Computers & Mobile Phone Technology and Social Skills Development of Pre-Engineering Learners at Higher Secondary Level: An Analysis and Way Forward

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Abstract: In the contemporary era, undoubtedly, there is a significant increase in the use of technology among students that leads to questioning its efficiency and particularly its influence on social skill acquisition. With the aim of revealing this impact on Pre-Engineering students (both Boys and Girls) and suggesting possible enhancements, an exploratory study was carried out. To gather feedback from students, a survey was administered and then by conducting Chi-square tests, it was established that students' utilization of computers or mobile phones had a statistically significant positive influence on their social skill development. According to the findings of the study, it can be recommended that the relevant actors, such as higher secondary level authorities and administrators, raise expenditure/funds for other services connected with the use of computers and mobile phones by students in a more specified manner. Meanwhile, additional research should also be undertaken to examine the effects of computer and mobile technology on other areas of social skills development among adolescent boys and girls more thoroughly.

Keywords: Effectiveness, Computer, Mobile phone technology, Higher secondary level, Pre- Engineering learners, Social skills, Development of social skills.

1. Introduction

The development of advanced technology and its correct application in the educational process have made a substantial impact. The integration of computers and mobile devices in the teaching and learning sphere is now seen as the norm. Ozmen (2008) postulated that pedagogical technology, when used in education, inspires learners and instructors to stay active, focused, and engaged throughout their learning journey. Its goal is to increase understanding, foster problem-solving skills while also uncovering various alternatives. In education, the introduction of Information and Communication Technology (ICT) proves to be very promising and capable of producing great benefits for teachers as well as students during teaching and learning (Isman et al., 2006). A meta-analysis study by Liao (2007) analyzed more than fifty research studies and found that computer-based instruction and mobile learning were positively associated with students' learning performance. According to Senteni (2014), the research also showed that the use of instructional computers and mobile technologies can effectively boost learner motivation and performance, as well as foster a positive mindset. A different point of

view was presented by Bitter and Pierson (2009) when they said that because ICT resources were expanding so quickly, educators were forced to transform their traditional methods of teaching and learning and adopt new innovations in education. Human beings constantly need social skills to survive in society and adapt to their environment; it is an ageless effort to improve and outshine these skills through various avenues, including education and learning processes (Paxon, 2005). Accordingly, Kash and Change (2002) posit that contemporary technology provides a structure for organizing variables influencing learning that would otherwise be overlooked by conventional educational practices. Because of their social nature, humans are also known as the social animals on Earth. These are the socials skills that assist and effect performance as well as educational outcomes (Sung & Chang, 2010). In addition, proficiency in these skills not only aids students in adaptability and understanding others but also in effectively managing their time and resolving conflicts. In addition, these skills also boost their psychosocial ability that help them in understanding different gesture and know diverse individuals globally (Haleem at al, 2022). And lacking of these skills cause difficulties in social adjustment and results in so many psychological and psychosocial illness (Langeveld et al, 2012; Tantam, 2000).

1.1 Statement of the Problem

Researchers have observed an increased utilization of computers and mobile phone technology by learners at the higher secondary level, both inside and outside classrooms. However, it is not evident whether the use of computers and mobile technology is genuinely supportive in developing learners' social skills or not. Mixed results have been reported in the research field. Nevertheless, there has been no study conducted for higher-level students of pre-engineering in this area. Therefore, the current research was undertaken to analyze the effectiveness of computers and mobile phone technology on the social skills development of higher secondary school Pre-Engineering learners.

1.2 Contribution of the Paper to the Literature

The research under study reveals that there are a few research studies conducted in the area, especially in the context of our society, environment, and schools. Also, no specific study is available in this area on the research under consideration. Moreover, there are some gaps in the research conducted and questions to be answered regarding the subject area of research. So, the present research attempts to address multiple gaps and, in doing so, make important contributions to the existing knowledge and literature. This research will truly help in the improvement of the educational institutions, systems, parents, society, and policy makers. And will give a gate way for policy makers of the country. So, it would open new vistas and contribute significantly to the available knowledge. The study under investigation has proposed several key principles for future research endeavors. As such, its significance lies in establishing a motivational groundwork and charting a course for educational researchers to explore additional dimensions of the studied problem. This study serves as a springboard for further inquiry, offering a foundational framework upon which subsequent research can build.

1.3 Research Objectives

These objectives were settled down:
- To analyse the effects of computers and mobile phone technology on the social skills development of boys learners at higher secondary level.
- To analyse the effectiveness of computers and mobile technology on the social skills development of girls learners at higher secondary level.
- To find the differences of the effects between boys and girls learners social skills enhancement
- To suggest measures to improve social skills development of both genders of learners at higher secondary level.

1.4 Hypotheses of the Study

In view of the research objectives, the subsequent hypotheses that are stated in null form were framed and tested:-

H₁: There is no significant effect of computers and mobile phone technology on social skills development of Pre-engineering boys learners exposed to computer and mobile technology at higher secondary level.

H₂: There is no significant effect of computers and mobile phone technology on social skills development of Pre-engineering girls learners exposed to computer and mobile technology at higher secondary level.

H₃: There is no significant difference between the social skills development of boys and girls learners exposed to computer and mobile phone technology

2. Literature Review

Among number of modern equipment used as educational technology, one is the emergence of computer and mobile phone that help the teaching and learning idea, which play an important role in our life. Both technologies offer numerous benefits to students', notably in fostering social integration within in social framework. It is the social competences that engage the individual in an appropriate behavior, enabling him/her to forge interpersonal connections and interact with others in well acceptable behavior pattern. It has been observed that previous researches have explored enhancement in social skills, there exists a gap in research specifically addressing the needs of adult learners at the higher secondary level, irrespective of gender (Sandberg & Bostrom, 2006). No doubt the recent age is the age of social media and social networks integrally affected the overall students' community and it is the part of their daily life (Raghavendra et al, 2018). To survive in this modern age one's must equip him/her with social skills and these skills can be learned through multiple mediums. Out of which online platform is one of the best and easiest medium in learning those skills (McNaughton et al, 2018). On other side, it has been reported by some researchers that computer and mobile based community failed to foster the substantive and genuine relationships and a valid social bonding. But on the other hands, few researchers disparage computer & mobile mediated based communities in a way that they are unable to foster substantive and genuine personal relationships and valid social bonding (Chan, 2015; Swar & Hameed, 2017; Chatterjee, 2020).

It has been observed on the basis of research that technology and specifically mobile technology has a significant role in the adjustment of individual in the social adjustment as well as better learning outcomes in comparison to those who learns through tradition ways (Olojo, 2012). This result was endorsed by Sivin-Kachala and Bialo (2000). In their finding results were consistent across different subjects and the technology improved children special needs and problem solving skills. In addition their learning attitude was also positive. The research of Lajoie (2000) unearth that the use of technology under different circumstance is very flexible and user friendly and students acquire multiple forms of knowledge and skills on their own pace. Similarly other studied revealed the other valuable aspects of the learning that is collaboration among learners and interaction with concepts (Thirunarayanan and Perez-Prado, 2012). The use of technology creates the link between real world and written world and helpful in inculcating proficiency, high attitude with self-leaning discipline (Roschelle, Gordin, & Means, 2000; Bergin, Ford, & Hess, 1998; Parette, Hourcade, & Heiple, 2000). Chen (2011) expressed that communities contain essential components of social interaction, a communal value system, and a unified symbol system.

These three fundamental elements from the basis of a considerable portion of the research carried out on E-leaning communities. Many studies have looked at how boys and girls act differently when they're aggressive (Cillessen & Mayeux, 2004). Boys were reported high in comparison with girls in physical aggression aspects. Dealing of such behavior girls shows in direct way of using this aspect. Now, learning is the need and a way to educate the generation and the best tool is "technology" and through this students can learn, communicate and improve their multiple skills (Thirunarayanan and Perez-Prado, 2012). The technology that can makes the learning as a fun and the nature of the learning becomes real, interactive and productive. Students use their cognitive skills to activate their unconscious by the use of relevant software with enjoyment (Roschelle et al., 2000). The use of technology makes the students onboard and creates their interest in learning process (Balannskat, 2006). Some experts think that watching TV and using other electronic devices might have helped improve certain thinking skills over time. When students use technology to learn, they might take more control of their own learning and do better on their own (Balanskat, 2006). Studies have also shown that using computers to learn can help students stay interested and remember more (Atif, 2014; Husamettin & Burak, 2006; Serin, 2011; Muzammila & Murad, 2011) Studies examining gender differences in academic achievement among learners have yielded diverse findings, with

some indicating significant variations while others report no distinctions between boys and girls. Michelon (2006) highlighted discrepancies in cognitive abilities between boys and girls, raising questions regarding which gender performs better across various cognitive tasks. These findings have resulted in conflicting conclusions, revealing disparities in cognitive traits between boys and girls. Gender diversity in cognition, encompassing intellectual abilities, is widely acknowledged in contemporary scientific literature. Genetic and inherent disparities, coupled with environmental and cultural influences, contribute to cognitive distinctions between males and females. Generally, girls exhibit advantages in verbal fluency, perceptual speed, accuracy, and fine motor skills, whereas boys excel in spatial awareness, working memory, and numerical aptitude. In the concluding remarks, researcher Rheingold (1999) emphasized the urgency of examining how our technological devices from computers and email to social media and mobile phones affect our social interactions. He stressed the need to address the complex questions arising from the dual-edged impacts of technology.

The use of electronic devices impacts students' cognitive development, academic skills, and social interactions. Studies have observed a shift in traditional parent-student dynamics, with students often assuming the role of teachers to their parents regarding computer usage (Subrahmanyam et al, 2000). Concerns have been raised about the erosion of parental authority in online interactions and the potential social effects of excessive gaming, particularly when games involve aggression (Imran et al, 2022). Research suggests that exposure to violent video games may increase aggressive behavior in students, highlighting the need for moderation and monitoring of gaming habits.

It is fact that technologies including media tools are the main and acceptable tool now a day for social interaction and social recognition across the gender. Consequently, these media tools hold significant potential for providing observational learning opportunities that facilitate the development and progression of children. Additionally, analyses have highlighted the capacity of virtual reality, akin to computer simulations, to enable human-computer interaction, wherein users actively engage within three-dimensional virtual environments (Riva, 2005). Moreover, multiple research endeavors have explored the impact of computer-assisted instruction (CAI) on students' interest, achievement and retention (khalil et al, 2018; Liaqat & Umar Ali, 2012). Some researchers have been investigated the effect of teaching learning software for problem solving, mathematical thinking, attitude and for academic performance also (khalil et, al, 2017 & 2019; Atif, 2014; Husamettin & Burak, 2006; Muzammila & Murad, 2011). Additionally, investigations have assessed the effects of computer-based instructions on the achievements and problem-solving skills specifically within the realm of science education (Serin, 2011). Cumulatively, these studies underscore the positive impact of technology in enhancing various cognitive and social skills among students.

The utilization of virtual reality appears to hold potential for enhancing the acquisition, maintenance and generalization of the social skills from the formal classroom to informal natural settings. It has been concluded as a result of so many researches that digital technology increased the interest and retention of students and also affected the level of achievement as well as problem solving skills (Liaqat & Umar Ali, 2012; Atif, 2014; Husamettin & Burak, 2006; Muzammila and Murad, 2011). Another research of also reported by Serin (2011) that the computer based instructions of science students showed positive impact of technology on different cognitive and social skills enhancement of students.

Research on the impact of computer and mobile technology on social skills enhancement highlights the increasing use of e-learning tools in both classroom and home settings. However, questions arise regarding how this technology affects students' social skills. Studies indicate significant differences in usage patterns between genders, with boys typically spending more time on computers than girls (Kousloglou et al., 2023). While literature suggests that e-learning tools can enhance cognitive abilities and some social skills, evidence on their overall impact remains mixed. While they may improve communication and problem-solving skills, excessive internet use has been linked to increased isolation and sadness. Moreover, involvement in aggressive computer games can lead to violent behaviors and difficulty discerning reality from simulation. Nevertheless, e-learning tools have the potential to foster global friendships and cultural awareness. The researchers advocate for further systematic study to better understand these effects and inform policies aimed at maximizing the benefits and mitigating the risks of e-learning technology for students.

3. Research Methodology
To analyze the effectiveness of computers and mobile phone technology on social skills development at higher secondary level learners of Pre-engineering students, survey based study i.e Higher Secondary Level learners' self-reported appraisal was conducted for data collection.

3.1 Population of the Study
Population of the study was taken from two schools of Peshawar City. Boys and girls learners of Pre-engineering group of higher secondary level classes were included in the study.

3.2 Sample of the Study
The sampling technique used for the study was purposive/convenience sampling. The sample was drawn from two colleges, including FDC Peshawar and Inter College Peshawar Cantt. Initially, a sample of 280 learners was individually surveyed. Subsequently, a total of 70 learners were selected, comprising 35 boys learners and 35 girls learners, equally from both colleges. The selection criteria were based on the fact that the sampled learners frequently or always used computer and mobile technology in their classrooms and outside classrooms. Similarly, two teachers were selected as research assistants to conduct surveys among their respective learners. The social skills included in the students self-reported surveys encompassed emotional management skills, Spoken conversation skills, sharing materials skills, complimenting others skills and showing flexibility skills .

3.3 Research Tools of the Research
The researchers observed diversity in the utilization of tools for research purposes. It is noted that the selection of tools is influenced by the objectives of the study, and consequently, they shape the design and measurement objectives from abstract concepts to tangible outcomes, facilitating a clearer understanding. In pursuit of this, the researchers sought guidance from experts and obtained approval from relevant stakeholders. The following research tools were used for the research:-
(a)   An initial survey was conducted for total 280 sample learners to separate the sample learners; who were using computer and mobile technology almost always or often during inside classrooms and outside classrooms.
(b)   Another surveys questionnaires for social skills rating checklists were made for the reason to gauge the effectiveness of computer and multimedia on social skills development of boys and girls learners. Tool was students' self-reported survey conducted by researcher.

4. Data Analysis
Calculated the total responses of students self-reported survey based on social skills rating checklist.. Also hypotheses were tested at significance level alpha: $\alpha = 0.05$. Chi Square test was applied for testing hypothesis. Data was analyzed and interpreted. Chi square test was used to judge frequency patterns. So, significance of differences between the boys' pre engineering learners and girls Pre-Eng. learners were found by applying Chi-square test. SPSS version-27 and MS-Excel were used for data analysis. Looking at the collected data conclusions were made that:
(a)   What is the general pattern of responses of learners about social skills development?
(b)   Are there any gender differences between boys and girls learners social skills enhancement using computers and mobile phones in their daily lives?
Data analysis and interpretation of Students' self-reported survey are explained in the following tables and its details in subsequent paragraphs. Symbols used for rating were:
AA : Almost always, **OFT**   : Often**,   ST**   :Sometimes and **AN** : Almost never

4.1 Results
The results comprised opinions gathered via data tools and subsequently tabulated. The numerical values represent the opinions of the sampled individuals who utilized computer or digital technology, whether within or outside the classroom setting. As such, the ensuing findings were derived from a self-reported survey conducted among students.

4.2 Opinion about Emotional Management Skills Development

Table 1:   Opinion about Emotional Management Skills

Statements	Learners Responses	Levels of Agreement				Df	Tab value	X^2
		AA	OFT	ST	AN			
1. I Know likes and dislikes emotions	35 Boys	8	17	5	5	3	7.815	14.40
	35 Girls	13	12	5	5	3	7.815	8.90
2. Recognize emotions of others easily	35 Boys	13	10	7	5	3	7.815	14.20
	35 Girls	10	15	5	5	3	7.815	11.80
3. Convey care and kindness towards friends	35 Boys	15	9	5	6	3	7.815	32.60
	35 Girls	16	10	5	5	3	7.815	34.40
4. Avoid violent behaviors towards friends	35 Boys	12	13	6	4	3	7.815	14.60
	35 Girls	13	12	6	4	3	7.815	19.00
5. Do not display extreme fears and phobias	35 Boys	15	10	5	5	3	7.815	21.20
	35 Girls	13	11	5	6	3	7.815	13.60
6. Easily agree with friends	35 Boys	8	15	7	5	3	7.815	21.60
	35 Girls	8	15	6	6	3	7.815	17.00

* Degree of freedom: df = 3, Chi Squares(Cal value) : X^2 ,   Significance level : α = 0.05,

The self-reported survey conducted among students indicated that a majority of male learners utilize computer and mobile phone tools. The results demonstrated that their responses favored the usage of these tools and suggested that, in their opinion, such usage contributed to enhanced emotional management for both genders. Furthermore, comparative analysis via the chi-square test indicated superior performance by male students.

4.3 Opinion about Spoken Communication Skills Development

Table 2: Opinion about Communication Skills Development

Statement	Learners Responses	Levels of Agreement				Df	Tab value	X^2
		AA	OFT	ST	AN			
1. I, start conversation, when it is suitable to begin	35 Boys	12	12	6	5	3	7.815	19.00
	35 Girls	11	12	7	5	3	7.815	12.60
2. Introduce to someone who is new for me	35 Boys	8	15	6	6	3	7.815	13.60
	35 Girls	5	12	12	6	3	7.815	14.00
3.Introduces friends to one another on meeting	35 Boys	6	10	15	4	3	7.815	19.00
	35 Girls	7	12	11	5	3	7.815	10.80

4. Build a mixture of comments in conversation	35 Boys	16	8	6	5	3	7.815	16.40
	35 Girls	16	7	7	5	3	7.815	21.60
5. Ask and respond to "Wh" related Questions	35 Boys	16	9	5	5	3	7.815	17.20
	35 Girls	13	10	6	6	3	7.815	18.60
6. Ends discussions appropriately and friendly	35 Boys	10	12	6	5	3	7.815	19.40
	35 Girls	7	16	6	6	3	7.815	21.00

Table 2 presents students' opinions concerning the integration of mobile technology into their daily lives and its impact on their communication skills. The results indicate a positive perception from both genders, with no significant difference observed according to the chi-square test.

4.4 Opinion about Sharing Materials Skills Development

Table 3 Opinion about Sharing Material with Classmates

Statement	Learners Responses	Levels of Agreement				Df	Tab value	X^2
		AA	OFT	ST	AN			
1. Give material to classmates in a courteous way	35 Boys	13	12	5	5	3	7.815	22.60
	35 Girls	15	8	5	7	3	7.815	19.20
2. Do not hesitate to share materials with my classmates	35 Boys	9	10	11	5	3	7.815	12.60
	35 Girls	13	10	7	5	3	7.815	11.00
3.Helps classmates in sharing material	35 Boys	13	10	5	7	3	7.815	21.60
	35 Girls	13	11	6	5	3	7.815	17.40
4.Shares food items with classmates	35 Boys	16	10	5	4	3	7.815	14.00
	35 Girls	11	09	10	5	3	7.815	13.60
5. Asks friends for help in study matters	35 Boys	12	11	6	6	3	7.815	15.60
	35 Girls	14	9	6	6	3	7.815	13.80
6. Helps weak & needy classmates in sharing study solutions	35 Boys	13	11	5	6	3	7.815	31.20
	35 Girls	8	14	8	5	3	7.815	12.20

Table 3 presents students' opinions regarding cooperation and collaboration, particularly concerning mobile technology. The results distinctly indicate that mobile technology is perceived as the most effective tool for sharing and collaboration, with a positive impact in this regard. However, comparative analysis via the chi-square test favored boys.

4.5 Opinion about Complimenting Others Skills Development

Table 4: Opinion about Complimenting Others Skills

Statement	Learners Responses	Levels of Agreement				Df	Tab value	X^2
		AA	OFT	ST	AN			
1. Warmly and properly accept compliments of others	35 Boys	11	13	5	6	3	7.815	15.80
	35 Girls	6	13	11	5	3	7.815	11.80
2. when nin fault, Makes confession independently	35 Boys	11	13	6	5	3	7.815	13.60
	35 Girls	6	12	11	6	3	7.815	11.00
3. Always Welcome people warmly	35 Boys	14	12	4	5	3	7.815	27.60
	35 Girls	5	8	15	7	3	7.815	9.00
4.Asks for a help courteously and say thanks for favour	35 Boys	12	11	6	5	3	7.815	25.80
	35 Girls	15	10	5	5	3	7.815	23.40
5. Gives compliments to friends on relevant occasiosn	35 Boys	15	8	6	6	3	7.815	17.60
	35 Girls	15	10	5	5	3	7.815	15.40
6.Pays regards to seniors and love to juniors	35 Boys	16	8	5	6	3	7.815	47.00
	35 Girls	20	6	5	4	3	7.815	42.00

Students self-reported survey revealed that majority of boys students who are using computer and mobile tools almost always or often in their daily life have good skills of complimenting others (Table 4 statements S. No.1 to 6) whereas, majority of Girls students also have good skills of complimenting others (Table 4 S.No.1 to 6). By comparing chi squares of both boys and girls students for all six statements of the said table (Table 4), it was found that boys students exposed to computer and mobile tools have better skills of complimenting others than the girls students who exposed to computer and mobile tools

4.6 Opinion about Showing Flexibility Skills Development

Table 5: Opinion about showing Flexibility Skills

Statement	Learners Responses	Levels of Agreement				Df	Tab value	X^2
		AA	OFT	ST	AN			
1. Flexible in all dealings in my daily life	35 Boys	13	10	6	6	3	7.815	21.00
	35 Girls	9	13	7	6	3	7.815	10.40
2. Agree to consequences of actions	35 Boys	11	13	6	5	3	7.815	17.40
	35 Girls	10	10	9	6	3	7.815	9.60
3. Agrees to surprising	35 Boys	10	15	5	5	3	7.815	25.60

situations and changes	35 Girls	8	15	7	6	3	7.815	10.40
4.Keeps on trying till a problem is solved	35 Boys	13	9	8	5	3	7.815	17.00
	35 Girls	10	12	8	5	3	7.815	9.40
5. Allows others when it is desirable to do so	35 Boys	10	13	7	5	3	7.815	19.20
	35 Girls	7	10	13	5	3	7.815	12.80
6. Does not get angry or upset, if make mistakes	35 Boys	5	13	11	6	3	7.815	19.00
	35 Girls	11	14	5	5	3	7.815	17.20

* Degree of freedom: df = 3, Chi Squares(Cal value) : X^2 , Significance level : $\alpha = 0.05$,
Students self-reported survey revealed that majority of boy students who are using computer and mobile tools almost always or often in their daily life have good flexibility skills in all matters of daily life (Table 5 statemenst S. No.1 to 6) whereas majority of girls students who are using computer and mobile tools almost always or often in their daily life also have good flexibility skills in all matters of daily life (Table, 6 statemenst S.No.1 to 6). By comparing Chi squares of both boy and girls for all six statements of the said table (Table 5), it was observed that the boys learners who used to computer and mobile tools have better skills of flexibility than the girls learners who exposed to computer and mobile tools.

4.7 Discussion
The research delves into how the social skills of pre-engineering students at the higher secondary level can be augmented through computer and mobile technology. Utilizing quantitative data and testing null hypotheses, the study focuses solely on a specific demographic, indicating a causal link between technology use and social skills development. Indeed, social skills are divers in nature, and it needs to explore it criticially with reference to the educational purposes. The result of this study showed that the use of mobile technology has a significant impact on students' social skills enhancement across the gender. Although, in some skills the significant differences were observed between the genders but overall the boys responses were observed greater in favour of girls. There is need that other researchers must develop and investigate the causal effect relationship. Despite the complexity of technology's impact on social skills development, it remains an integral component of modern education, warranting continued investigation and thoughtful consideration in research endeavors.

5. Conclusion
The analysis of students' self-reported surveys and literature review underscored the substantial positive impact of computers and mobile phones on enhancing social skills among pre-engineering students at the higher secondary level, regardless of gender. It was determined that both boys and girls experienced significant improvements across various social skills domains with the utilization of computer and mobile phone tools. However, the overall findings revealed that boys exhibited notably greater enhancement in social skills compared to girls, particularly in their daily utilization of computers and mobile tools inside and outside the classroom.

5.1 Study Recommendation
Based on the study results, it is recommended that the government and other concerned stakeholders in the community should increase financial assistance and related infrastructure, along with other relevant facilities for online learning. This includes computers, laptops, and mobile phone gadgets for pre-engineering learners at the higher secondary level

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