and girls feel less confident while studying CS and IT. This study helped in knowing the overall problem for girls in Pakistan while choosing CS and IT and the technological intervention helped in developing the interest of the girls towards technology. This research helped us to break the stereotype for many people that CS and IT are not only for boys but for girls as well. This study developed an awareness of participation in these fields to increase the economy of Pakistan.

1.13 Background:

The curriculum followed in Pakistan include ICT as a subject from the very beginning (from grade 1) but still, it can be seen that most of the girls do not pursue Computer Science and Information Technology as a career as they think that CS and IT are not a girls field. Girls also find this field difficult when they come to know about programming, coding and it haunts them to choose this career. In Pakistan, Computer Science and Information Technology are considered male dominant fields and this concept has made it very difficult for the female students to pursue a career in ICT. Most of the time, girls who enroll in these programs either change their field after getting the degree or could not complete the course which is a great loss of our country's socio-economic development.

A research was conducted in KPK which concluded that the female's perception about the fields of CS and IT is a problem that they are lagging behind, and this is the reason that there are only 14% females enrolled in the CS and IT departments in Pakistan. Globalization has made the use of technology an important part of life. In developed countries, women are more exposed to technology as compared to Pakistan even in developing countries Pakistan has the lowest percentage of women workforce as shown in the Figure 2 below. (Wajeeha Khalil, Sundas Nayab & Tanawush Naeed, 2015)

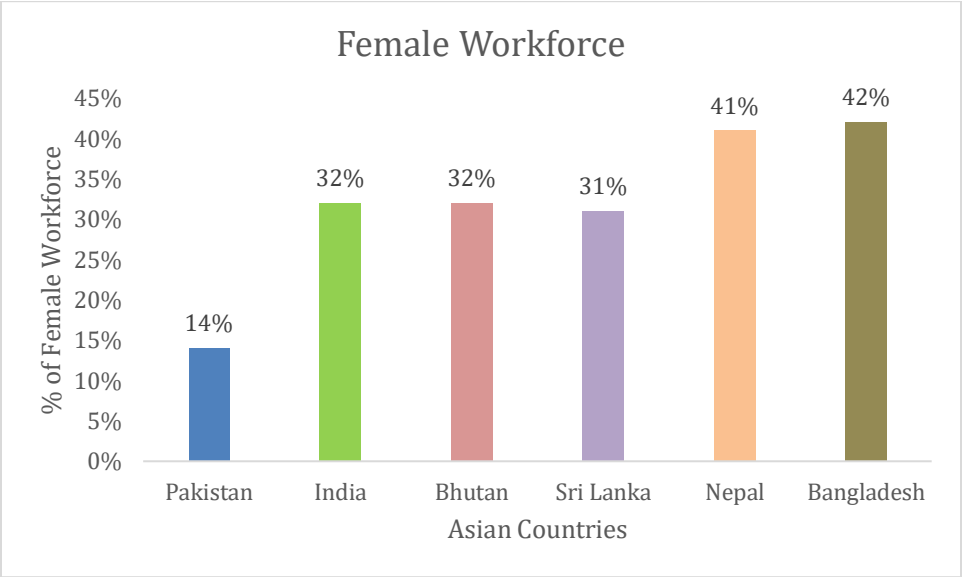


Figure 2: Percentage of female work force in Pakistan is low

I visited a school where ICT teacher told me that girl's parents come to school and ask us not to teach Computer Science to their daughters as it will be a disadvantage for the honor of their families in future. There could be many other reasons like lack of resources, expenses of education, lack of interest, difficulty in understanding, etc. I will also try to find out the barriers for girls in choosing technology as a profession.

This is a problem in all the countries not just in Pakistan. This digital gender gap is increasing everywhere and for this Adriana Gascoigne launched the NGO "Girls in Tech" when she realized that she was an only female member in her technology company and she decided to launch this NGO because she wanted to engage and empower women in Technology. (Marwan, 2017)

An initiative which is arranging programs like Code Girls where they teach coding to young females between age 15-30 and these programs are fully funded so that girls belonging to middle-income families can also learn the technical skills like HTML, CSS, Java, Programming, WordPress and many more (WomenintechPK).

2 Literature Review

A few references from the literature or previous researches are given bellow:

2.1 Low Self-efficacy:

A qualitative study in a high school in New Jersey was done to find out how girls are threatened and underrepresented in the fields of Physical Science. They concluded that school's self-efficacy in STEM courses affect girl's achievement in STEM-related courses and girls should be respected for their intentions and decisions they make for themselves to reach their full potential in all areas of STEM according to Jill Voorhees & Ane Turner Johnson (2017, pp. 79-113).

2.2 Access:

An Empirical research in the United Kingdom by Rachel Louise Palmen (2011, pp. 407-423) to find out the relationship of different genders with ICT at the secondary school level. Their findings showed that girls were less confident, not interested and less motivated to choose ICT as Career and they also have less access to computers and mobiles as compared to boys. So as a solution, they build a setup called "Computer Club for Girls (CC4G)" for girls between ages 10-14. Their objective was to change the perception, within the target group of IT as a career for women by offering inspiring and compelling activities which appeal to girls in a voluntary computer club environment and to counter the perception, within the target group that IT is a male profession. After some time, BA, IBM and Cisco also joined them to eliminate the gender imbalance in the field of technology. Their focus was to develop an interest in girls for Programming, Designing Website, Creating Database, and Macromedia Flash Authoring Tool. When girls joined this club and worked there, they found out that girls, especially the older ones, confidence was increased to use technology and they were more engaged with the activities they were performing in that club.

To measure the digital gender gap in IT, A quantitative survey was conducted by with 535 adults including men and women. Participants expressed their views like their daughters will run away from home with any other boy and vulgarity is being spread by watching TV so they do not allow their women to watch TV or use mobile phone. Radio technology is readily available for the women in rural areas of Pakistan but sometimes, they also need permission to listen to radio as discussed by Karin Astrid Siegmann (2009).

2.3 Curriculum and society:

A comparative study to compare the reasons that affect women of UK and Spain in choosing ICT as a career was done by Cecilia Castaño & Juliet Webster (2011, pp. 364-386). They used a metaphor "Leaky pipeline" which means that women disappear from the fields of science and technology as they move forward in their career. They mentioned that women's society and family structure, background, Male-dominant culture at the workplace are the reasons for the leaky pipeline which needs to be addressed. According to them, the Curriculum of ICT is discouraging girls, class teacher discriminates between genders and their social structure, and family backgrounds affect girls' choice in choosing a career.

2.4 Gender-inclusive educational tools:

An empirical study with 9th graders to find out the importance of educational technology tools and learner's experience with them was done by Irma Heemskerk, Geert ten Dam, Monique Volman & Wilfried Admiraal (2009, pp. 253-276). In that study, it was mentioned that there is no gender difference in the use of ICT but, still, the attitude of both the genders are different towards technology. Technical tools, the content presented, and the interface should be engaging and attractive for all students (Male and Female) and no one should feel left out while using them. In their findings, girls reported working easily with gender-inclusive educational tools.

Through these inclusive tools, we can develop equal competencies and interests in girls as developed in boys.

Another factor is that students' as stakeholders are not involved while developing the curriculum of CS/IT which makes it less aligned to the context of the students. Students indicated their interest to choose ICT as a degree and as a career as well but at the same time they also explained a concern that ICT is being taught as other theoretical courses and they do not get any hands-on experience. 72% of their participants agreed that computer science is a difficult subject. I agree with their findings that students who found computer science difficult are those who did not have access to computers for their basic knowledge like MS office, so they just have to cram the whole content without understanding it. This research also involved teachers who thought that curriculum has no issues and it is beneficial for students the way it is.

2.5 Role models:

The gender gap in STEM fields is increasing day by day in the United States and to overcome this gap, students of The School of Engineering and Computer Science, Society of Women Engineer, American Society of Mechanical Engineer started an annual Girl Scout Day Camp for girls between age 6-11 as stated by Cynthia C. Fry, Jessica Davis & Yasaman Shirazi-Fard (2008). They explained the activities related to STEM that they performed in three years (2005-7). They used very basic STEM activities like Discovering Technology, Math Whiz, Build a Computer etc. Girls who were involved in these activities were observing the girls as role models who were undergraduate students, they were taking interest in these activities and developed self-efficacy that they can perform the task they never thought they are able to do. A balance of Challenge and Scaffolds by Girl Scouts kept them engaged in these activities.

2.6 Computer anxiety:

A quantitative research study was done by David Morris & John Trushell (2014, pp. 4-9) mentioned that only 18% of IT professionals in the UK are females and 22% of ICT teachers are female. They did a quantitative study to find out the perception of girls, in primary level in school, toward programming and ICT. A questionnaire was given to students (22 Boys and 26 girls) to know their thinking about ICT. Two tasks were given to students based on Programming software, Microsoft Windows LOGO (MWL), and a desktop publishing (DTP) program, Microsoft Publisher. Their findings showed that Programming is male dominant and DTP is the female one. Females have computer anxiety as only 7.2% of girls took Computer Science as a subject in A-levels as compared to 92.5% of boys in 2011.

2.7 Attitude towards the use of technology:

A quantitative research was conducted by Jo Tondeur, Sarah Van de Velde, Hans Vermeersch & Mieke Van Houtte (2016, pp. 57-77) and they Collected data from 1138 university students in Belgium to find out the relationship between gender and the attitude towards the use of technology. Their findings indicate that attitude towards technology is context dependent. Girls/women have a negative attitude towards computers outside the class. But when it comes to the using of computers for study purpose, there is no significant difference.

In 2014, a survey was conducted by Hina Habib, Muhammad Ateeq, Adnan Umer & Muzammil Ul Rehman (2014, pp. 84-91) with the sample size of 35 in which 20 students were females and they found out that females do not lack any self-efficacy or interest when it comes to using computer. It is the family pressure or societal factors that affect girls to from choosing ICT as a career. They found out that females have the competency and motivation to learn technological skills or do a job, but they have to quit it either due to the financial status of the family or the fear

of parents of working or studying with opposite genders in university. 5 of the females expressed that they do not have any career planning while 4 out of 6 females decided to become a teacher in future. Another important factor found was that there are equal number females that want to pursue a career in programming as boys

2.8 Family Support:

Joseph Appianing and Richard N. Van Eck (2015, pp. 28-56) also used the metaphor of leaky pipeline which means the gradually decreasing women in the field of technology. They developed a questionnaire (Value, Interests, and Expectations for Success) to find out the perception of college students in the United States about the field of Computer Technology (CT). According to them, Family influence i.e. perception of parents or siblings about technology can influence girls in choosing CT as fathers are more likely to buy computers for their sons but rarely for girls. Computer Anxiety, Self-Efficacy, negative relationship with teacher make them less interested to choose CT as a career. Girls who are exposed to computers have more chance to develop an interest in computers.

Eduarda Ferreira Cristina Ponte & Teresa Sofia Castro (2017, pp. 1-6) discussed an interesting topic that parents who are gender stereotypes to use technology can influence their children to use technology in a discriminated way as parents are role models for children. Mothers use the simplest technical devices while fathers use difficult/complex ones. So, parents' value more on boys as compared to girls to learn skills related to technology and the internet. This valuing difference leads to low self-confidence towards digital technologies.

In Russia, only 24% of females were enrolled in BSc and MSc programs as compared to 76% of males for the academic year of 2013-2014 as mentioned by Tanya Stanko and Oksana Zhirosh (2017, pp. 88-93). For the academic batch of 2016/2017, they did a research again and found out

that parents or other family member's perception about CS/IT and their support for their children has a significant impact on the career choice of students. They also pointed out the importance of family members and parent's awareness about technology and its uses that will help parents to support their children in every decision of their career path.

2.9 Boys are Better than girls at computers:

Gender Awareness in ICT with Focus on Education is a program by OECD (2008) in Sweden where a Pilot Study (Survey based) was performed, to check the impact of this program, on 33 students from one class of 15 year old's and one class of 17 year old's of two schools. When the students were given questionnaires to fill, Girls had no pre-requisite knowledge to complete it. Their findings showed that all students had computers and internet access at home, Boys used Console to play games, but girls played only on the computer. 60% of the girls strongly disagreed that their teachers help them to use a computer in schoolwork. Girls and boys had almost the same opinion that boys are better than girls at computers.

2.10 Freelancing:

A case study discussed the increasing use of technology especially mobile phones to empower women who are disadvantaged and underrepresented like in Africa. Nancy Spence (2010, p. 69) discussed that technology can empower women in social and ecumenical aspects. She mentioned many case studies that show how women are working from home, in fields or personal use of technology, for example, The Asian development Bank-Funded Doctor Program that helped Piyara Begum to become an advisor by just doing a phone call using her mobile phone to help farmers in overcoming the problems they are facing. Women can communicate easily; they can work from home and help in the economic development of the country.

2.11 Research Question and Hypothesis:

1. What are the factors that affect girls while choosing a career in ICT in Pakistan?
2. How technology can help in changing the perception of females to choose a career in ICT?

Hypothesis are:

H_1 : Girls' exposure, access to technology and stereotypes helps in motivating them to choose ICT as a career

Null: Girls' exposure, access to technology and stereotypes does not helps in motivating them to choose ICT as a career

H2: Girls gradually lack motivation to learn technical skills/subjects

Null: Girls gradually lack motivation to learn technical skills/subjects

Chapter 3: Methodology

3.1 Need analysis survey (Base study):

A base study was conducted before the actual research to find out the factors that are affecting girls in choosing ICT as career.

3.1.1 Context of the study:

This study was focused on finding the factors that affect girls in choosing ICT as a career in Pakistan. The survey has been conducted with girls/women from different economic backgrounds, rural and urban areas of Pakistan. So, the results are evaluated independently, without considering the type of economic backgrounds of participants.

3.1.2 Participants:

The participants were female students of class 8^{th}, 9^{th} and 10^{th} grade from different cities of Pakistan. They were girls/women from different age groups, fields, study level and profession because the intention is to take the perspective of females who are working or studying CS or IT that what is their motivation to join these programs or are they willing to do a job in future in the same profession. And the females who do not get a chance to choose technology will be sharing their problems that why they did not get a chance to study CS or IT. Those who are doing jobs in this field will be sharing their experiences. Details of the participants are given in the Table 1 bellow:

Participants	
Students	152
Teachers	10
Housewives	3
Job	1
Other	1

Table 1: Number of Participants in Base Study

Participants belonged to the different education levels. 72.5% of them have mentioned their education level as matric followed by 12.6% as intermediate, 5.4% as Masters, 4.8% as Bachelors level, 3.6% of them studied till primary level and one of the participants was illiterate and one was a PHD scholar this can be seen in Table 2 bellow.

Education	
None	1
Primary	6
Matric	121
Intermediate	21
Bachelors	8

Master	9
Phd	1

Table 2: Level of Education of Participants

Since most of the participants are from matriculation level so the age group with maximun number of participants is between age 12 to 18 as mentioned in Table 3 followed by 23 participants from group 19 to 25, 13 participants from 25-35 and 5 participants with age more than 35 years of age.

Age Group	Number of Participants
12-18	126
19-25	23
25-35	13
35+	5

Table 3: Number of participants with age group

3.1.3 Research Instrument:

Research Instrument was questionnaires for this study.

3.1.3.1 Reliability & Validity:

A questionnaire was used to find out the factors affecting girls in choosing ICT as a career. Reliability and validity of the questionnaire were checked with the Cronbach's Alpha greater than 0.6 which is acceptable. The overall reliability of the instrument was 0.64 which showed that the questionnaire was reliable to proceed with the base study.

3.1.3.2 Variables:

This study covered factors like motivation, interest and self-confidence and parent's perceptions, society's norms effects on girls in choosing ICT as a career. Whereas this study also found out the perspective of women who are already working in the field of technology. We considered motivation, students' self-efficacy, parent's perception and student's personal interest as the factors that influence students learning and each participant expresses their views.

Participants were clearly provided with the information regarding the purpose behind this research. It was clearly mentioned that the questionnaire is designed by a student of University and the purpose is research to know what factors affect girls in choosing ICT as a career, and participants provided their views for this by ticking on the given questions using 5-point Likert scale and a few of them wrote comment at the end in the comment section.

The survey was quantitative with a 5-point Likert scale and participants had to choose from strongly agree, agree, neither, disagree and strongly disagree with the 16 statements that were mentioned in the questionnaire given in Appendix A. The sections for gender, grade level, Name, occupation (student/job/housewife) were also given but Name is optional. A comment section at the end of each questionnaire is also provided so that participants can share those views that we have not mentioned in our questionnaires and more important factors. The keywords used in the surveys were motivation, restriction, and personal interest.

3.1.3.3 Design:

The nature of this research is descriptive and experimental. The descriptive analysis gave us a detailed description of our data and the results of experimental will be used. Initially, Quantitative data was collected through a questionnaire to find out the factors affecting girls to choose ICT as a career.

This study focused on what are the factors that affect girls in choosing ICT as a career in Pakistan. The survey was conducted with girls/women from different economic backgrounds, rural and urban areas of Pakistan. So, the results are evaluated independently, without considering the type of economic backgrounds of participants.

The survey is quantitative with a 5-point Likert scale and participants had to choose from strongly agree, agree, neither, disagree and strongly disagree with the 30 statements that were mentioned in the questionnaire given in Appendix A. The sections for gender, grade level, Name, occupation (student/job/housewife) were also given but Name is optional. A comment section at the end of each questionnaire is also provided so that participants can share those view that we have not mentioned in our questionnaires and more important factors. The keywords used in the surveys were motivation, restriction, and personal interest.

3.1.3.4 Procedure:

All the girl's participants from grade 7th-10th from some schools in different cities of Pakistan and women who are either working or who are housewives were given questionnaires. The researcher explained the purpose of research and the importance of their participation in the research. The researcher also ensured the privacy of the participants by telling that their name is optional, but age and occupation are important for the research and asked them to give an honest response. These questionnaires provided quantitative data. Although a comment section was provided at the end of the questionnaire, most of the participants did not want to write anything.

3.1.3.5 Data Analysis:

Quantitative data is analyzed by using SPSS IBM 23. Descriptive analysis is used to describe the average/mean results of the response that we got from participants. Frequency analysis is also

used to find out the percentage response of each of the variable of the questionnaire to get the factor which is affecting girls the most in choosing their career in ICT.

3.1.3.6 Results:

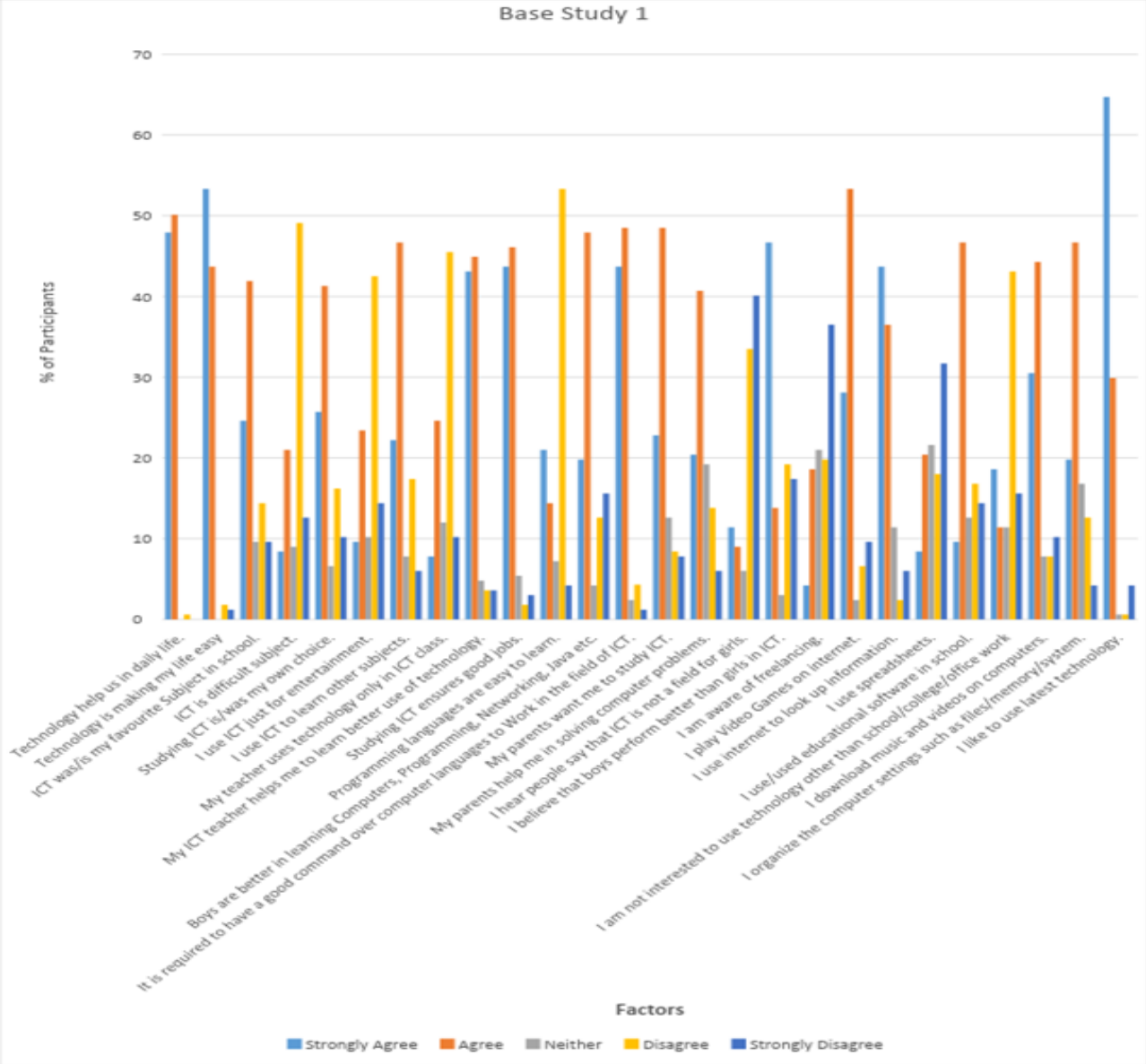


Figure 3: Results of the Base Study

According to the results of base study that are shown in the Figure 3, 53.3% of the participants thought that programming languages are difficult to learn and 48.5% of them agreed that only

programming languages will ensure good jobs which indicates a low motivation to learn these languages and overall, choosing IT/CS as a career. We need to tell them that it's not solely the programming that they can opt for but many other fields like graphics designing, content development, Data Entry, UI and UX designing, etc. which can be done online as well. 47.9% thought that boys are better at learning computers, Programming, Networking, and Java, etc. while 46.7% of the females thought that boys perform better than girls in ICT which shows that girls lack the self-efficacy and confidence that they can perform better than boys. 36.5% of the females strongly disagreed that they are aware of freelancing. 31.7% of the females mentioned that they have not used a spreadsheet which is a part of their curriculum/Textbook of ICT. The Factors that affects girls in choosing ICT as a Career are given in the Table 4 bellow:

3.1.3.7 Factors Found in Base Study:

Factor	Reasons
Lack of Confidence and interest	• Boys perform better than girls • Boys learn programming and networking quickly
Lack of Awareness	• Freelancing • Spreadsheet
Lack of Self Efficacy	• Difficult to learn
Lack of Motivation	• Do not want to use technology other than class/work

Table 4: Factors as a result of base study that affect girls in choosing ICT as a career

3.1.3.8 Conclusion of Base Study:

This study concluded that females think that boys perform better than girls and if they choose ICT as a career, it would be difficult for them to learn programming languages. ICT after being

introduced as a core subject is not helping enough to develop basic skills in women. We need to develop confidence in females that they can outperform boys and learn to program easily after practicing. Another factor that motivates anyone to choose a career is earning from a job. Freelancing is increasing day by day and around 56.7 Million of Americans are working as a freelancer (Upwork, 2018). According to (Abbas, 2019) , Freelancing is the emerging trend as Pakistan is at the third rank of global freelancers' market. In this case, freelancing the best option for everyone especially females who do not want to work in an office or live in far-flung areas.

3.2 Training on building perception (Actual Study)

On the bases of the factors that we found in need analysis, we planned some trainings for the female students in a school and a university.

3.2.1 Entry Protocol:

The school where the intervention took place, was a public high school in the district of Lodhran, Punjab, Pakistan. The headmistress of the school was very passionate about her school, learning environment and her students. I told her about the purpose of my research and the benefits of my intervention and requested her to allow me to do my research and intervention in her school with 9th and 10th-grade female students for 15 days. She has not just agreed to it even asked me to give a few lectures in the other classes as well so that students would know the importance and benefits of choosing ICT in the future. There was a tree plantation campaign going on at that time so she asked me to become the part of it and I suggested her to include students in this campaign so that they will be involved with some physical activity. So, I was also involved with other activities as well.

When it came to university, it was easy for me to reach the head of the department as I was the alumni and he appreciated me as well. Head of the Department referred me to discuss it with the

program coordinator of CS and IT. When I went to the coordinator of the CS department, he refused to help me and did not allow me to do any intervention. But the coordinator of IT was very kind that he allowed me to do this intervention with Undergraduate students of Information Technology for a week. I also requested the head of the department of economics and he also allowed me to do my research with Post-graduate students for a week.

3.2.2 Participants:

Participants for this study were 234 female students of class 9th-10th with science, arts, and computer science major. This is the level of education where students decide about their future or their career. For university, Participants were 209 students from undergraduate and Postgraduate level.

3.2.3 Instrument Design:

The instrument for this research was designed with the help of the supervisor and GEC members. The instrument was divided into four main factors that affect girls in choosing ICT as a career that we found out in our base study like Access to technology, learning environments in institutions, Perception of females and how confident they are with technology. These factors included a few sub factors as well which we also found out in base study results and by reviewing the literature.

3.2.4 Context of the Study:

This study focused on an intervention to encourage more female students to choose ICT as a career in Pakistan. The surveys were conducted with girls from different economic backgrounds, rural and urban areas of Pakistan. So, the results are evaluated independently, without considering the type of economic backgrounds of participants.

3.2.5 Research Instrument:

Research Instrument for will be questionnaires for this study.

3.2.5.1 Questionnaire:

This study covered factors like motivation, interest and self-confidence and parent's perceptions, society's norms effects on girls in choosing ICT as a career. Whereas this research also found out the perspective of women who are already working in the field of technology. We considered motivation, students' self-efficacy, parent's perception and student's personal interest as the factors that influence students learning and each participant expresses their views.

Participants were clearly provided the information regarding the purpose behind this research. It was clearly mentioned that the questionnaire is designed by a student of University and the purpose is research to know what factors affect girls in choosing ICT as a career, and participants have to provide their views for this by ticking on the given questions using 5 points Likert scale or providing comment at the end in the comment section.

3.2.5.2 Pre-Assessment:

The questionnaire was divided into four categories like Access, Perception, Learning Environment and confidence which affect girls while choosing the career. Each category has a subcategory which are the variables for our research. These questions were designed and tested for reliability with Cronbach Alpha (0.69) and validity to check if it was giving the right results. A section with "Why do you think boys are better in Technology- Give three reasons?" was added at the end of the questionnaire to add any other reason that they want to share and it was a way to get some qualitative data. Only a few of the students replied to this question.

3.2.5.3 Post-Assessment:

A questionnaire was developed for post assessment with the same variables but this one was not divided into any categories. At the end, we have added a section for the participants to give feedback for the workshop they have attended. Table 5 gives an insight of the independent and dependent variables.

Variables	
Dependent Variable(s)	Independent Variable(s)
1) Girls' career choice 2) Girl's motivation 3) Interest to learn ICT skills 4) Perception	Access of technology
	Family support
	Stereotypes
	Confidence
	Personal interest

Table 5: List of Dependent and Independent variables

3.2.5.4 Design:

The nature of this study is descriptive and experimental research design was used. Descriptive will give us a detailed description of our data and the results and experimental will be used when we will design and implement an intervention to find out either technology can help to overcome this increasing gender gap in the tech market. First of all, Quantitative data will be collected through a questionnaire.

3.2.5.5 Procedure:

All the girl's participants from grade 8th, 9th, and 10th from some schools in different cities of Pakistan and women who are either working or who are housewives will be given questionnaires. The researcher will explain the purpose of research and the importance of their participation in the research. The researcher will also ensure the privacy of the participants by telling that their name is optional, but age and occupation are important for my research and will ask them to give an honest response. These questionnaires will provide quantitative data.

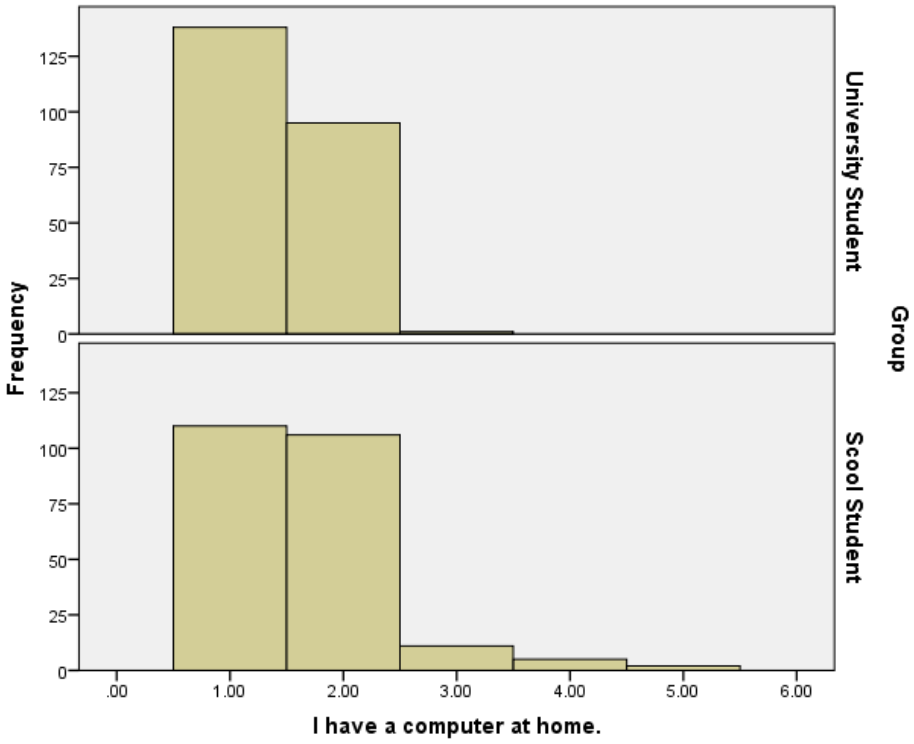
3.2.5.6 Data Analysis & Results:

Quantitative data will be analyzed by using SPSS IBM 23. Descriptive analysis will be used to describe the average/mean results of the response that we got from participants. Descriptive and Frequency analysis was done on this data. The descriptive analysis gave us the values of mean, standard deviation and frequency analysis was used to get the percentage of response by the participants for each variable. Since the questionnaires were 5-point Likert scale (i.e. Strongly Agree, Agree, Neither, Disagree and Strongly Disagree), which is always a to be a non-parametric data. But to confirm this, we applied the non-parametric normality test.

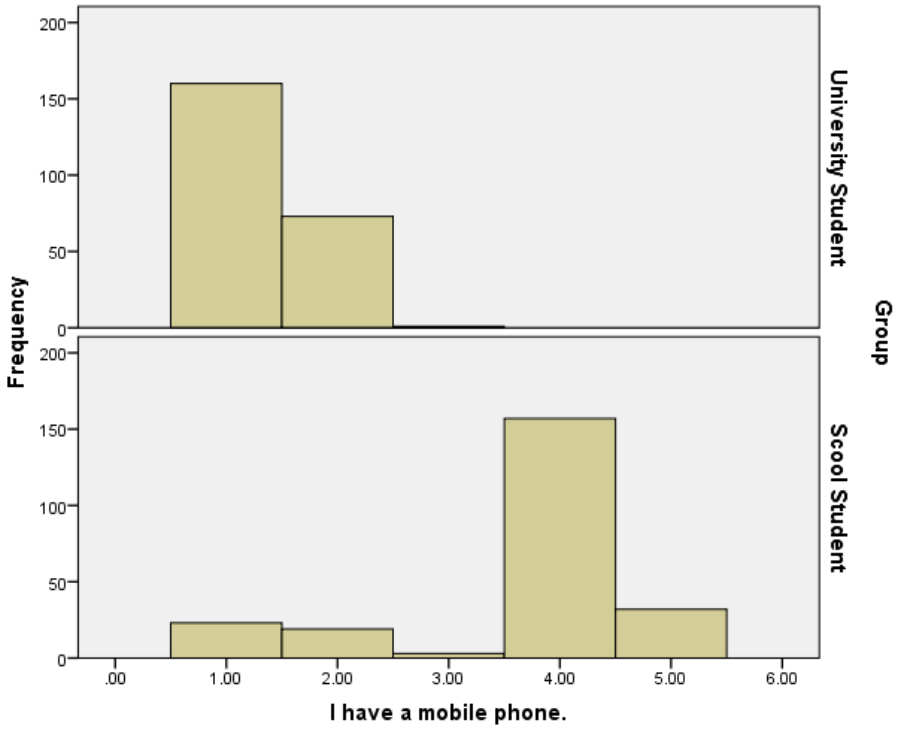
Mann Whitney U test was applied to find out the comparison of the responses of university student vs school students. For this analysis, we had to choose the same number of participants for school and university, so we had to add 25 more participants and their data of the university students.

3.3 Pre-Assessment:

The graph which are mentioned bellow are the results of pre assessment test which gave us an idea of the current perception of females in both settings (i.e. School and University).

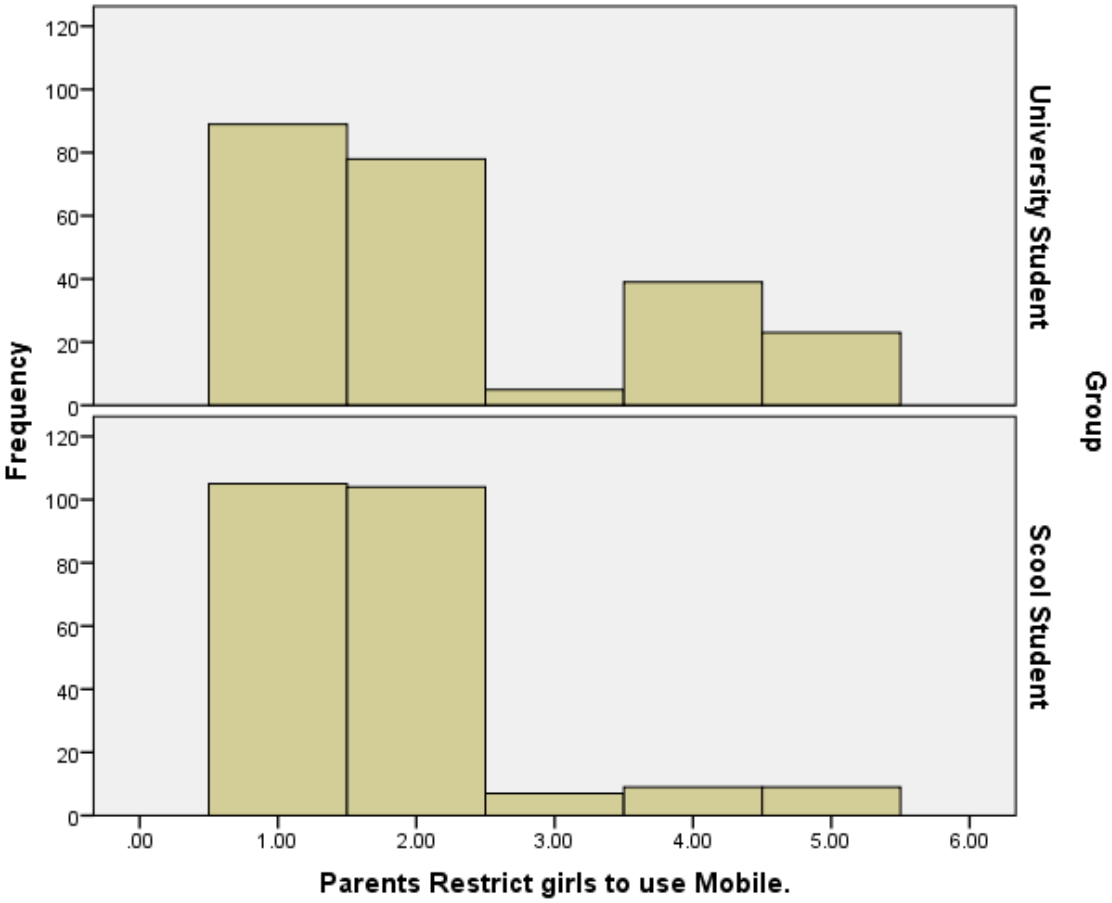


Graph 1: Pre-Assessment – Lack of Access 1



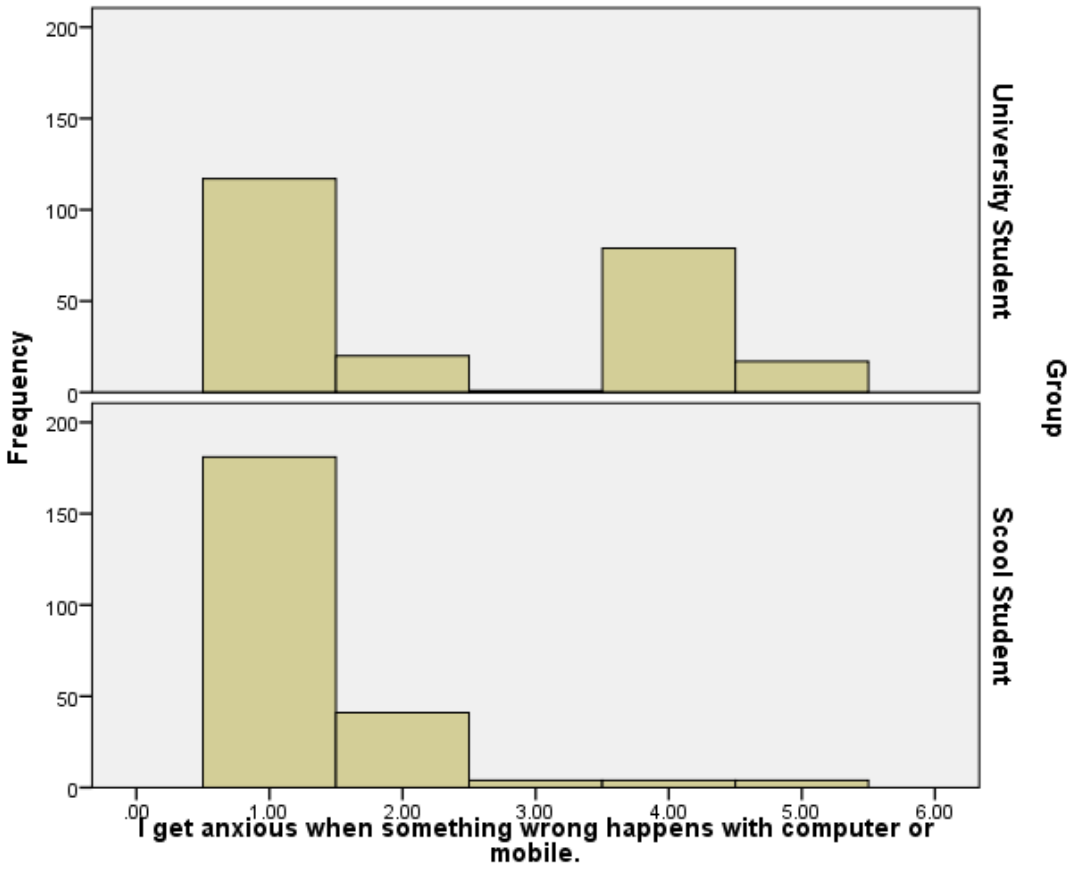
Graph 2: Pre-Assessment – Lack of Access 2

Graph 1 and Graph 2 show that university and school students have access to computers but the graph 2 shows that 66.5% of university students own a mobile phone but 67% of female students in schools have no access to mobile.



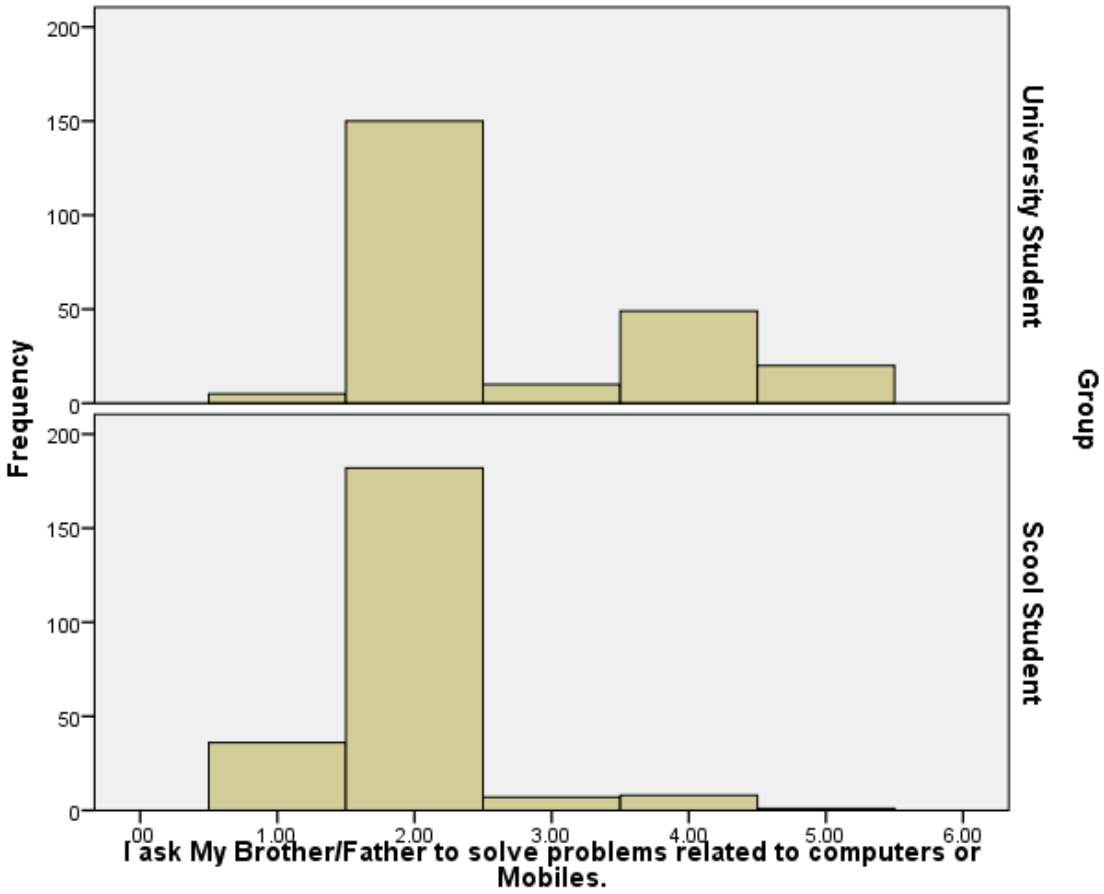
Graph 3: Pre-Assessment – Family Influence

Another important factor that affects girls in choosing career is the support from parent. We tried to find out if the parents restrict girls in choosing ICT a career. As shown in Graph 3, 77% of the females at university level agreed that their parents restrict them to use mobile even when almost all of them own a mobile phone and they are using it.



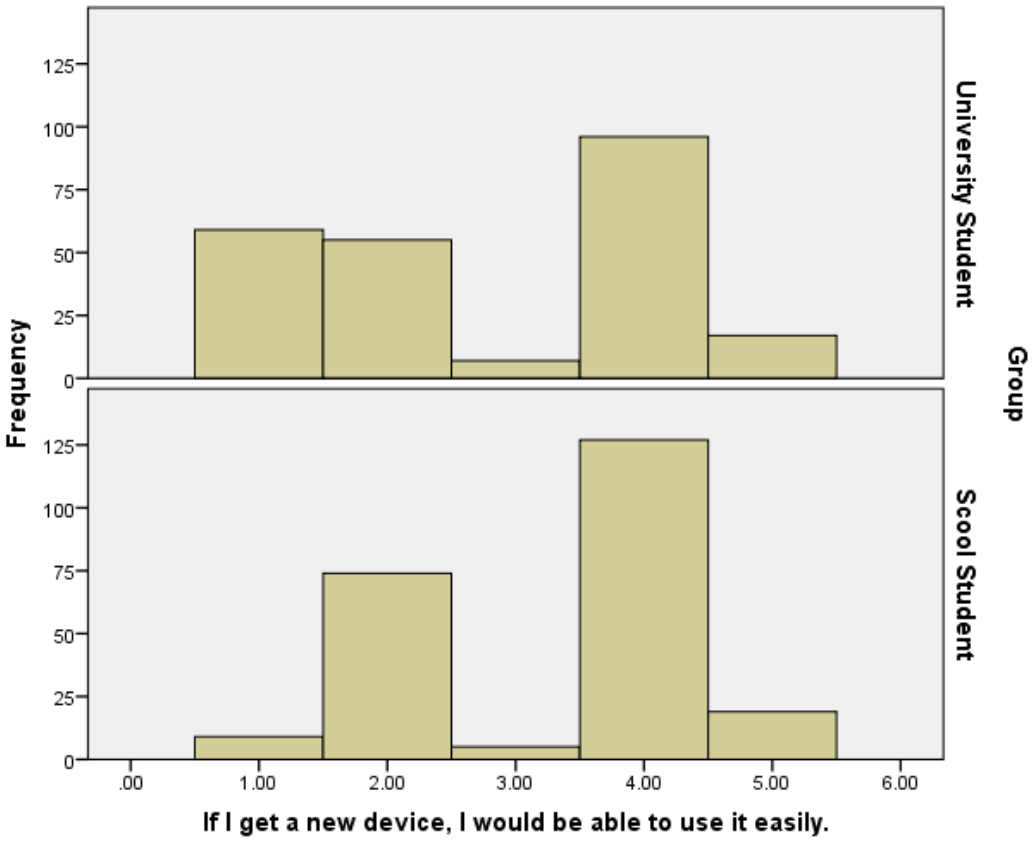
Graph 4: Pre-Assessment – Low Self-Efficacy

Another important factor which affects female is their lack of self-efficacy or confidence that they cannot use mobile or if they are going to use it, they would not be able to use it properly and get it ruined. When students were about their anxiety while using technology, It was surprising that 49.8% of students in university also strongly agreed that they get anxious if something wrong happens with technology but 34% of them disagreed to the statement (that can be seen in Graph 4) which shows that they are confident while using technology on their own. 77% of the female students studying in school also get worried if something wrong happens to their technological devices.



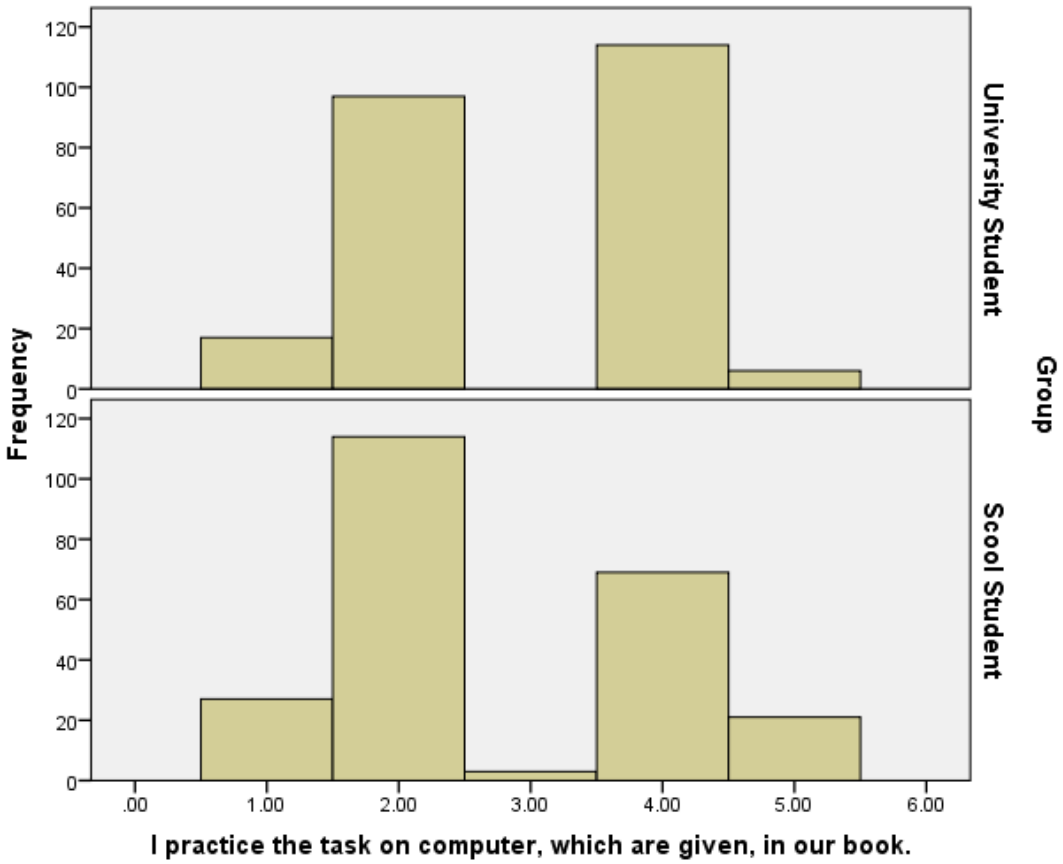
Graph 5: Pre-Assessment – Low Self-Efficacy 2

If something wrong happens to the technical device, 64.6% ask the males (either father or brother) for help instead of trying to solve the problem on their own same is the case with 77.8% of the female participants from schools as shown in Graph 5. 22% of the university participants disagreed to this statement which means that they try to solve it by themselves.



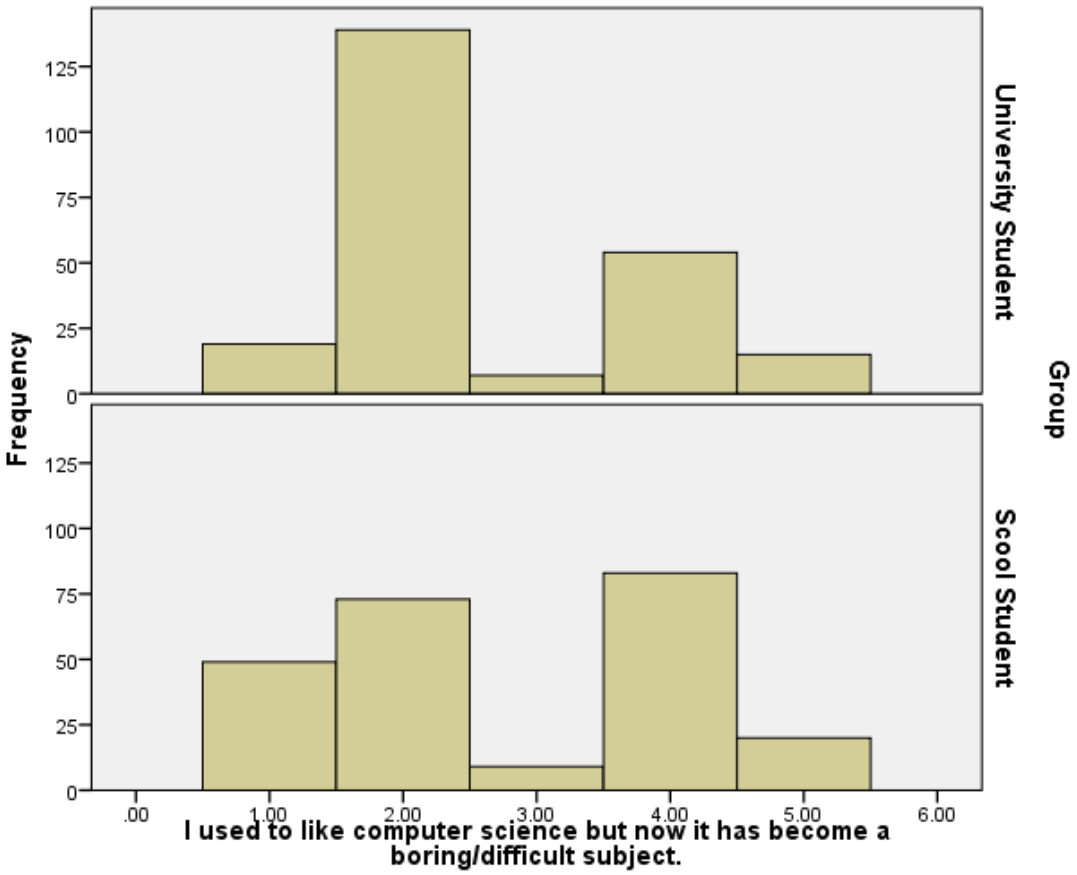
Graph 6: Pre-Assessment – Low Self-Efficacy 3

Using a new device can be difficult for people who are afraid that they would do something wrong. A similar question was added in this questionnaire and results of female students of university showed the mix response. Graph 6 shows that 39.7% of them think that they are not able to use it on their own but the response from the participants from school is very different as 35.9% of them said they cannot use a technical device easily while 25.4% of them said they can.



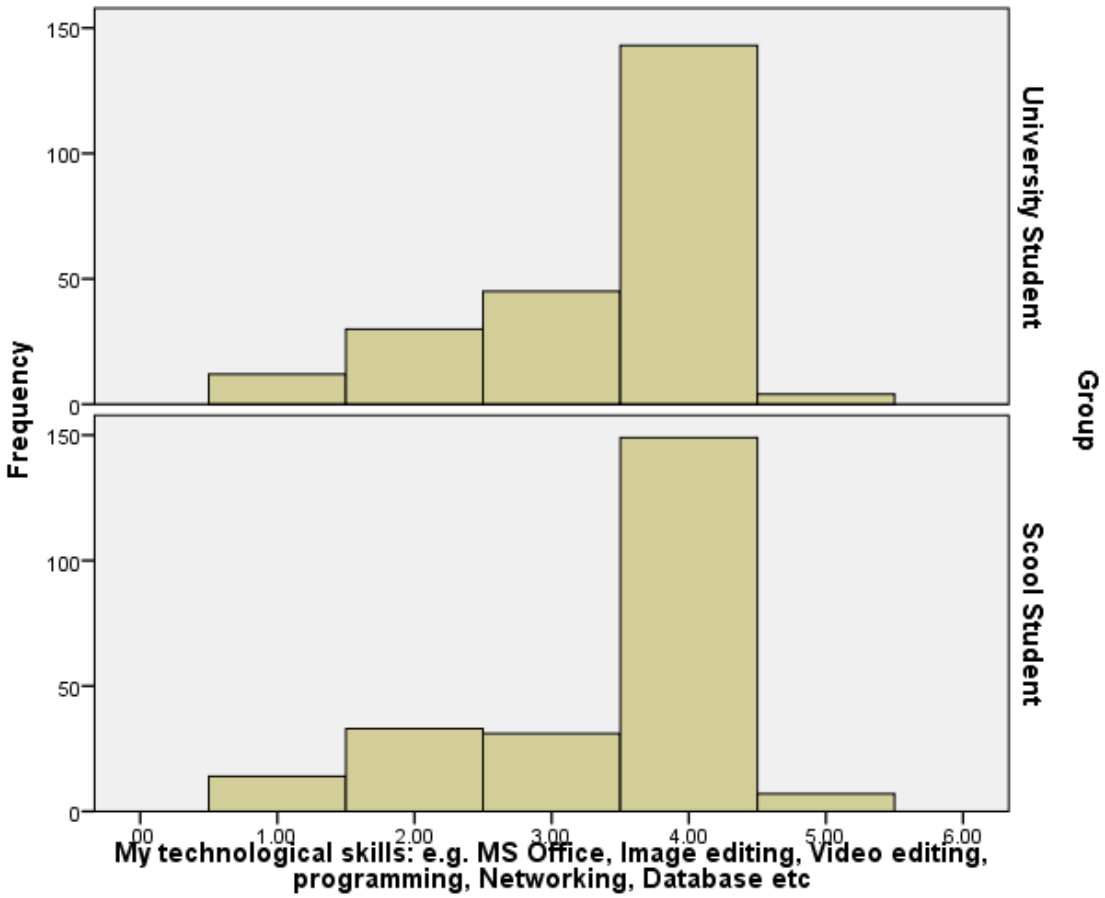
Graph 7: Pre-Assessment – Lack of Access 3

This graph shows that more females in university disagree that they are performing their tasks related to computer i.e. 46.9% of the university participants do not perform their tasks related to computer and at the same time, 43% of the same population agreed that they have used computers to complete the tasks in their textbooks. For higher secondary level, females responded that they have not 48.7% responded that they use computers to complete the tasks but 29.5% of them disagreed to this statement.



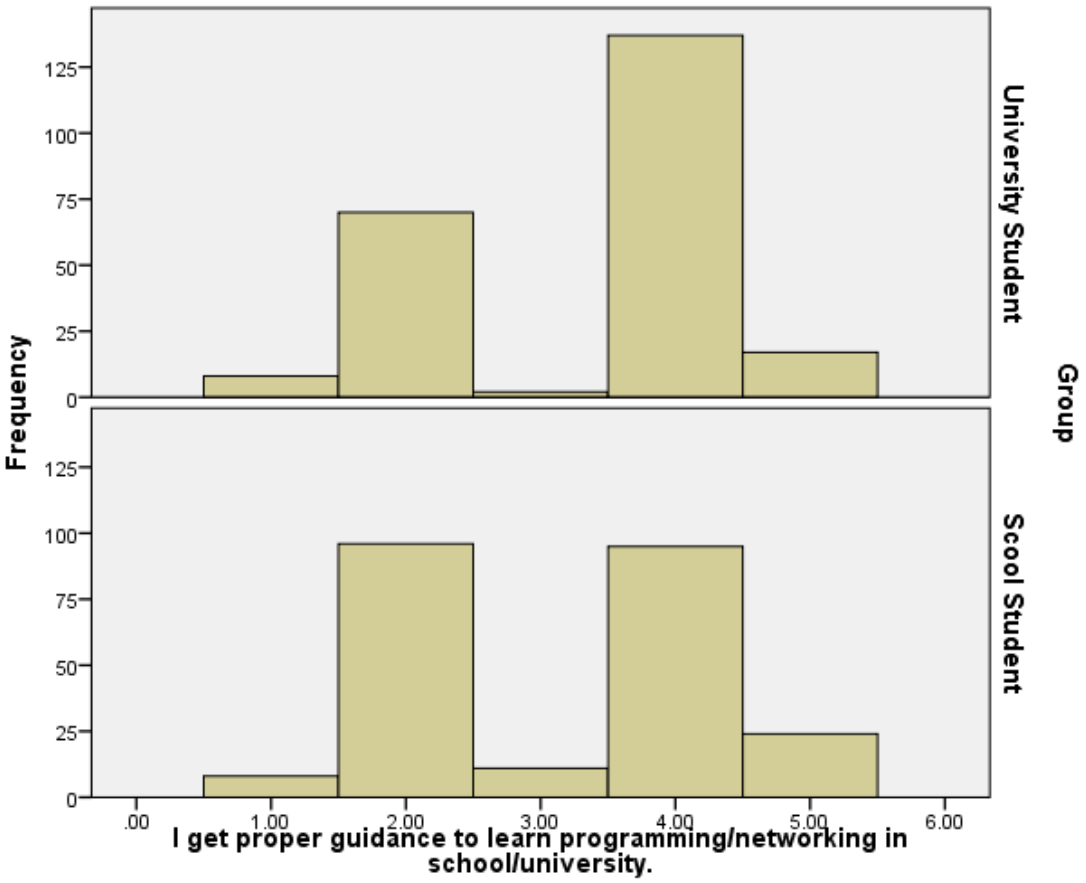
Graph 8: Pre-Assessment – Lack of Interest & Wrong Perception

This statement was very important to find out the decrease in interest of students in computer science as a subject. Graph 7 states that 35.5% of females from school thinks that computer is not a boring or difficult subject while 31.2% of the rest of the participants think that they have lost interest in CS as a subject.



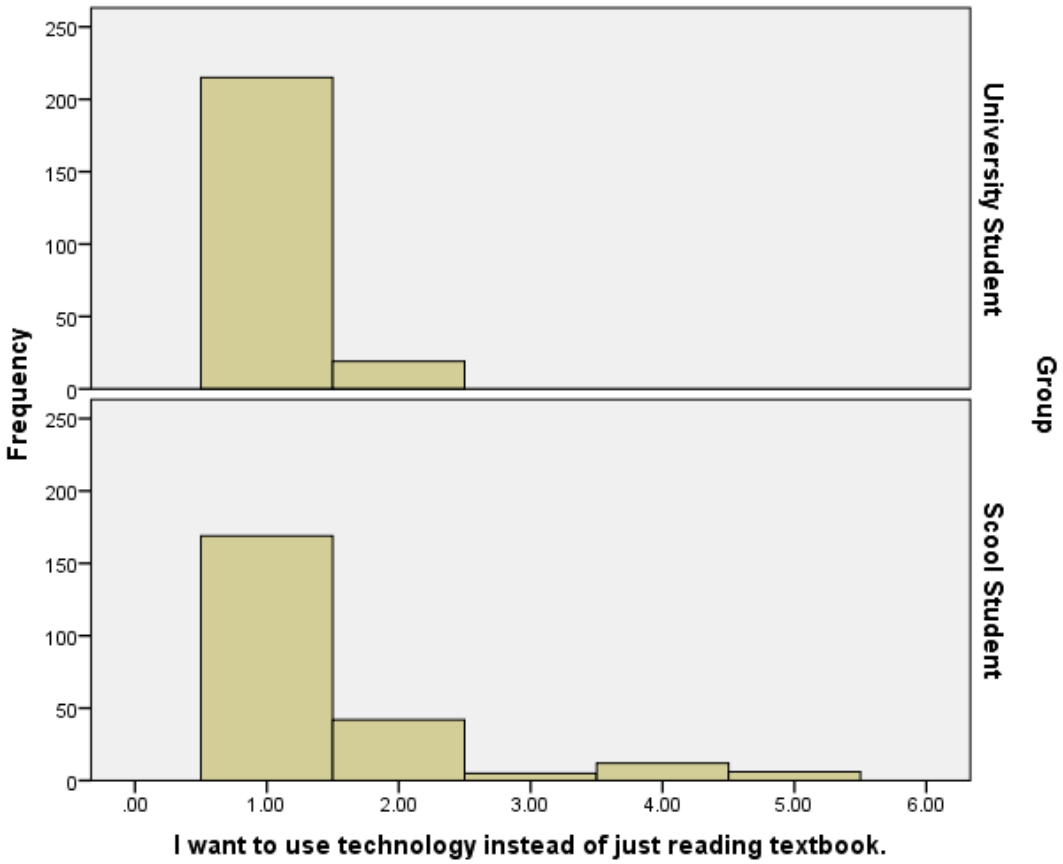
Graph 9: Pre-Assessment – Low Self-Efficacy 4

Basic technical skills are very important in 21st century. If we talk about the job market, these skills e.g. MS Excel, MS Word and MS power point are mandatory. So, a statement was added in the questionnaire asking the technical skills levels from all the participants and their Reponses and comparison of Females from university and school can be seen in Graph 8. 63.7% of Females from school and 61.2% of university students said that they have bad technical skills. This factor is affecting a lot of girls in choosing ICT and a career and the reason for increasing gender gap.



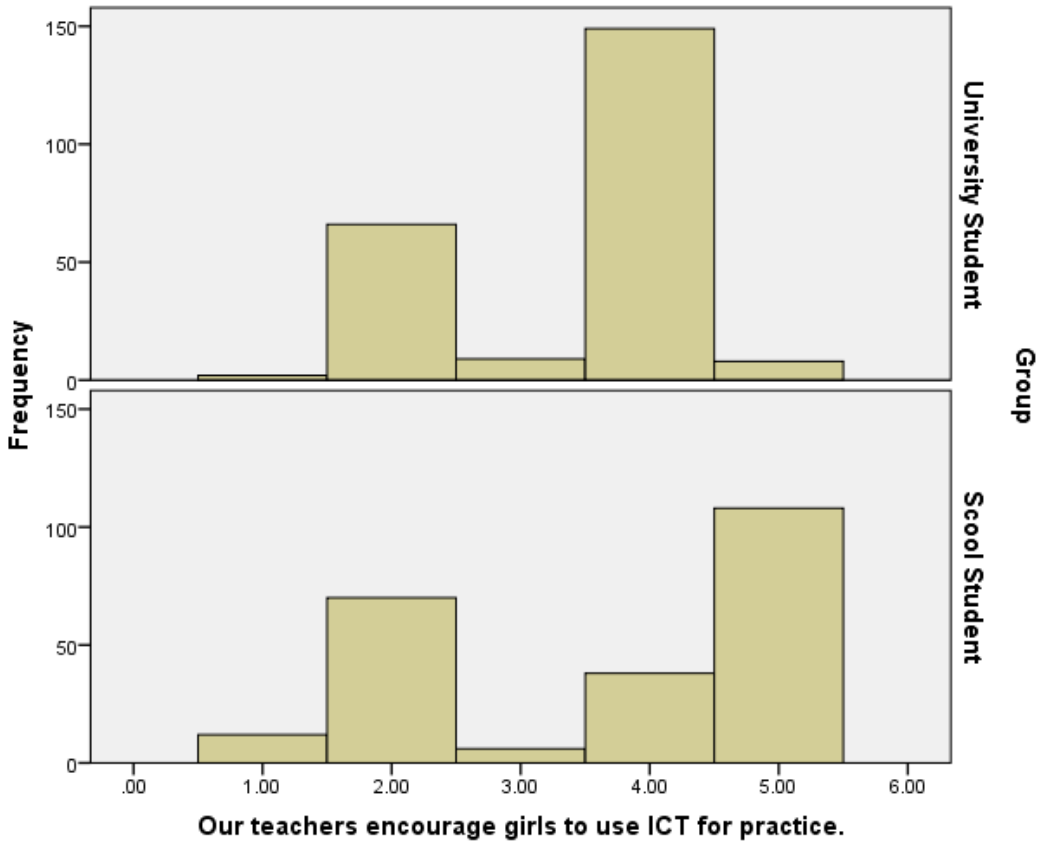
Graph 10: Pre-Assessment – Influence of Learning Environment

Programming and networking are core courses in IT and CS, but they are also creating a huge gender gap in the field of technology. Females in school (40.6%) said they get guidance but 41% said they do not get any kind of help related to programming or networking or other related subjects. 56.9% of university students also said that they do not get any help in learning these subjects and this can also be seen in Graph 9.



Graph 11: Pre-Assessment – Lack of Motivation/Interest

Graph 10 shows the result that 91.4% of university students and 72.2% of female students from school level strongly agreed that they want to use technology instead of just textbook that is the traditional method and popular method of teaching in Pakistan.

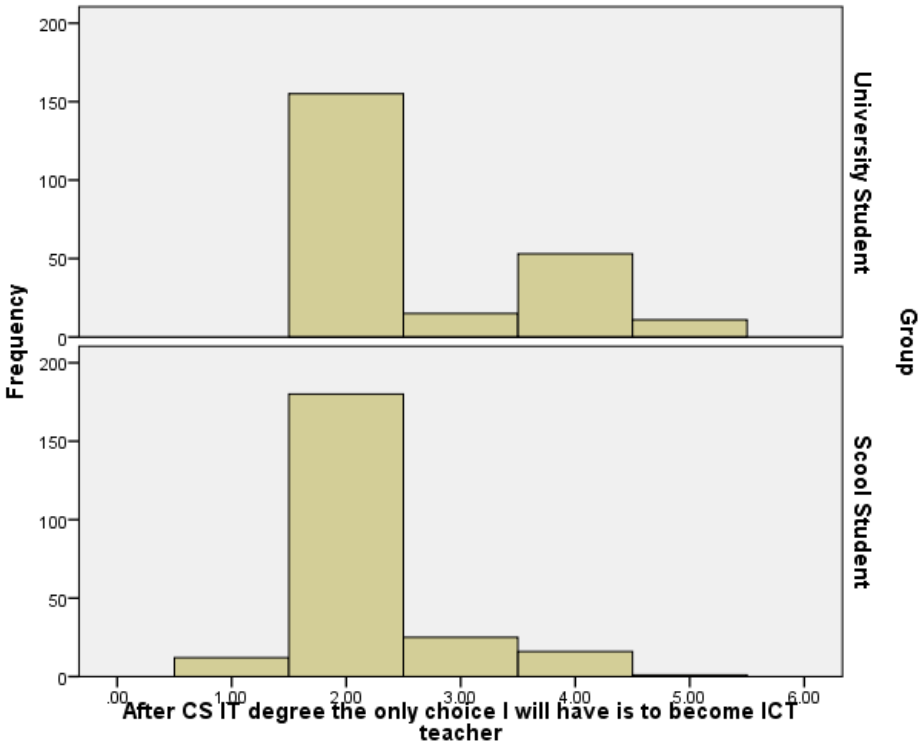


Graph 12: Pre-Assessment – Influence of Learning Environment/Society

Teachers also play a very important role in a student's life and their career. 65.1% of university students responded that they do not get any guidance from their teachers and they not even encouraged by the teacher to choose IT in future. According to the Graph 11, 46.2% also disagreed to this statement while 29.9% said that they were encouraged by their teachers.

Graph 13: Pre-Assessment – Influence of Society 2

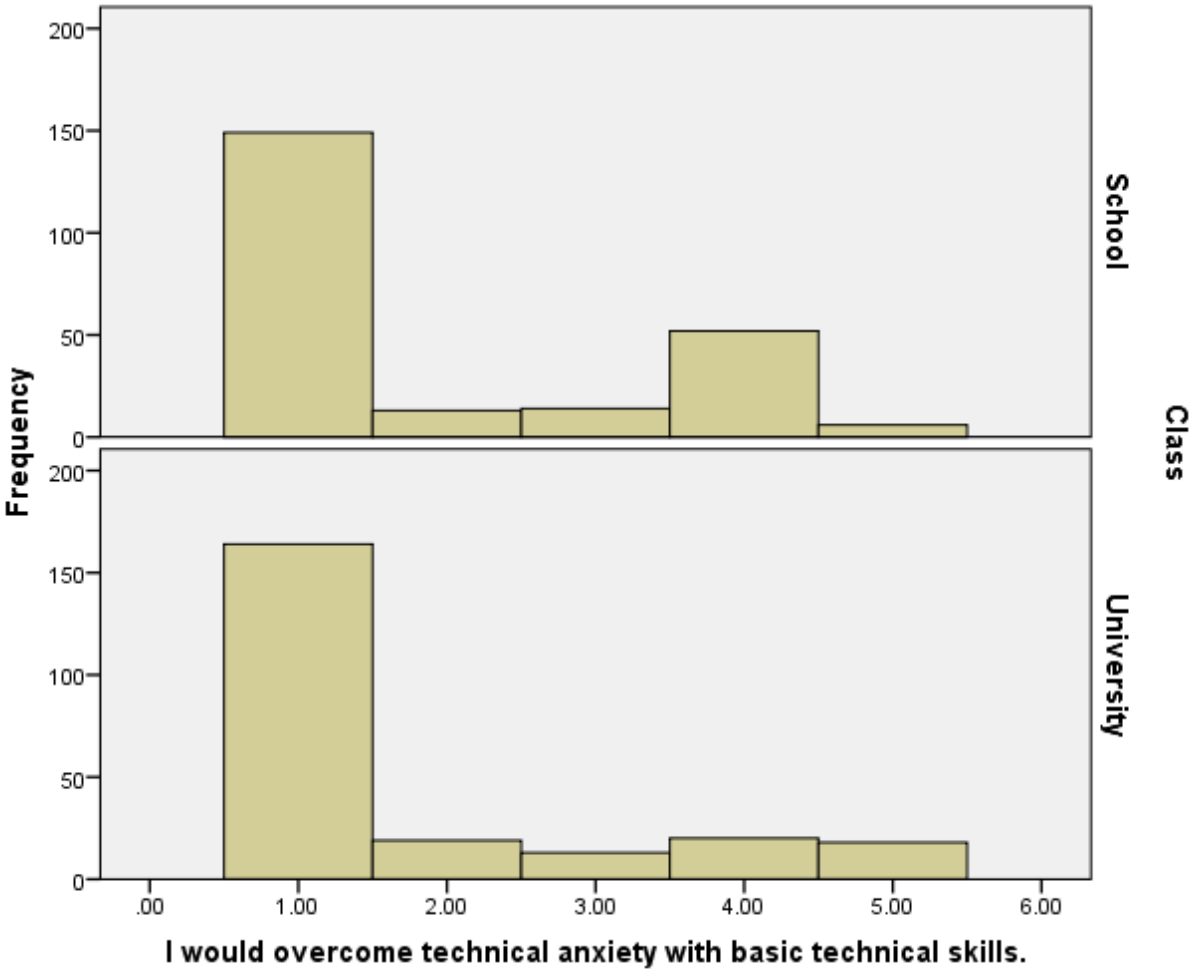
Graph 12 shows the results that 77.2% of the female participants from university agree that tech market is male dominant but 68.7% of female participants from schools neither agreed nor disagreed which shows that they do not have much exposure to tech market but the ones in university has more exposure and experience.



Graph 14: Pre-Assessment – Lack of Awareness

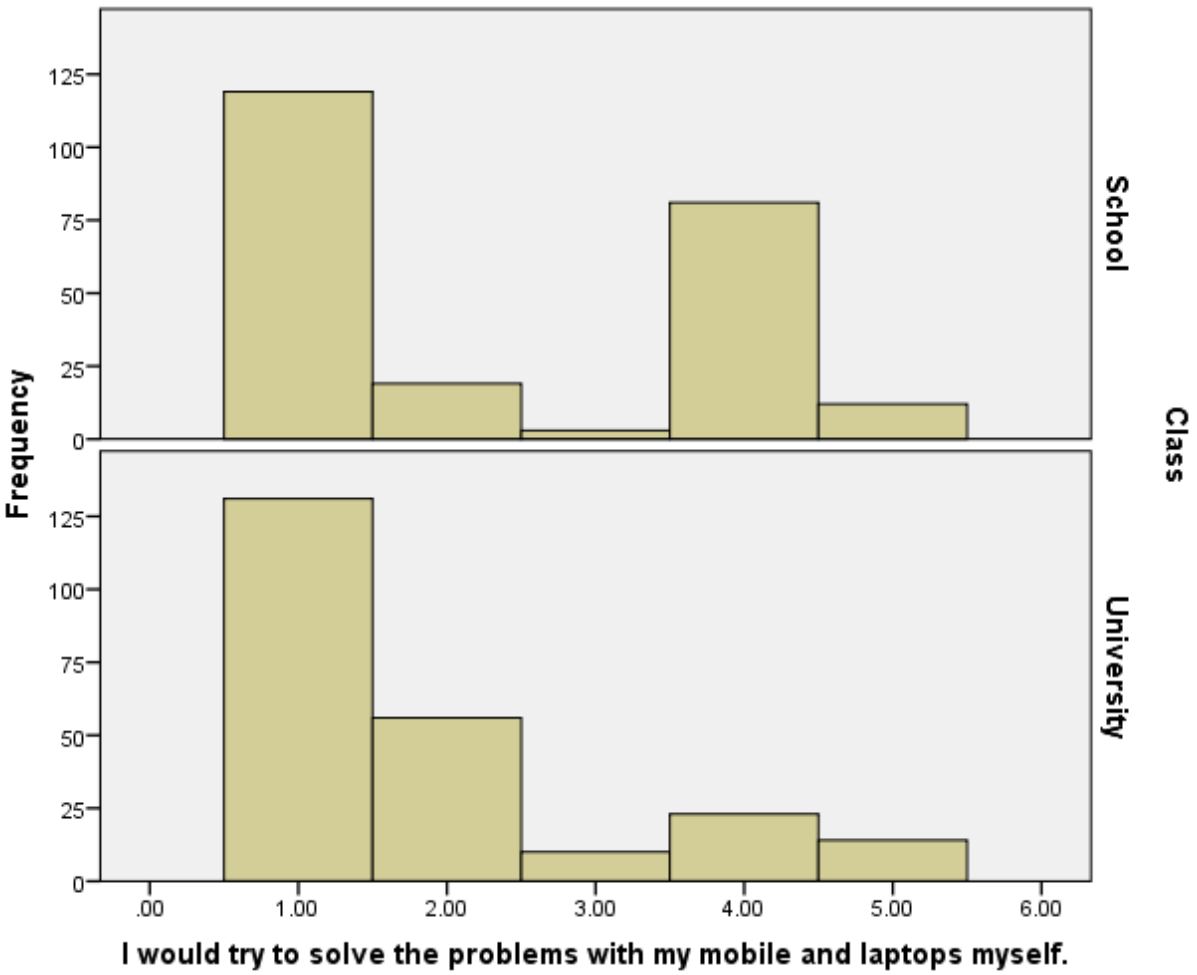
I have done my bachelor's degree in IT and we were 51 classmates (13 females and 38 males) but I found out that only 3 of them are working in the field of IT rest of the classmates have joined teaching as a profession. It is considered that teaching is the easiest job so if someone cannot find a job, he/she becomes a teacher in Pakistan. As shown in the Graph 13, 72.2% of females from school and 76.9% of females from university also agreed that the only profession after CS or IT is to become a teacher.

3.4 Post Assessment:



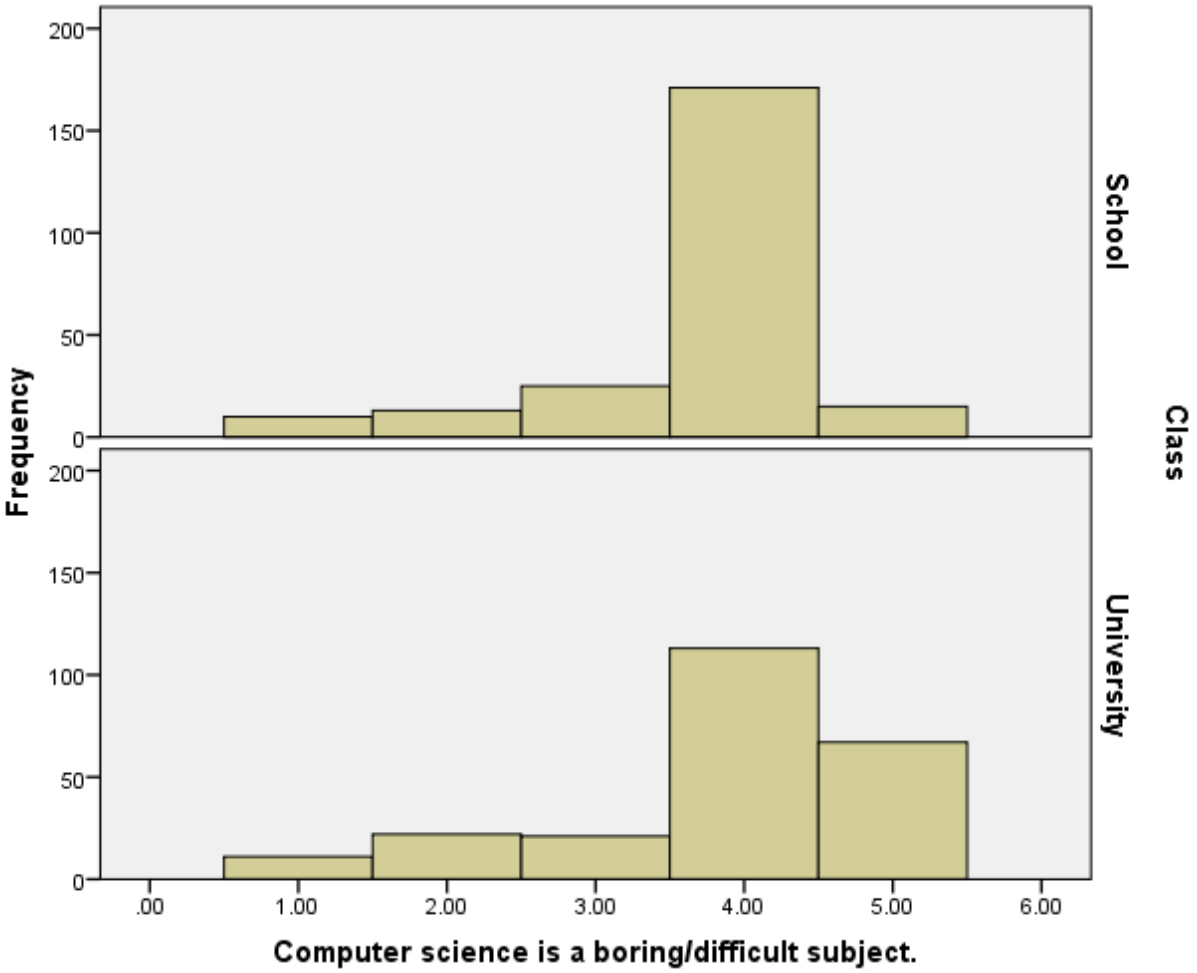
Graph 15: Post-Assessment - Self Efficacy

In pre-Assessment, technical anxiety came up as an important factor that shows the lack of confidence of girls while using computers/Laptops/Mobiles. 49.8% of the participants from university expressed in pre assessment that they get anxious while using technology but if we look at the post assessment Graph 15, then we can see that 70% females participants from university and 63.7% from schools are confident that they would overcome the anxiety with basic learning skills. 22% of the female participants from schools still think that they would not be able eliminate the technical anxiety even if can learn basic skills.



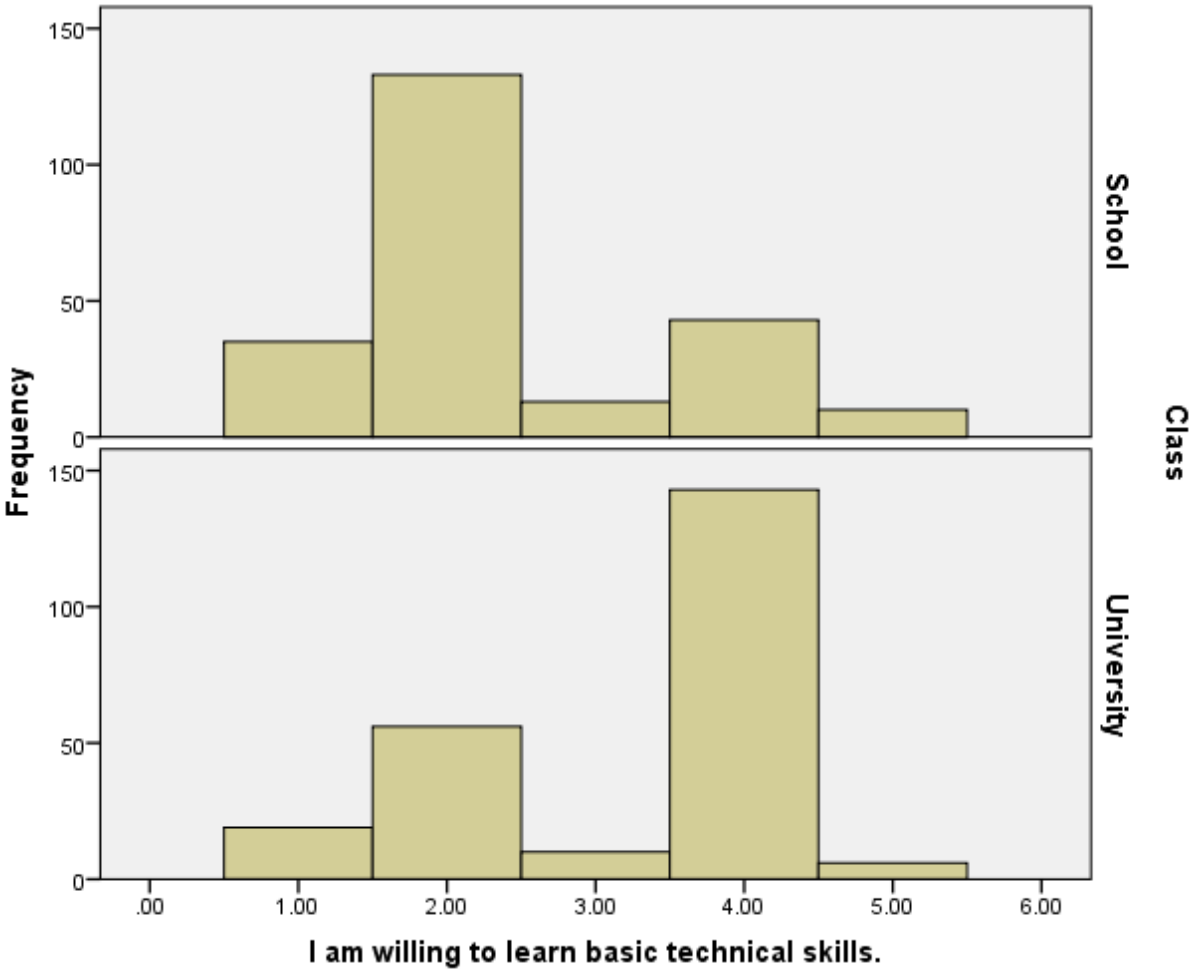
Graph 16: Post-Assessment - Self Efficacy 2

It is important for females to use technology on their own and solve their problems. Pre assessment showed that girls ask their brothers to solve all the problems related to their mobiles and computers. 56.9% of female students from university agreed that they would try to solve their problems. Half of the female participants also agreed to this. But if the results of Graph 16, are considered then we can also find out that 34.6% of the rest of the females from school did not show the interest in solving their own problems.



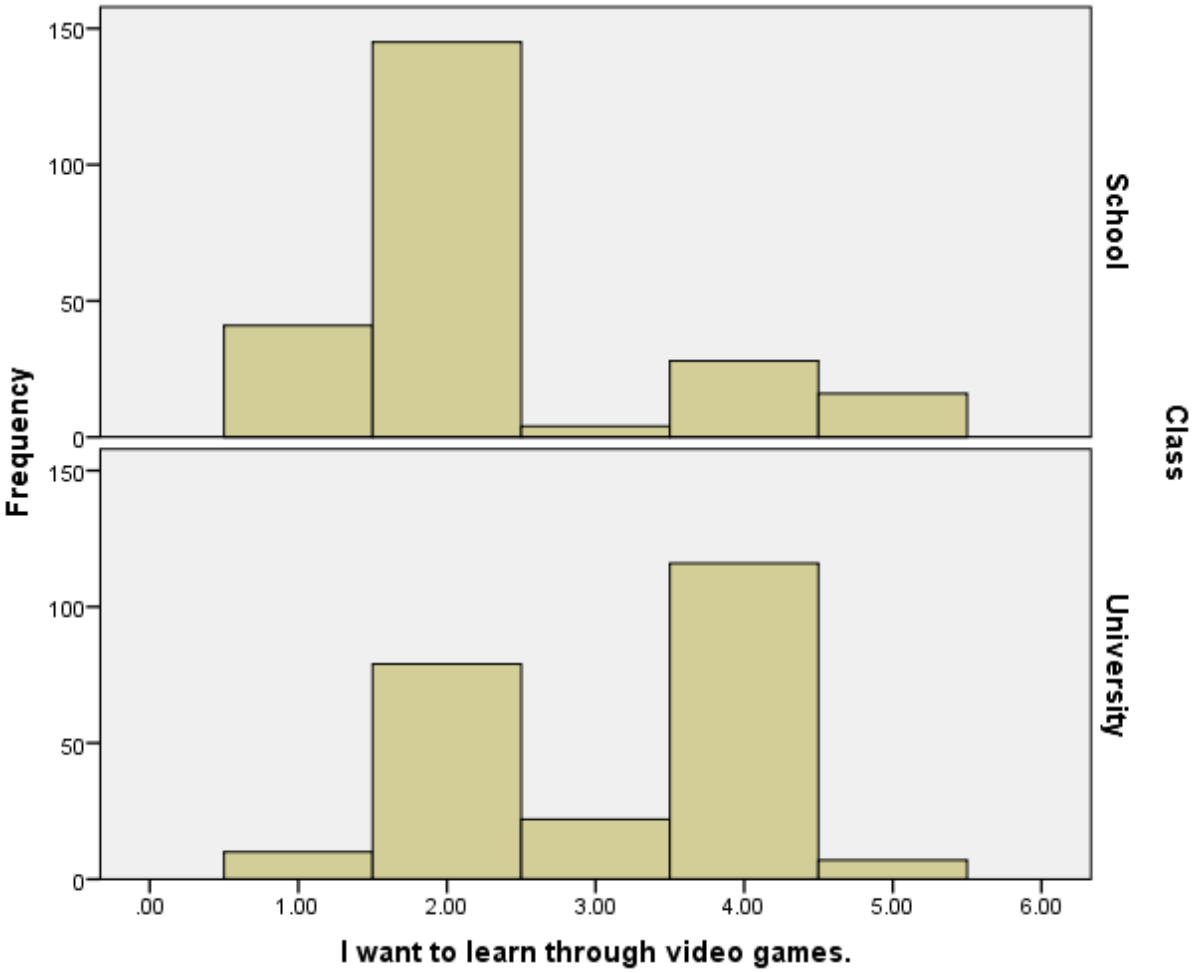
Graph 17: Post-Assessment - Motivation

CS/IT are considered as dry, boring and difficult subjects and we got the same results in our pre assessment that support this statement about the subjects. Considering the results of Graph 17, we can see an almost same result that 73% females from school and 48% from university do not think about CS/IT as a boring subject that gives us a hope to reduce the increasing gender gap in IT.



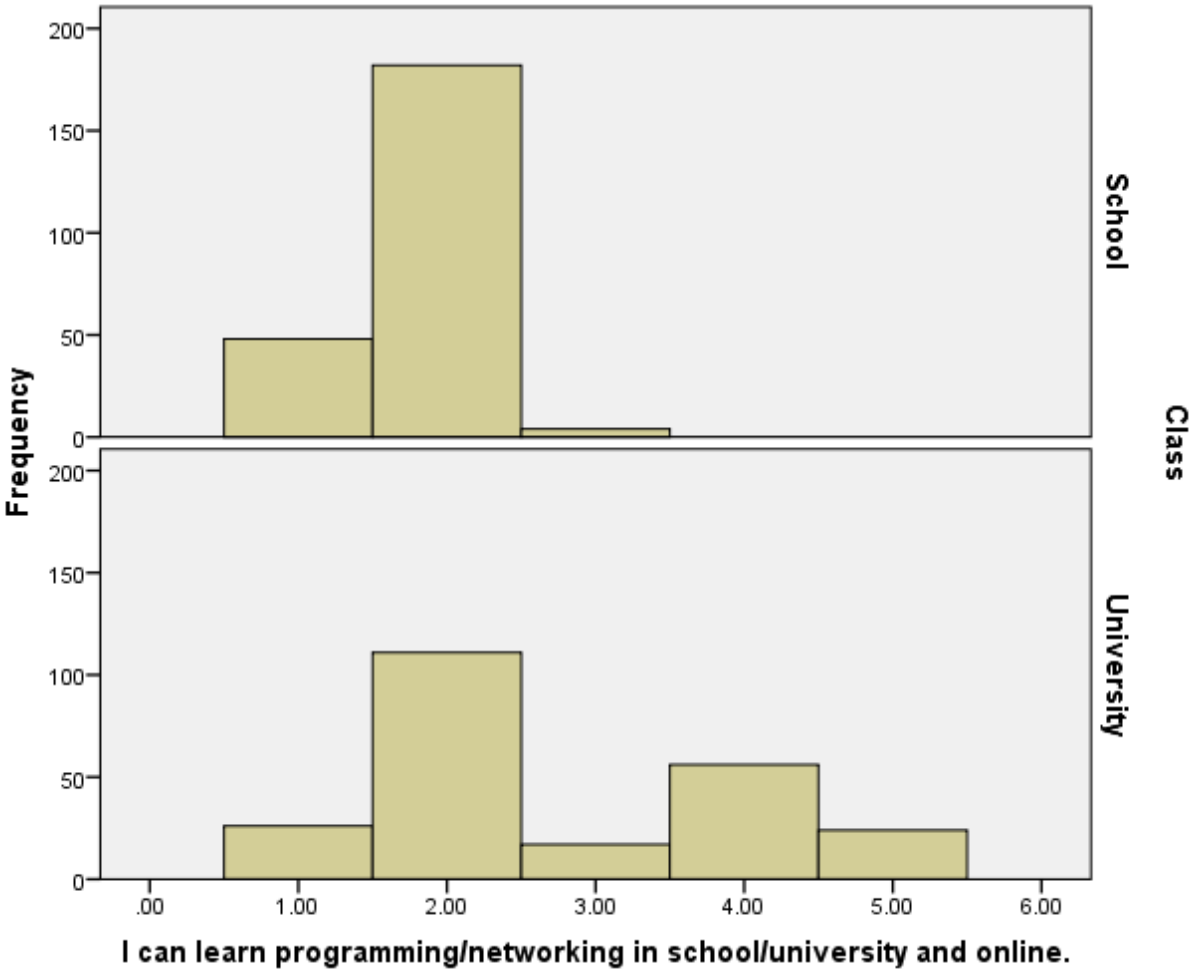
Graph 18: Post-Assessment - Self Efficacy 3

Although, females showed positive attitude towards the use of technology on their own but when they were asked about the willingness to learn technology, 60% of the female participants from universities did not show any interest to learn the basic skills. Although, 56.8% females showed the enthusiasm that they want to learn these skills. This shows that students, who are at a higher level of education, gradually lose interest in learning ICT.



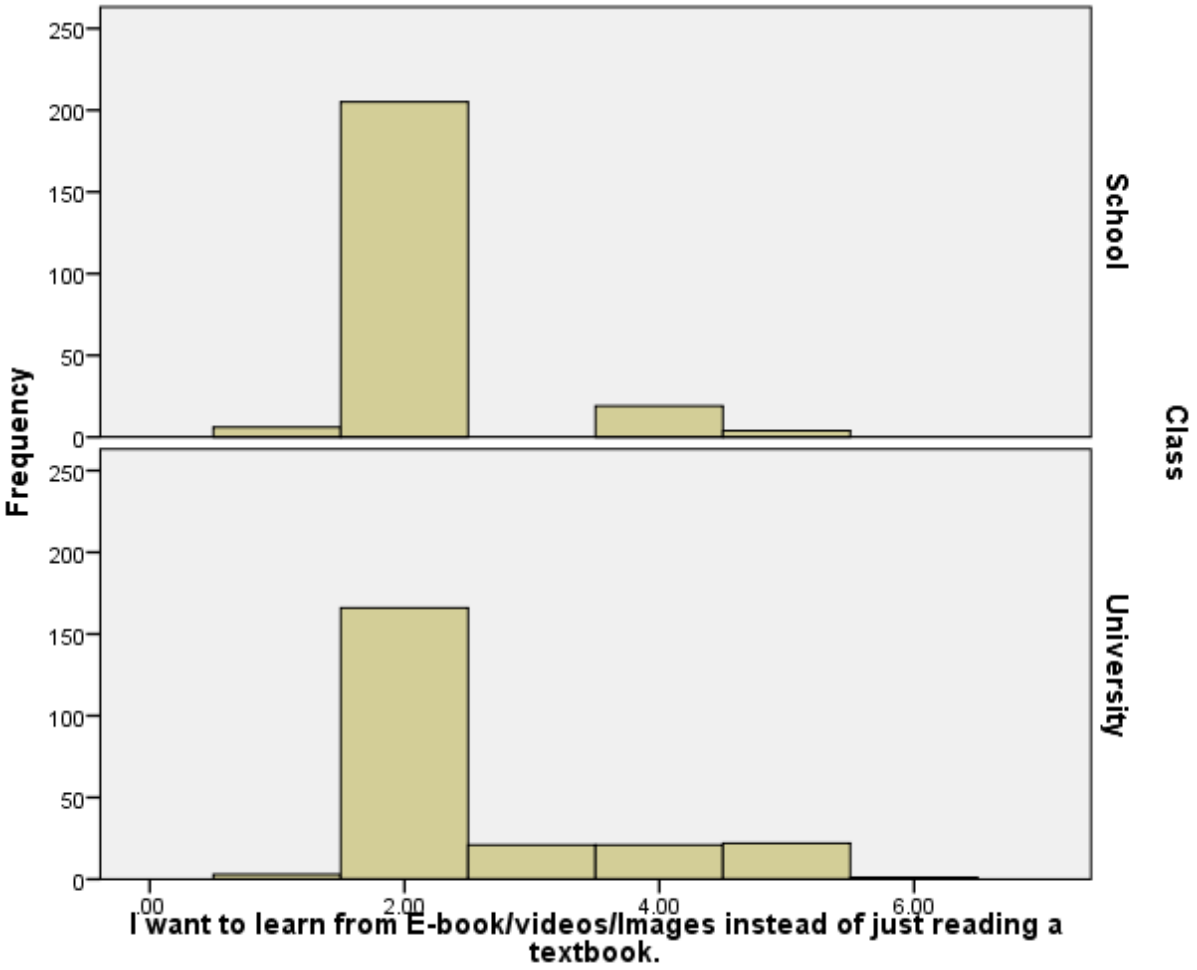
Graph 19: Post-Assessment – Motivation 2

The graph ------- shows that girls in the schools are inclined towards learning with different medias like video games. They can play many kinds of video games, Video lectures, assessments and quizzes through online Learning Management Systems like BYJU, Khan Academy, Learn Smart Pakistan. But university students had a mixed response, 49% of them did not like the idea of learning through video games and 34% of them showed willingness to it. High schools content is not a focus of educational video games developers but there are many other online resources like EDx, Coursera and Udemy etc. where high schools content is available, and it has a very good quality as well.



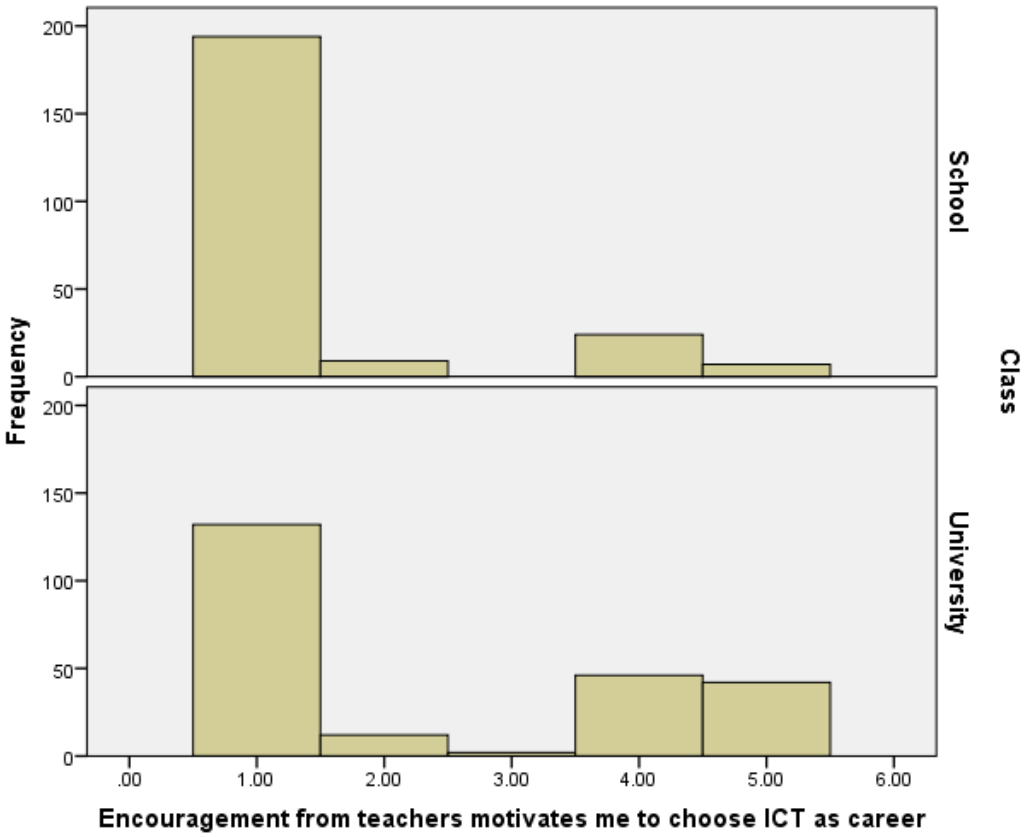
Graph 20: Post-Assessment - Awareness

E-learning and M-Learning are the latest and most important way of learning through online resources. During the intervention, Students were told about the trend and importance of online and distance learning which is increasing day by day. We also have a lot of simulation software which helps in learning better. For females in Pakistan, this is a golden opportunity as they can get themselves enrolled in the distance learning courses to complete their education. This graph showed that 77.8% of females from school accepted that they can learn programming and networking through online resources but the females from the university showed a mix response, 47% of them agreed that they can learn but 23% disagreed and 10% strongly disagreed to the concept of learning programming and networking on their own through online resources.



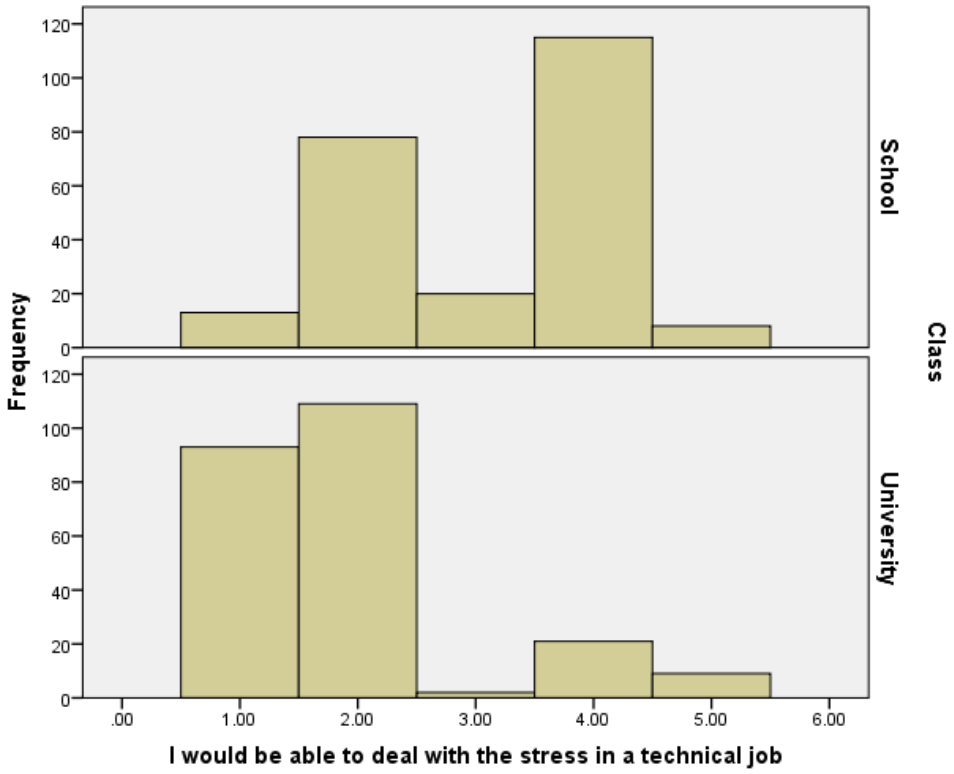
Graph 21: Post-Assessment - Motivation 4

Although females from university showed less interest towards learning through video games/online resources but at the same time, they were inclined towards learning through eBooks. In traditional learning environments, Students had the choice of learning with a book which was available in hard copy and they could not learn from any other material. E-books these days are customized and inclusive. It has features which can help even students with learning difficulties. These eBooks, videos and online assessments can help students in learning. Students were provided a website/blog which had a few stories of female role models like Arfa Kareem, Jahan Ara etc. who are working in the field of technology in Pakistan.



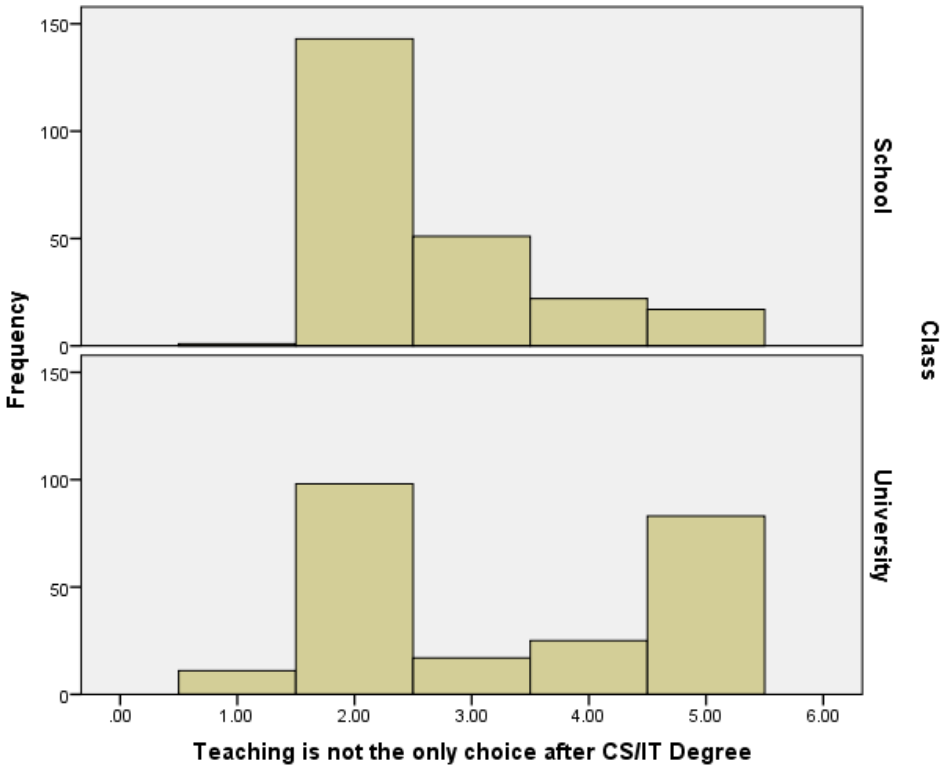
Graph 22: Post-Assessment - Learning Environment

Teachers play a very important role in a student's life. If we consider a teacher as an advisor/mentor, then we expect them to encourage and motivate students to learn in every possible way. 56% females from university agreed that their teachers encourage them to choose ICT as a career but 19.6% and 18.2% of the rest of the females disagreed and strongly disagreed respectively.



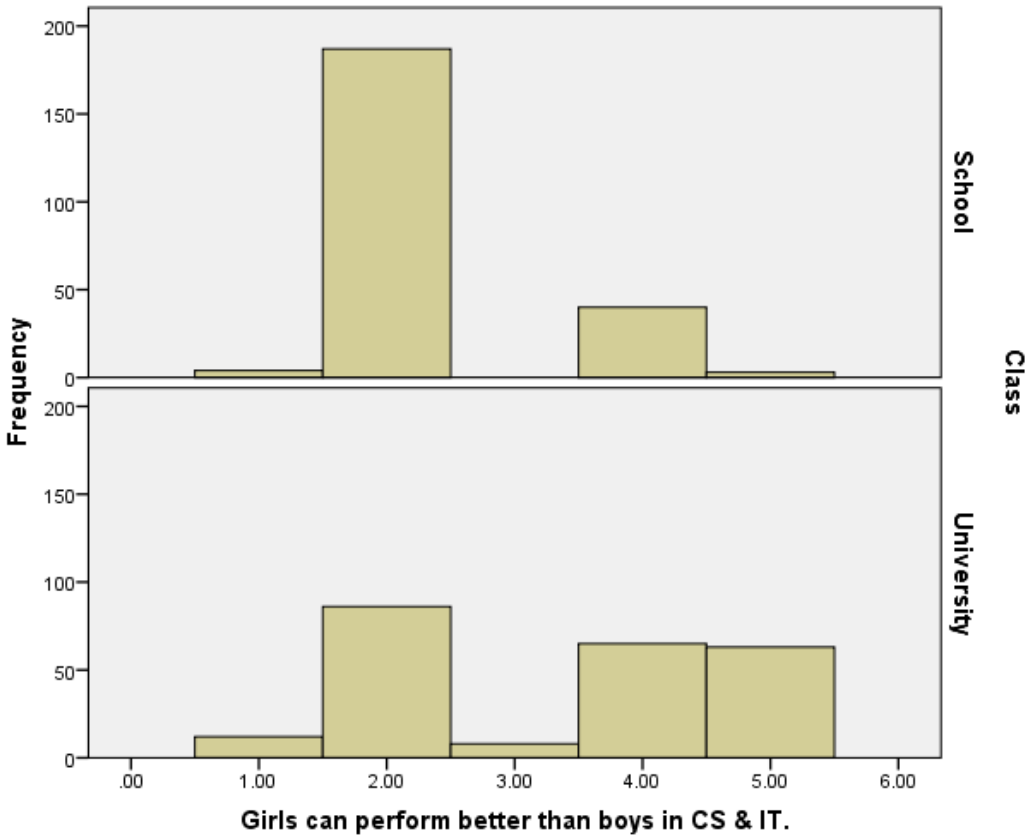
Graph 23: Post-Assessment - Motivation 5

A job comes with a lot of stress and it is most important to know how to deal with it. Students in pre assessment showed that they do not want to do office job as it is difficult for them to work in such environment with a lot of stress. Participants from school had mixed views about it as 33.3% agreed to this statement while 49.1% did not think that they would be able to take stress during the job. Almost all the female participants from university (46.6% agree & 39.7% strongly agree) got the self confidence that they would be able to bear the stress they would face if they do a job related to technology.



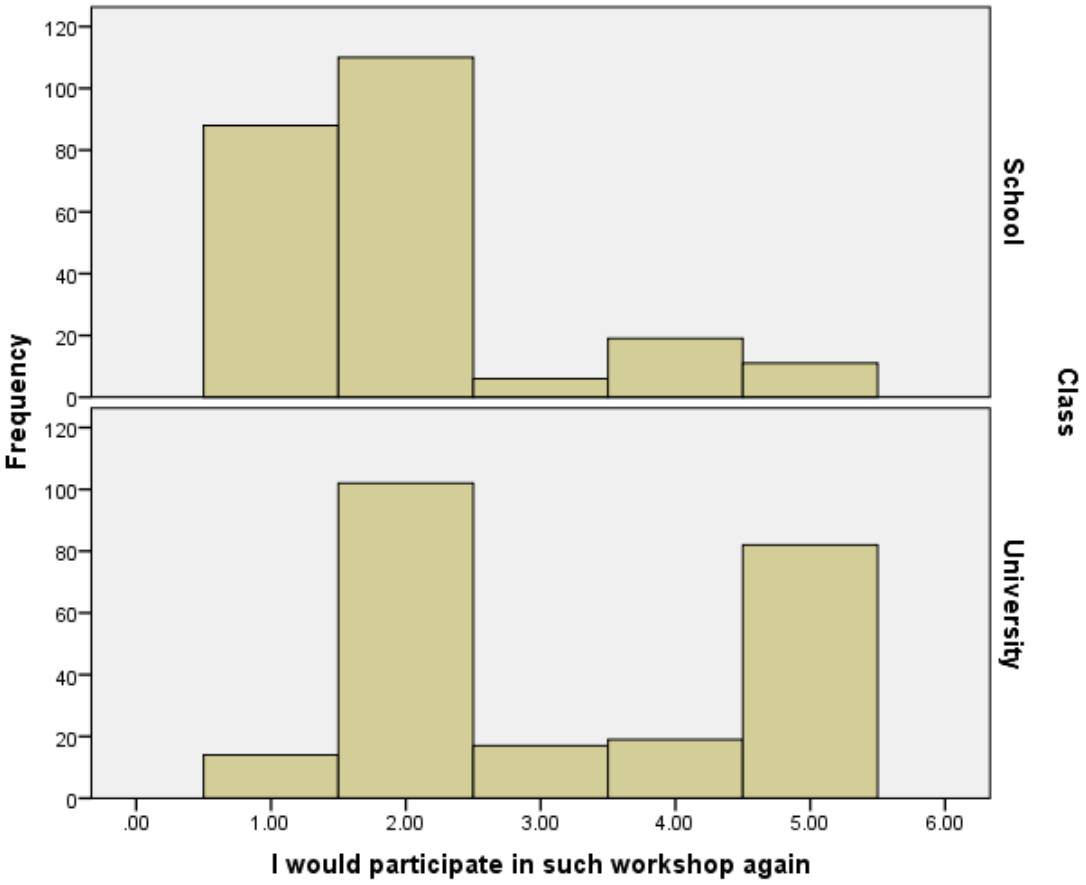
Graph 24: Post-Assessment – Awareness 2

In Pakistan, Teaching is considered the only secure job. CS/IT are the degrees that can be pursued as a career. In pre-assessment result, participants showed that they would only have a choice to become a teacher after studying IT. But after the training sessions, A change in the perception of 61% females from school can be seen as they thought that teaching would not be the only choice for them in future. But this is not the case with females' participants from university level. They had mixed response, 35.5% of them still agree that there is no other choice than becoming a teacher after CS/IT degrees.



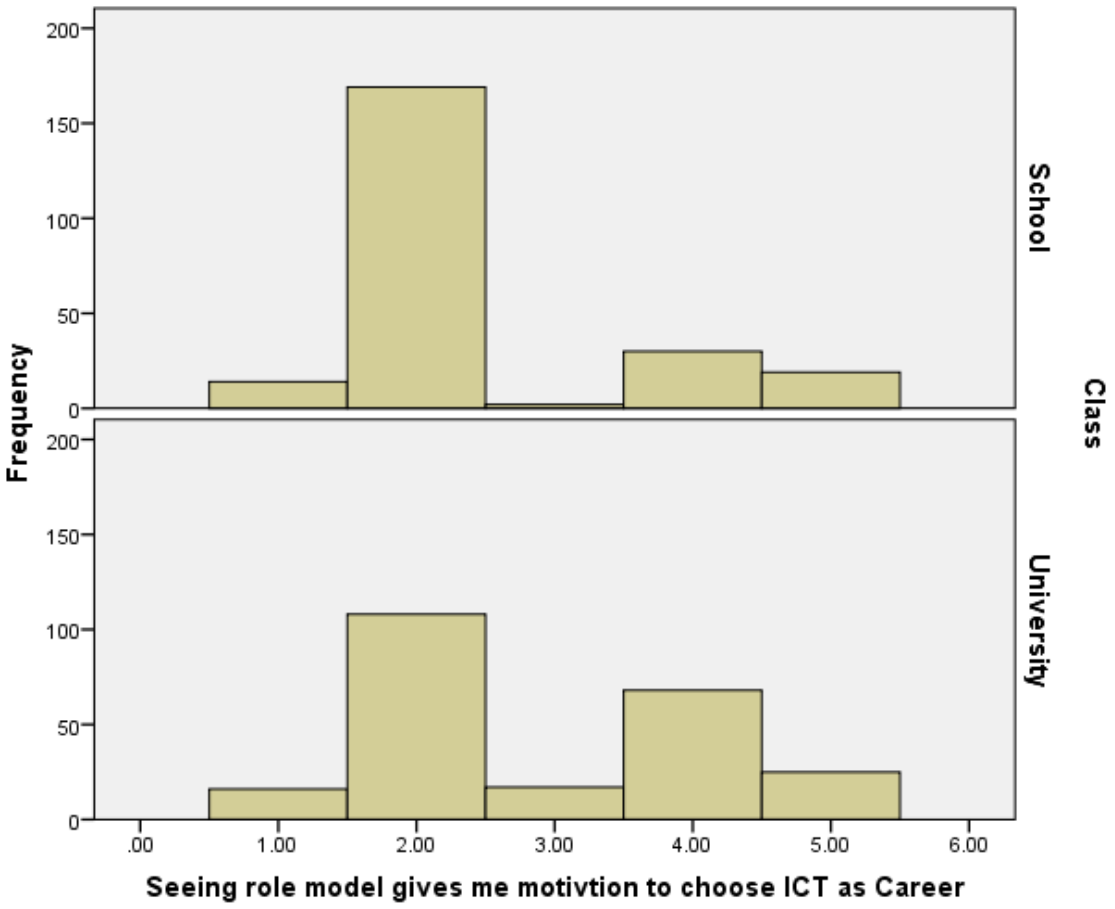
Graph 25: Post-Assessment - Self Efficacy 3

In pre-assessment results, Females showed a misconception that they can not perform better than girls. By looking at the graph ----- it can be seen that university students' perception was not changed as almost 52% of them think that boys are better than girls in the field of technology. There is a huge difference between school students and their perceptions before and after the training sessions. Although 36.8% agree that females can perform better than girls.



Graph 26: Post-Assessment - Motivation 4

These kind of training sessions are very important for girls and when they were asked about their interest in such training, the school girls showed a great interest as 84% of them showed positive response to participate in such workshops in future while 35% female participants from university did not want to attend any workshop related to technology in future. This gives us a clear idea about the hypothesis being true that females gradually lack interest in learning technology and related skills.



Graph 27: Post-Assessment - Society/Environmental effect

Another important factor that affects females in choosing career is seeing role models in their locality. During the training sessions, two of the women working in tech market were invited and they shared their experiences with students. 72.2% females from schools and 46.2% from university agreed that they feel more motivated to choose IT when they see a role model working in the same field. At the same time a few female participants from university did not agree to this statement.

Chapter 4: Results

There is a strong relationship between female's access to technology and their career choices. Choice of career also depend upon the female's perception. Females, at initial level of education, have an enthusiasm to learn technology but they do not get access and guidance which creates a leaky pipeline in tech market. Students when they reach university levels, they do not show any interest towards learning new skills, but they also have more exposure and experience to work with the technology. Role models, encouragement from teachers and family support also prove to be a positive factor in females' choice of IT professions.

Chapter 5: Conclusion:

There is a strong relationship between the societal norms with the access of technology and its use as parents restrict their daughters from using technology which keeps them from developing a confidence to use it. Female students who are studying in secondary school level shows more interest and motivation towards learning ICT but the females from university did not want to learn learning basic skills or even attending any workshop to learn the importance of technology. Girls in school get inspiration from teachers and role models while the girls in university do not get proper guidance and encouragement to learn or pursue ICT as a career. Learning environment has a huge impact on females and their career choice so it should also be considered.

5.1 Discussion of findings

The purpose of this study is to investigate the factors that influence girls in Pakistan in choosing ICT. The purposed findings of this study are in line with the (Eck, Joseph Appianing and Richard N. van, 2015, pp. 28-56) who identified that parents and sibling's perception towards ICT is the reason that girls lack motivation in choosing ICT. Findings also showed that society and

stereotypes like ICT is not for girls are the reasons for this increasing gender gap in education. The proposed findings are evident for the findings of (Cynthia C. Fry, Jessica Davis & Yasaman Shirazi-Fard, 2008) also stated that girls taking part in activities related to STEM are beneficial for developing intrinsic motivation girls.

5.2 **Future Research**

This study used standardized instrument for quantitative data collection which has a known validity and reliability so the result will be valid and generalizable. The findings of this study helped to know the factors affecting girls in choosing ICT as career, ways to develop intrinsic motivation and to overcome the increasing gender gap in technology market.

This study included a wide range of participants which is helpful to generalize the results. The Instrument was developed according to the context of the participants. The Instrument was developed in English and Urdu for better understanding of the participants. But this study also has following limitations that reaching a diverse range of participants (i.e. age 15-35) was a bit difficult. This research required to include people from different background so it was necessary to develop questionnaire in a language which they can understand. This study included only girls and women but considering men and boys will give a new direction to the study.

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Appendix A

Questionnaire:

	Name (Optional): _____ Class: _____ Group: Science/Arts/Computer Science					
		Strongly Agree بہت زیادہ اتفاق	Agree اتفاق	Neither دونوں میں سے کوئی نہیں	Disagree اختلاف	Strongly Disagree بہت زیادہ اختلاف
Access						
1.	I have a computer at home. میرے گھر میں کمپیوٹر ہے.					
2.	I have a mobile phone. میرے پاس ایک موبائل فون ہے.					
3.	I use Computer phone at home. میں گھر میں کمپیوٹر / موبائل فون استعمال کرتی ہوں.					
4.	I have a computer lab in schools. میرے اسکول میں کمپیوٹر لیب ہے.					

5.	Parents Restrict girls to use Mobile. والدین موبائل استعمال کرنے کے لئے لڑکیوں کو محدود کرتے ہیں.					
Confidence						
6.	I know how to use a computer/mobile. میں جانتیہوں کہ کس طرح کمپیوٹر / موبائل استعمال کرنا ہے.					
7.	I get anxious when something wrong happens with computer/mobile. کمپیوٹر / موبائل کے ساتھ کچھ غلط ہوتا ہے جب مجھے فکرمحسوس ہوتی ہے.					
8.	I need to learn to use computer/mobile before using it. مجھے کمپیوٹر / موبائل استعمال کرنے سے پہلے سیکھنے کی ضرورت ہے.					
9.	I ask My Brother/Father to solve problems related to computers/Mobiles.					

	میں اپنے بھائی/ ابو کو کمپیوٹر / موبائل سے متعلق مسائل کو حل کرنے کے لئے پوچھتی ہوں.					
10.	If I get a new device, I would be able to use it easily. اگر میں نیا ٹیکنالوجی کا آلہ حاصل کروں تو، میں اسے آسانی سے استعمال کرنے کے قابل ہوں.					
Learning Environment						
11.	I practice the task on computer, which are given, in our book. میں کمپیوٹر پر کام کرتی ہوں جو ہماری کتاب میں دی گئی ہے.					
12.	I used to like computer science but now it has become a boring/difficult subject. میں کمپیوٹر سائنس پسند کرتا تھا لیکن اب یہ بورنگ / مشکل موضوع بن گیا ہے.					
13.	My technological skills: میری تکنیکی مہارت:	○ Very Good ○ Good ○ Average ○ Bad ○ Very Bad				

	(MS Office, Image editing, Video editing, programming, Networking, Database etc.)					
14.	I can learn through video games. میں ویڈیو گیمز کے ذریعے سیکھ سکتی ہوں.					
15.	The computer lab in schools is available for practice. اسکولوں میں کمپیوٹر لیبارٹری کام کے لئے دستیاب ہے.					
16.	I get proper guidance to learn programming/networking in school. میں اسکول میں پروگرامنگ / نیٹ ورکنگ سیکھنے کے لئے مناسب رہنمائی حاصل کرتا ہوں.					
17.	I want to use technology instead of just reading textbook. میں صرف کتاب کتاب پڑھنے کے بجائے ٹیکنالوجی کا استعمال کرنا چاہتی ہوں.					
18.	Our teachers encourage girls to use ICT for practice.					

	ہمارے اساتذہ لڑکیوں کو مشق کے لئے آئی ٹی سی استعمال کرنے کی حوصلہ افزائی کرتے ہیں					
19.	Girls should be allowed to use computer/Mobiles in our culture. لڑکیوں کو ہمارے معاشرے میں کمپیوٹر / موبائل استعمال کرنے کی اجازت دی جانی چاہیئے.					
Views/Perceptions						
20.	All the people in my circle who are working in the field of technology are males. میرے حلقے کے تمام لوگ جو ٹیکنالوجی کے میدان میں کام کر رہے ہیں مرد ہیں.					
21.	After CS IT degree the only choice I will have is to become ICT teacher آئ آئی ٹی ڈگری کے بعد مجھے صرف ایک ہی انتخاب آئی سی ٹی کے استاد بننا ہوگا					
22.	I would choose CS/IT over MBBS/Engineering degree.					

	میں ایم بی بی بی / انجینئرنگ کی ڈگری پر سی ایس / آئی ٹی کا انتخاب کروں گی.					
23.	I would not be able to get a good job after CS/IT as compared to boys. میں لڑکوں کے مقابلے میں CS / IT کے بعد اچھا کام نہیں کروں گا.					
24.	I do not want to choose ICT because It is difficult for girls to work in offices. میں آئی سی ٹی کا انتخاب نہیں کرنا چاہتا کیونکہ اس وجہ سے لڑکیوں کے دفاتر میں کام کرنا مشکل ہے.					
25.	Boys have more access to technology after school. لڑکوں کو اسکول کے بعد ٹیکنالوجی تک رسائی حاصل ہے.					
26.	English is a barrier that I cannot understand computers/Mobiles. انگریزی ایک رکاوٹ ہے جو میں کمپیوٹر / موبائلز نہیں سمجھ سکتا.					

27.	Computer/mobiles have no link with reality. کمپیوٹر / موبائل کے پاس حقیقت کے ساتھ کوئی تعلق نہیں ہے.					
28.	I am interested to participate in the workshop related to Technology. میں ٹیکنالوجی سے متعلق ورکشاپ میں شرکت کرنا چاہتا ہوں.					
29.	House chores is more important for a girl to than learning ICT. آئی سی ٹی سیکھنے کے مقابلے میں ایک لڑکی کے لئے میں گھر کے کاموں کو زیادہ اہمیت دیتا ہوں					
30.	Most of the interfaces does not look attractive to me. زیادہ تر کمپیوٹر سافٹ ویئر دیکھنے میں میرے لئے پرکشش نہیں ہے					

Why do you think boys are better in Technology- Give three reasons?

آپ کیوں سوچتے ہیں کہ لڑکے ٹیکنالوجی میں بہتر ہیں- تین وجوہات دیں؟

1- _____

2- _____ 3- _____
آپ **Urdu** میں لکھ سکتے ہیں

Appendix B:

Pre-Assessment

	Name: _____ Class: _____					
		Strongly Agree بہت زیادہ اتفاق	Agree اتفاق	Neither دونوں میں سےکوئی نہیں	Disagree اختلاف	Strongly Disagree بہت زیادہ اختلاف
Access						
1.	I have a computer at home. میرےگھرمیں کمپیوٹرہے.					

2.	I have a mobile phone. میرےپاس ایک موبائل فون ہے.					
3.	I use Computer/Mobile phone at home. میں گھرمیں کمپیوٹر/موبائل فون استعمال کرتی ہوں.					
4.	I have a computer lab in schools. میرےاسکول میں کمپیوٹرلیب ہے.					
5.	Parents Restrict girls to use Mobile/Computers. والدین موبائل/کمپیوٹر استعمال کرنےکےلئےلڑکیوں کومحدود کرتےہیں.					
Confidence						
6.	I know how to use a computer/mobile. میں جا نتی ہوں کہ کس طرح کمپیوٹر/موبائل استعمال کرناہے.					
7.	I get anxious when something wrong happens with computer/mobile. مجھےفکرمحسوس ہوتی ہے جب کمپیوٹر/موبائل کےساتھ کچھ غلط ہوتاہے .					
8.	I need to learn to use computer/mobile before using it. مجھے کمپیوٹر/موبائل استعمال کرنے سے پہلے سیکھنے کی ضرورت ہے.					

9.	I ask My Brother/Father to solve problems related to computers/Mobiles. میں اپنے بھائی/ ابو کو کمپیوٹر / موبائل سے متعلق مسائل کو حل کرنے کےلئے پوچھتی ہوں.					
10.	If I get a new device, I would be able to use it easily. اگرمیں نئی ٹیکنالوجی کا آلہ حاصل کروں تو، میں اسے آسانی سے استعمال کرنے کے قابل ہوں.					
Learning Environment						
11.	I practice the task on computer, which are given, in our book. میں کمپیوٹر پر کام کرتی ہوں جو ہماری کتاب میں دی گئی ہے.					
12.	I used to like computer science but now it has become a boring/difficult subject. میں کمپیوٹر سائنس پسند کرتی تھی لیکن اب یہ بورنگ / مشکل موضوع بن گیا ہے.					
13.	I have excellent technological skills					

	میرے پاس بہترین تکنیکی مہارت ہے (MS Office, Image editing, Video editing, programming, Networking, Database etc.)					
14.	I can learn through video games. میں ویڈیو گیمز کے ذریعے سیکھ سکتی ہوں.					
15.	The computer lab in schools is available for practice. اسکولوں میں کمپیوٹر لیبارٹری کام کے لئے دستیاب ہے.					
16.	I get proper guidance to learn programming/networking in school. میں اسکول میں پروگرامنگ / نیٹ ورکنگ سیکھنے کے لئے مناسب رہنمائی حاصل کرتی ہوں.					
17.	I want to use technology instead of just reading textbook. میں صرف کتاب پڑھنے کی بجائے ٹیکنالوجی کا استعمال کرنا چاہتی ہوں.					
18.	Our teachers encourage girls to use ICT for practice.					

	ہمارے اساتذہ لڑکیوں کو مشق کے لئے کمپیوٹراستعمال کرنے کی حوصلہ افزائی کرتے ہیں.					
19.	Girls should be allowed to use computer/Mobiles in our culture. لڑکیوں کو ہمارے معاشرے میں کمپیوٹر/موبائل استعمال کرنے کی اجازت دی جانی چاہیئے.					
Views/Perceptions						
20.	All the people in my circle who are working in the field of technology are males. میرے حلقے کے تمام لوگ جو ٹیکنالوجی کے میدان میں کام کر رہے ہیں مرد ہیں.					
21.	After CS IT degree the only choice I will have is to become ICT teacher سی ایس آئی ٹی ڈگری کے بعد مجھے صرف ایک ہی انتخاب کمپیوٹرکا استاد بننا ہوگا					
22.	I would choose CS/IT over MBBS/Engineering degree. میں ایم بی بی ایس/ انجینئرنگ کی ڈگری پر سی ایس / آئی ٹی کا انتخاب کروں گی.					

23.	I would not be able to get a good job after CS/IT as compared to boys. میں لڑکوں کے مقابلے میں CS / IT کے بعد اچھا کام نہیں کرسکوں گی.					
24.	I do not want to choose ICT because It is difficult for girls to work in offices. میں کمپیوٹرکا انتخاب نہیں کرنا چاہتی کیونکہ اس وجہ سے لڑکیوں کے دفاتر میں کام کرنا مشکل ہے.					
25.	Boys have more access to technology after school. لڑکوں کو اسکول کے بعد ٹیکنالوجی تک رسائی حاصل ہے.					
26.	English is a barrier that I cannot understand computers/Mobiles. انگریزی ایک رکاوٹ ہے جو میں کمپیوٹر/موبائلزمیں نہیں سمجھ سکتی.					
27.	Computer/mobiles have no link with reality. کمپیوٹر/موبائل میں حقیقت کے ساتھ کوئی تعلق نہیں ہے.					
28.	I am interested to participate in the workshop related to Technology.					

	میں ٹیکنالوجی سے متعلق ورکشاپ میں شرکت کرنا چاہتی ہوں.					
29.	House chores more important for a girl to than learning ICT. کمپیوٹرسیکھنے کے مقابلے میں ایک لڑکی کے لئے میں گھر کے کاموں کو زیادہ اہمیت دیتی ہوں.					
30.	Most of the interfaces do not look attractive to me. زیادہ تر کمپیوٹرسافٹ ویئردیکھنےمیں میرے لئے پرکشش نہیں ہیں.					
31	I think about using technology in a new way. میں نئی راہ میں ٹیکنالوجی کا استعمال کرنے کی کوشش کرتی ہوں.					
32	I feel confident to show my technical skills مجھے اپنی تکنیکی صلاحیتوں کو ظاہر کرنے کا اعتمادہے.					

Why do you think boys are better in Technology- Give three reasons? آپ کیوں سوچتے ہیں کہ لڑکے ٹیکنالوجی میں بہتر ہیں- تین وجوہات دیں؟ 1- _____ 2- _____ 3- _____
آپ اردو میں لکھ سکتے ہیں

Annex C:

Post Assessment

	Name: _____ Class: _____ Group: Science/Arts/Computer Science					
		Strongly Agree بہت زیادہ اتفاق	Agree اتفاق	Neither دونوں میں سےکوئی نہیں	Disagree اختلاف	Strongly Disagree بہت زیادہ اختلاف
1.	I have a computer at home.					
2.	I have a mobile phone.					

3.	Parents Restrict me to use Mobile.					
4.	I can learn how to use a computer/mobile.					
5.	I would overcome technical anxious with basic technical skills.					
6.	I would try to solve the problems with my mobile and laptops myself.					
7.	After learning basic technical skills, I would not be able to use technology easily.					
8.	Computer science is a boring/difficult subject.					
9.	I am willing to learn basic technical skills.					
10.	I want to learn through video games.					
11.	The computer lab in schools/university is available for practice.					
12.	I can learn programming/networking in school/university and online.					
13.	I want to learn from E-book/videos/Images instead of just reading a textbook.					

14.	Encouragement from teachers and seeing role model motivates me to choose ICT as career.					
15.	Girls should work in the technical department.					
16.	I would be able to deal with the stress in a technical job					
17.	Teaching is not the only choice after CS/IT Degree					
18.	Girls perform better than boys in CS & IT.					
19.	I would be able to get a good job after CS/IT.					
20.	Boys have more access to technology after school.					
21.	I would choose CS and IT in the future.					
22.	Computer/mobiles have no link with reality.					
23.	I enjoyed and learned a lot during the workshop					
24.	I am more interested in-house chores than learning ICT.					

25.	Mobile games/apps are created for boys only.					
26.	I want to use technology in innovative ways.					
2	I feel confident about my technical skills					
What did you like about this workshop? 1- _____ 2- _____ 3- _____						
آپ اردو میں لکھ سکتے ہیں						

Appendix D: Base study Descriptive Statistics

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
You are a:	167	1.00	5.00	1.1377	.51386
Education:	167	1.00	7.00	3.3593	.91323
Age:	167	1.00	4.00	1.3832	.75838
Technology help us in daily life.	167	1.00	4.00	1.5329	.53531

Technology is making my life easy	167	1.00	5.00	1.5389	.70922
ICT was/is my favourite Subject in school.	167	1.00	5.00	2.4251	1.26780
ICT is difficult subject.	167	1.00	5.00	3.3653	1.18910
Studying ICT is/was my own choice.	167	1.00	5.00	2.4371	1.30589
I use ICT just for entertainment.	167	1.00	5.00	3.2874	1.24233
I use ICT to learn other subjects.	167	1.00	5.00	2.3832	1.18085
My teacher uses technology only in ICT class.	167	1.00	5.00	3.2575	1.16662
My ICT teacher helps me to learn better use of technology.	167	1.00	5.00	1.7964	.95400
Studying ICT ensures good jobs.	167	1.00	5.00	1.7425	.87787
Programming languages are easy to learn.	167	1.00	5.00	2.2754	1.07918

Boys are better in learning Computers, Programming, Networking, Java etc.	167	1.00	5.00	2.5629	1.35569
It is required to have a good command over computer languages to Work in the field of ICT.	167	1.00	5.00	1.7066	.80892
My parents want me to study ICT.	167	1.00	5.00	2.2994	1.14342
My parents help me in solving computer problems.	167	1.00	5.00	2.4431	1.13861
I hear people say that ICT is not a field for girls.	167	1.00	5.00	3.8204	1.35017
I believe that boys perform better than girls in ICT.	167	1.00	5.00	2.4671	1.61985
I am aware of freelancing.	167	1.00	5.00	3.6587	1.26001

I play Video Games on internet.	167	1.00	5.00	2.1617	1.18889
I use internet to look up information.	167	1.00	5.00	1.9042	1.08790
I use spreadsheets.	167	1.00	5.00	3.4431	1.34256
I use/used educational software in school.	167	1.00	5.00	2.7964	1.24928
I know how to use computers but I am not interested to use it other than school/college/office work	167	1.00	5.00	3.2575	1.36198
I download music and videos on computers.	167	1.00	5.00	2.2216	1.24379
I organize the computer settings such as files/memory/system.	167	1.00	5.00	2.3473	1.06380
I like to use latest technology.	167	1.00	5.00	1.4970	.89762
Valid N (listwise)	167				

Appendix E: Pre-Assessment Descriptive Statistics - School

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
I have a computer at home.	234	1.00	5.00	1.6453	.74569
I have a mobile phone.	234	1.00	5.00	3.6667	1.11947
I use Computer at home.	234	1.00	5.00	3.5812	1.27531
I have a computer lab in schools.	234	1.00	4.00	1.1496	.48037
Parents Restrict girls to use Mobile/Computers.	234	1.00	5.00	1.7735	.96505
I know how to use a computer/mobile.	234	1.00	5.00	2.8504	1.18243
I get anxious when something wrong happens with computer/mobile.	234	1.00	5.00	1.3291	.75171
I need to learn to use computer/mobile before using it.	234	1.00	5.00	1.5812	.98695

I ask My Brother/Father to solve problems related to computers/Mobiles.	234	1.00	5.00	1.9573	.59890
If I get a new device, I would be able to use it easily.	234	1.00	5.00	3.3120	1.11607
I practice the task on computer, which are given, in our book.	234	1.00	5.00	2.7564	1.24493
I used to like computer science but now it has become a boring/difficult subject.	234	1.00	5.00	2.7949	1.34604
My technological skills: e.g. MS Office, Image editing, Video editing, programming, Networking, Database etc	234	1.00	5.00	3.4359	.97509
I can learn through video games.	234	1.00	5.00	2.6239	.75526

The computer lab in schools is available for practice.	234	1.00	5.00	2.8632	1.18941
I get proper guidance to learn programming/networking in school.	234	1.00	5.00	3.1325	1.16253
I want to use technology instead of just reading textbook.	234	1.00	5.00	1.4786	.95476
Our teachers encourage girls to use ICT for practice.	234	1.00	5.00	3.6838	1.43320
Girls should be allowed to use computer/Mobiles in our culture.	234	1.00	5.00	1.5171	.91818
All the people in my circle who are working in the field of technology are males.	234	1.00	5.00	2.7778	.84010

After CS IT degree the only choice I will have is to become ICT teacher	234	1.00	5.00	2.2051	.65563
I would choose CS/IT over MBBS/Engineering degree.	234	1.00	5.00	2.4615	.96317
I would not be able to get a good job after CS/IT as compared to boys.	234	1.00	5.00	3.2436	1.43697
I do not want to choose ICT because It is difficult for girls to work in offices.	234	1.00	5.00	2.9573	1.35465
Boys have more access to technology after school.	234	1.00	5.00	2.2009	.84802
English is a barrier that I cannot understand computers/Mobiles.	234	1.00	5.00	3.0256	.91212

Computer/mobiles have no link with reality.	234	1.00	5.00	2.8333	1.37498
I am interested to participate in the workshop related to Technology.	234	1.00	5.00	1.5855	1.12481
House chores is more important for a girl to than learning ICT.	234	1.00	5.00	3.2906	1.71867
Most of the interfaces does not look attractive to me.	234	1.00	5.00	3.5855	.96459
Why do you think boys are better in Technology- Reason1	82	1.00	9.00	3.0976	2.24769
Why do you think boys are better in Technology- Reason2	67	1.00	9.00	4.8657	3.20934
Why do you think boys are better in Technology- Reason3	64	1.00	9.00	4.9375	2.95938
Valid N (listwise)	64				

Appendix F: Pre-Assessment Descriptive Statistics – University

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
I have a computer at home.	209	1.00	3.00	1.4498	.50821
I have a mobile phone.	209	1.00	3.00	1.3397	.48477
I use Computer at home.	209	1.00	3.00	1.4354	.50658
I have a computer lab in School/university.	209	1.00	2.00	1.0431	.20348
Parents Restrict girls to use Mobile.	209	1.00	5.00	2.2632	1.34901
I know how to use a mobile.	209	1.00	3.00	1.7943	.47105
I get anxious when something wrong happens with computer or mobile.	209	1.00	5.00	2.4163	1.54544

I need to learn to use computer/mobile before using it.	209	1.00	5.00	2.4354	1.54947
I ask My Brother/Father to solve problems related to computers or Mobiles.	209	1.00	5.00	2.7081	1.10331
If I get a new device, I would be able to use it easily.	209	1.00	5.00	2.8086	1.38040
I practice the task on computer, which are given, in our book.	209	1.00	5.00	2.9522	1.14254
I used to like computer science but now it has become a boring/difficult subject.	209	1.00	5.00	2.6316	1.13220
My technological skills: e.g. MS Office, Image editing, Video editing, programming, Networking, Database etc	209	1.00	5.00	3.4115	.93184

I can learn through video games.	209	1.00	5.00	3.2775	.90910
The computer lab in schools/University is available for practice.	209	1.00	3.00	1.9426	.30470
I get proper guidance to learn programming/networking in school/university.	209	1.00	5.00	3.3541	1.10896
I want to use technology instead of just reading textbook.	209	1.00	2.00	1.0861	.28122
Our teachers encourage girls to use ICT for practice.	209	1.00	5.00	3.4258	.95852
Girls should be allowed to use computer/Mobiles in our culture.	209	1.00	3.00	1.1244	.35872
All the people in my circle who are working in the field of technology are males.	209	2.00	5.00	2.3445	.62479

After CS IT degree the only choice I will have is to become ICT teacher	209	2.00	5.00	2.6794	.98918
I would choose CS/IT over MBBS/Engineering degree.	209	2.00	5.00	3.7177	.82142
I would not be able to get a good job after CS/IT as compared to boys.	209	1.00	5.00	2.2440	1.47178
I do not want to choose ICT because It is difficult for girls to work in offices.	209	1.00	5.00	1.4689	1.00012
Boys have more access to technology after school/university.	209	1.00	5.00	4.5311	.88808
English is a barrier that I cannot understand computers/Mobiles.	209	3.00	5.00	3.3684	.52179

Computer/mobiles have no link with reality.	209	1.00	5.00	3.9043	1.41776
I am interested to participate in the workshop related to Technology.	209	1.00	5.00	2.4163	1.42570
House chores is more important for a girl to than learning ICT.	209	2.00	5.00	4.4402	1.02728
Most of the interfaces does not look attractive to me.	209	1.00	4.00	1.4737	1.04261
Group	209	1.00	2.00	1.4354	.49700
Valid N (listwise)	209				

Appendix G: Post Assessment Descriptive Statistics – School

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
I have a computer at home.	234	1.00	5.00	1.6923	.86378

I have a mobile phone.	234	1.00	5.00	3.4487	1.31005
Parents Restrict me to use Mobile.	234	1.00	5.00	2.2179	1.48510
I can learn how to use a computer/mobile.	234	1.00	5.00	1.4530	.81294
I would overcome technical anxiety with basic technical skills.	234	1.00	5.00	1.9444	1.34942
I would try to solve the problems with my mobile and laptops myself.	234	1.00	5.00	2.3504	1.50145
After learning basic technical skills, I would not be able to use technology easily.	234	1.00	5.00	3.6538	.84651
Computer science is a boring/difficult subject.	234	1.00	5.00	3.7179	.83739
I am willing to learn basic technical skills.	234	1.00	5.00	2.4017	1.08093
I want to learn through video games.	234	1.00	5.00	2.2863	1.09978

I will use the computer lab in schools/university for practice.	234	1.00	5.00	2.5513	1.55291
I can learn programming/networking in school/university and online.	234	1.00	3.00	1.8120	.43321
I want to learn from E-book/videos/Images instead of just reading a textbook.	234	1.00	5.00	2.1880	.68624
Encouragement from teachers motivates me to choose ICT as career	234	1.00	5.00	1.4658	1.10835
Girls should work in the technical department	234	1.00	5.00	2.4786	.94117
I would be able to deal with the stress in a technical job	234	1.00	5.00	3.1154	1.08419

Teaching is not the only choice after CS/IT Degree	234	1.00	5.00	2.6197	.93375
Girls can perform better than boys in CS & IT.	234	1.00	5.00	2.3632	.82899
I would be able to get a good job after CS/IT.	234	1.00	5.00	2.5342	1.68587
Boys have more access to technology after school.	234	1.00	5.00	2.1496	1.59904
I wiould choose CS and IT in the future.	234	1.00	5.00	2.3376	.97683
Computer/mobiles are linked with reality.	234	1.00	5.00	3.2863	1.30666
I would participate in such workshop again	234	1.00	5.00	1.9530	1.07345
I am more interested in house chores than learning ICT.	234	4.00	5.00	4.8889	.31494
Mobile games/apps are created for boys only.	234	1.00	5.00	4.0385	1.45114

I want to use technology in innovative ways.	234	4.00	5.00	4.8889	.31494
Seeing role model gives me motivtion to choose ICT as Career	234	1.00	5.00	2.4487	1.05612
Valid N (listwise)	234				

Appendix H: Post Assessment Descriptive Statistics – University

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
I have a computer at home.	209	1.00	2.00	1.0048	.06917
I have a mobile phone.	209	1.00	2.00	1.0718	.25873
Parents Restrict me to use Mobile.	209	1.00	5.00	3.2967	1.46367
I can learn how to use a computer/mobile.	209	1.00	5.00	2.3301	1.07018

I would overcome tech anxiety with basic technical skills.	209	1.00	5.00	1.7799	1.35142
I would try to solve the problems with my mobile and laptops myself.	209	1.00	5.00	1.8517	1.23335
After learning basic technical skills, I would not be able to use technology easily.	209	1.00	5.00	3.6507	.93927
Computer science is a boring/difficult subject.	209	1.00	5.00	3.8325	1.10318
I am willing to learn basic technical skills.	209	1.00	5.00	3.2440	1.11060
I want to learn through video games.	209	1.00	5.00	3.1388	1.06287
I will use the computer lab in schools/university for practice.	209	1.00	5.00	2.4976	1.63532

I can learn programming/networking online.	209	1.00	5.00	2.7321	1.22670
I want to learn from E-book/videos/Images instead of just reading a textbook.	209	1.00	6.00	2.5455	1.03268
Encouragement from teachers motivates me to choose ICT as career	209	1.00	5.00	2.3780	1.69436
Girls should work in the technical department	209	1.00	5.00	2.3828	.97905
I would be able to deal with the stress in a technical job	209	1.00	5.00	1.8900	1.05718
Teaching is not the only choice after CS/IT Degree	209	1.00	5.00	3.3110	1.43243
Girls can perform better than boys in CS & IT.	209	1.00	5.00	3.3923	1.34062

I would be able to get a good job after CS/IT.	209	1.00	5.00	3.2584	1.33742
Boys have more access to technology after school.	209	1.00	5.00	3.9569	1.32399
I would choose CS and IT in the future.	209	1.00	5.00	2.6651	1.44541
Computer/mobiles are linked with reality.	209	1.00	5.00	2.8565	1.17198
I would participate in such workshop again	209	1.00	5.00	3.2249	1.45845
I am more interested in house chores than learning ICT.	209	1.00	5.00	4.5981	1.03830
Mobile games/apps are created for boys only.	209	1.00	5.00	1.8517	1.43849
I want to use technology in innovative ways.	209	1.00	5.00	1.9378	1.48096
Seeing role model gives me motivtion to choose ICT as Career	209	1.00	5.00	2.8804	1.17672
Valid N (listwise)	209				