AVAILABILITY AND USED OF INFORMATION COMMUNICATION TECHNOLOGY AT HIGH SCHOOL OF RAWALPINDI DISTRICT

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By

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Reg: No: 433-FSS/MSEDU/F21

A thesis submitted in partial fulfilment of the requirement for the degree of MS in Education

Department of Educational Leadership and Management
Faculty of Education
INTERNATIONAL ISLAMIC UNIVERSITY, ISLAMABAD
2024

Dedicated

To

My Parents, Wife, Family and my Respected Teachers

SUPERVISOR'S CERTIFICATE

The thesis titled "AVAILABILITY & USED OF INFORMATION COMMUNICATION TECHNOLOGY AT HIGH SCHOOL OF RAWALPINDI DISTRICT" submitted by Mr. Khalil ur Rehman Farooqui Reg. No. 433-FSS/MSEDU/F21 in partial fulfillment of MS degree in Education, has been completed under my guidance and supervision. I am satisfied with the quality of the student's research work and allow him to submit this for further process as per IIUI rules and regulation.

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AUTHOR'S DECLARATION

I, Khalil ur Rehman Farooqui Regd. No. 433-FSS/MSEDU/F21 as a student of MS in Education at International Islamic University, Islamabad do hereby declare that the thesis entitled "AVAILABILITY AND USED OF INFORMATION COMMUNICATION TECHNOLOGY AT HIGH SCHOOL OF RAWALPINDI DISTRICT" submitted for the partial fulfillment of MS in Education is my original work, except where otherwise acknowledged in the text and has not been submitted or published earlier and shall not in future, be submitted by researcher for obtaining any degree from this or any other university or institutions.

_____

Khalil ur Rehman Farooqui

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Khalil ur Rehman Farooqui

ABSTRACT

The availability of ICT facilities in the school environment is one of the motivational forces that attract students to use the facilities for learning. Use of ICT in the classroom increases the motivation of the students**,** showing more interest and becoming more involved in the areas they study. One self-structured Questionnaire was used in this study as a research tools at high schools of Rawalpindi City. Data was collected from boys & Girls High Schools on Five Point Likert- Scale in the construction of questionnaire. Availability, Usability and Accessibility were the variables in the tool. The objectives of the study was to find out the availability of ICT equipment among students and teachers in boys & girls high schools of Rawalpindi. To examine the usage of Information Communication Technology facilities available in boys & girls high schools of Rawalpindi. To measure the access to Information Communication Technology facilities in boys & girls high schools of Rawalpindi. The population of the study was of 6960 students consisting 3095 female students and 3865 male students of class 9^{th} and 10^{th} and 348 Teachers consisting 186 female teachers and 162 male teachers of all boys & girls schools of Rawalpindi city. Only 34 boys & girls high schools of Rawalpindi city were selected as a sample of schools 386 female students, 309 male students of class 9^{th} and 10^{th}, 37 female teachers and 32 male teachers were chosen as a sample to conduct the research. Due to limited time and financial constraints, convenient sampling technique was used. One Questionnaire was used as a research instruments, each for teachers and students. Validity was assessed based on the researcher's own experiences as well as a survey of related literature and experts input. Using the Split-half test and SPSS, the questionnaire's reliability was examined. For data collection from the targeted schools, questionnaire was used by personal visit. Before distribution of questionnaire among respondents appropriate procedure was adopted for permission of Principal, Education Officers, heads, teachers and students of the concerned schools. The investigation was quantitative in nature. SPSS (Version 24) was utilized to analyze the study's data. In conclusion ICT enhances the thinking and reasoning skills of the students and improves critical learning skills of the students. It is highly recommended to the Teachers & Administrative staff to establish innovative practices like use of ICT in teaching and learning in several government and government-aided schools in the country.

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CHAPTER 01

INTRODUCTION

1.1 Background of the Study

Information and Communication Technology (ICT) is the capability for a person or group to transmit numerous tasks using hardware and software resources. It is a process, than a product that supports and maintains groundwork for information transfer through audio, graphics, and video. The way individuals work, acquire, communicate, and go about their daily lives is changing as a result of the extensive use of technology. (Revathi & Aithal, 2019)

Technology had a long-term effect on education. Information technology can help teachers and students in this two-way process by creating it quicker. Entrance to new technological fundamentals has made it easier for people and organizations to keep up with the fast pace of modifications. The "few things," the only computer lab teacher, or the specialist who can run the program "mysterious" augmentative communication device used by kids with communication boundaries used to capture technology in the previous years.(Yasmeen, Alam, Mushtaq, & Alam Bukhari, 2015)

Compared to the present day life, this one has exclusive demands for a specific level of information. (A. S. Khan, Nawaz, & Khan, 2011)

Electric media is the key to make teaching and learning more specific since it has greater impact for conceptual skills. In the near future, media, a teacher's proficiency, and their use of modern technologies will be used in the classroom for instructional

methods. Therefore, it is strongly recommended to include media into the teaching and learning process. (Council et al., 2010)

The ability of teacher for use it and would improve the scale of their instruction. Various researches have established the efficiency of technology-enhanced education; examples of these enhancements include emails, chat rooms based on computers, and websites with varying degrees of difficulty. By making peer writing groups, collaborative designs, and environmental obstacles easier, this kind of learning boost communication, teamwork, collaborative learning, and problem-solving abilities among students and teachers. School staff face numerous hurdles in training of their staff, one that appears to be unmet. It is obvious that having access to high tech facilities in the real world is not adequate because of the need for growth of human resources to complete the desired and demanded results of technology. (Badilla Quintana, Vera Sagredo, & Lytras, 2017)

1.2 Rationale of the Study

Most significantly, at the wake of Covid-19, the effectiveness and necessity of ICT has increased a lot in our education sector. Usually face to face classroom interaction is considered to be the ideal way of learning in schools but utilizing the information technology resources has also become the need of an hour. The present study was intended to explore the availability, usage & access of ICT facilities in high schools of Rawalpindi District. Although there are numerous studies that have addressed the issue but this study has tried to support its beneficial outcomes for the students and teachers respectively.

1.3 Statement of the Problem

The important part of our lives as well as for school curriculum that Information Communication Technology facilities have been provided to schools. The problem is whether the ICT facilities are available in schools and what extent the ICT facilities are being used for students and school teachers towards ICT. There might be opinion differences in availability, use and access towards ICT equipment used in labs of Rawalpindi city high schools. The present study intends to focus the above said problem.

1.4 Objectives of the Study

Following were the objectives of the study:

1. To find out the availability of ICT equipment among students and teachers in boys & girls high schools of Rawalpindi.
2. To examine the usage of Information Communication Technology facilities available in boys & girls high schools of Rawalpindi.
3. To measure the access to Information Communication Technology facilities in boys & girls high schools of Rawalpindi.

1.5 Research Questions

R Q.1: To what extent the availability of ICT equipment in boys & girls high schools of Rawalpindi?

R Q.2: How about the usage of Information Communication Technology facilities available in boys & girls high schools of Rawalpindi?

R Q.3: How to measure the access of Information Communication Technology facilities in boys & girls high schools of Rawalpindi?

1.6 Significance of the Study

The study is supporting to teachers & students of higher secondary level to overcome the gaps and problem in the use of ICT to become successful in their knowledge and abilities. This study was focused on the Boys & Girls high school students learning experiences through ICT what they are performing in school to learn innovative mode of study and in respect of improving their technological skills.

Technology is changing day by day, knowledge atmosphere, moving and growing requirements of students, collective demands of new & modern technologies are the major issues of the schools in Pakistan. Schools & our education sector developed aptitudes to overcome the challenges of technological aspect having in mind to ready for present and future challenges. Simultaneously, the data has also reflected the utility of using ICT for students & teachers. Combining both teacher's and student's understanding under one study has given a comparative understanding of the effectiveness of using ICT in higher secondary government educational institutions. This study has also provided some precautions to be taken by teachers to develop a positive understanding of educational technologies and their application.

We may desire good performance of ICT resources with determination to save our learning time. We will try our best for any future challenges of the schools, creativity and innovation to accept the changes within the limits to encourage the talented individuals of the society & schools within the given resources of ICTs.

1.7 Delimitations of the Study

The research was restricted to:

1. High Schools of Rawalpindi District.
2. Government Boys & Girls High schools of Rawalpindi City.
3. Information taken by authenticated official web portal of educational authorities.

1.8 Conceptual/Theoretical Framework of the Study

ICT as a collection of technical devices and resources which are used to transmit, store and manage information; however, the utilization of ICT in the instructive process has been partitioned into two general classifications: ICT for education and ICT in education. ICT for education suggests the development of ICT particularly for teaching and learning purposes. ICT in education includes the adoption of general parts of ICT in the instructional process. (Toyo, 2017).

The concept for this study revolves around the facilities of Information Communication Technology (ICT) used into high schools in Rawalpindi District. It is based on several key concepts and components.

1.8.1 ICT Accessibility:

This idea includes the availability of ICT tools for teachers and students, such as computers, internet access, and software. A fundamental component of successfully integrating technology into education is accessibility.

1.8.2 ICT Utilization

This component focuses on how effectively these ICT resources are being used in the teaching and learning processes. It considers factors like the integration of ICT into the curriculum, the frequency of use, and the extent to which technology enhances educational outcomes.

1.8.3 Equity in Access

Equity in access is an important aspect, as it examines whether all students and teachers, regardless of gender or socioeconomic background, have equal opportunities to utilize ICT resources.

1.8.4 Functionality and Educational Objectives

This part of the framework assesses whether the ICT facilities are functional and meet the intended educational objectives. It involves evaluating the quality and relevance of the technology available.

1.8.5 Informed Decision-Making

The ultimate goal of the study was to provide data that can be beneficial for decision-making. This concept emphasizes the importance of using research findings to make evidence-based decisions regarding ICT integration in education.

1.9 Operational Definitions

1.9.1 ICT

Information Communication Technology defined as sharing, transmission, storing, and exchange of information through computers, Internet, live broadcasting media , recorded broadcast media and telephonic media (Gupta, 2021)

1.9.2 Usage

A consistent, fair custom that is accepted in a certain area or workplace and that binds parties to transactions primarily based on assumed familiarity.(Veblen & Mayer, 2022)

1.9.3 Availability

Something with availability is easy to get. (Calamanan & Vargas, 2021).

1.9.4 Access

It was Permitted for a user to read access to a file, but will not be allowed to change it.(El Sibai, Gemayel, Bou Abdo, & Demerjian, 2020)

1.10 Methodology of the Study

1.10.1 Population of the study

The study's population was of 6960 students of class 9^{th} and 10^{th} and 348 Teachers all boys & girls schools of Rawalpindi city.

1.10.2 Sampling Technique

Due to limited time and financial constraints, convenient sampling technique was used**.**

1.10.3 Sample

695 students were selected of class 9^{th} and 10^{th}, and 69 teachers were chosen as a sample to conduct the research.

1.10.4 Research Instruments

One Questionnaire was used as a research instruments, each for teachers and students.

1.10.5 Validity

Validity was assessed by the researcher's own experiences as well as a survey of related literature and expert input.

1.10.6 Reliability

Using the Split-half test and SPSS, the questionnaire's reliability was examined.

1.10.7 Data Collection

For data collection from the targeted schools, questionnaire was used by personal visit. Before distribution of questionnaire among respondents appropriate procedure was adopted for permission of Principal, Education Officers, heads, teachers and students of the concerned schools.

1.10.8 Data Analysis

The investigation was quantitative in nature. SPSS (Version 24) was utilized to analyze the study's data.

CHAPTER 02

LITERATURE REVIEW

ICT as a collection of technical devices and resources which are used to transmit, store and manage information; however, the utilization of ICT in the instructive process has been partitioned into two general classifications: ICT for education and ICT in education. ICT for education suggests the development of ICT particularly for teaching and learning purposes. ICT in education includes the adoption of general parts of ICT in the instructional process. (Toyo, 2017).

It implies that we have more freedoms to utilize ICT in education for preparing programs now a days and work on nature of instructor for instruction. ICT is a logical, innovative and designing discipline and the board strategy utilized in taking care of data, its application and relationship with social, financial and social matters". Educator is the principle part of the instructive field in our general public. He more works for the improvement level of our general public in the each field. Gifted instructors can make the imaginative understudies in type of the great social laborer, legislator, artist, thinker and so forth for the general public (Barbour et al., 2020).

2.1 Historical Perspective in Education

In the beginning of the usage of computers in the classroom. Mainframe computers were utilized in universities during this time for research. Nevertheless, neither educators nor students could easily access them. A big change came with the introduction of microcomputers in the past, like the Apple II and the Commodore PET. These devices enabled educational institutions like schools and universities to begin utilizing computers for teaching. Teaching pupils the fundamentals of computer

programming and problem-solving techniques was the main goal at first.(Zawacki-Richter & Latchem, 2018)

The graphical user interface (GUI) and the advent of personal computers in the historical perspective was completely changed the way computers were utilized in classrooms. Word processors, spreadsheets, and educational games were among the software programs that started to appear for educational purposes. During this time, the phrase "computer-assisted instruction" (CAI) was frequently used. (Dix, 2017)

An increase in internet accessibility, which created new opportunities for online education. Teachers around the world may now share materials and knowledge thanks to the World Wide Web. Online courses and remote learning become possible with the rise in popularity of learning management systems (LMS) and virtual classrooms.(M. M. Hassan, Mirza, & Hussain, 2020)

ICT in education has rapidly expanded in the twenty-first century. This is the time that's commonly called "e-learning" or "digital education." Tablets, smartphones, and smart boards have all become standard equipment in schools. Massive Open Online Courses (MOOCs) and Open Educational Resources (OER) have gained popularity, increasing the accessibility of education for a global audience.(M. M. Hassan et al., 2020)

ICT usage in education has intensified due to the COVID-19 pandemic. In order to maintain educational continuity in the face of widespread school closures, educators and institutions had to quickly adapt to online learning platforms, video conferencing technologies, and other digital resources. It's possible that this experience resulted in long-term adjustments to the way education is provided, with a stronger focus on online

and mixed learning. Throughout its historical development, ICT has gone from being a supplemental tool to being an essential component of teaching and learning. It has made it possible for students and teachers to collaborate globally, to provide individualized learning experiences, and to have better access to educational resources. The future of education is still being shaped by the continued growth of ICT, with new developments in virtual reality, artificial intelligence, and other areas promising even more progress in the sector. (Bozkurt et al., 2020)

2.2 Global Trends in High Schools

The integration of technology in high schools is a global trend driven by the increasing recognition of the importance of digital literacy and technology skills for students in the 21st century.(Stopar & Bartol, 2019)

2.2.1 Online Learning Platforms

High schools are increasingly using (LMS) and other forums to deliver the content, assignments, and assessments. These platforms provide a centralized location for teachers to share resources and for students to access materials. (Bradley, 2021)

2.2.2 Blended Learning

In these models, combining traditional classroom teaching with online resources and activities, are becoming more prevalent This approach allows for greater flexibility and customization of learning experiences.(A. Kumar et al., 2021)

2.2.3 Flipped Classrooms

The flipped classroom model involves students learning content online at home through videos or digital materials and then engaging in active discussions and

activities in the classroom. It's an approach that leverages ICT to enhance classroom interactions.(Karlsson & Janson, 2016)

2.2.4 Digital Textbooks

Traditional textbooks are being replaced or supplemented by digital textbooks and e-books. These digital resources often include interactive features, multimedia elements, and the ability to update content more easily.(Dobler, 2015)

2.2.5 Teacher Professional Development

To effectively integrate ICT, teacher professional development programs are essential. Many countries are investing in training teachers to use technology in their teaching methods. (Hennessy et al., 2022)

2.3 Benefits in Education

The integration of technology in education offers a wide range of benefits to students, educators, and educational institutions. Here are some of the key advantages.(Rabah, 2015)

2.3.1 Up-gradation of Learning Experiences

ICT tools and resources make learning more engaging and interactive. Multimedia elements, simulations, and online educational games can help students grasp complex concepts more effectively. (Abdulrahaman et al., 2020)

2.3.2 Personalized Learning

ICT allows for the customization of learning experiences. Students can learn on their own time frame, access resources as per their needs, and receive immediate feedback through online quizzes and assessments.(Cardenas, Castano, Guzman, & Alvarez, 2022)

2.3.3 Access to Global Information

The internet provides access to a vast amount of information from around the world. Students can explore diverse perspectives, conduct research, and stay up-to-date with current events and developments. (Hewson, Vogel, & Laurent, 2015)

2.3.4 Improved Teacher Efficiency

ICT tools can streamline various tasks for educators assigned by school management, allowing them to focus more on teaching and interacting with students. Digital grading system, attendance tracking, and lesson planners application can save time.(Reimers, Schleicher, Saavedra, & Tuominen, 2020)

2.3.5 Online Collaboration

ICT enables online learning experiences. Students can communicate with peers and teachers online. This prepares them for teamwork and remote collaboration, valuable skills in the modern workforce.(Rodríguez, Riaza, & Gómez, 2017)

2.3.6 Accessibility

ICT can make education more accessible to students with disabilities. Text-to-speech software, screen readers, and adaptive technology can assist students with visual or auditory impairments, enhancing their learning opportunities.(Matoušek et al., 2020)

2.3.7 Flexible Learning Environments

ICT supports various learning modalities, including online learning, blended learning, and flipped classrooms. This flexibility allows students to choose the best learning environment for their needs.(Müller & Mildenberger, 2021)

2.3.8 Rich Educational Resources

Online libraries, databases, and open educational resources (OER) provide a wealth of educational materials that can supplement traditional textbooks. These

resources are often free or low-cost, reducing financial barriers to education.(Butcher, 2015)

2.3.9 Global Reach

Online courses and digital platforms enable educational institutions to reach a global audience. Students from different countries can enroll in courses and benefit from diverse perspectives and expertise. (Allen & Seaman, 2016)

2.3.10 Skill Development

Skill development is essential in today's digital age and are transferable to various career paths.(Mahmud & Wong, 2022)

2.3.11 Cost Savings

Initial investments in ICT infrastructure, over time, digital resources and online tools can lead to cost savings for educational institutions. They can reduce the need for physical facilities and materials.(Lu, Tsai, & Wu, 2015)

2.3.12 Lifelong Learning

ICT integration encourages a culture of lifelong learning. Students are more likely to continue using technology for self-improvement and skill development beyond their formal education. (Terziev, 2019)

2.3.13-Preparation for the Future

ICT integration prepares students for a technology-driven future job market. It equips them with the skills and digital literacy needed to adapt to evolving technologies and industries.(Ama & Emetarom, 2020)

2.4 Challenges of Technology Implementation in High Schools

While the integration of Information and Communication Technology (ICT) in high schools offers numerous benefits, it also presents several challenges. These challenges can vary depending on the region, school infrastructure, and resources available, but some common issues include.(Alkahtani, 2017)

2.4.1 Infrastructure and Access

It refers to access the technology and the internet at appropriate place with all necessary resources. Many high schools, especially in rural areas were blank in necessary infrastructure, including reliable internet connectivity and up-to-date hardware, to effective integration in ICT. (Azıonya & Nhedzı, 2021)

2.4.2 Costs

Implementing ICT can be expensive. Purchasing devices, software licenses, and maintaining infrastructure can strain the budgets of schools and school districts. This financial burden limited the extent to which ICT can be integrated.(Carver-Thomas, Leung, & Burns, 2021)

2.4.3 Teacher Training

Teachers often require training to effectively use ICT in their teaching methods. A lack of professional development opportunities and resistance to change among educators can hinder successful implementation. (Albugami & Ahmed, 2015)

2.4.4 Digital Literacy Gaps

Students levels of digital literacy, with some being more comfortable with technology than others. Addressing these gaps and ensuring that all students have the necessary skills can be a challenge.(Alexander, Adams, & Cummins, 2016)

2.4.5 Content Quality and Adaptation

All digital content may not be of high quality, and educators must spend more time for curating and adapting digital resources to align with their need & curriculum. Finding appropriate and relevant digital content can be time-consuming. (McKinley, 2021)

2.4.6 Privacy and Security

Schools must follow strong security measures and adhere to data protection regulations to safeguard students' information. (P. C. Kumar, Chetty, Clegg, & Vitak, 2019)

2.4.7 Technical Issues and Downtime

Technical issues and network failures can disrupt the learning process. Schools need technical support teams in place to address these issues promptly.(Reich, 2020)

2.4.8 Overreliance on Technology

While ICT can enhance learning, over reliance on technology can lead to passive learning experiences and reduced social interaction among students. Striking a balance between traditional teaching methods and technology is essential.(Schindler, Burkholder, Morad, & Marsh, 2017)

2.4.9 Content Filtering and Censorship

Schools often employ content filtering to block access to inappropriate websites and materials. However, these filters can sometimes be overly restrictive, limiting access to valuable educational resources.(Schindler et al., 2017)

2.4.10-Copyright and Licensing

The use of digital resources must adhere to copyright and licensing agreements. Understanding and managing these legal aspects can be complex for educators and institutions.(Harris, 2018)

2.4.11-Sustainability and Environmental Concerns

The constant upgrading and disposal of technology can have environmental impacts. Schools need to consider the sustainability of their ICT practices and the responsible disposal of electronic waste.(Saldaña-Durán & Messina-Fernández, 2021)

2.4.12 Resistance to Change

Some educators, students, and parents resisted the integration of ICT due to concerns about its effectiveness or a preference for traditional teaching methods. Overcoming resistance to change can be a significant challenge. (Saldaña-Durán & Messina-Fernández, 2021)

2.4.13 Pedagogical Transformation

Effective ICT integration requires a shift in teaching approaches to leverage the technology fully. This transformation can be challenging for educators who are accustomed to traditional teaching methods. (Kinshuk, Chen, Cheng, & Chew, 2016)

2.4.14 Assessment and Accountability

Measuring the impact of ICT integration on student learning and ensuring accountability can be complex. Standardized assessments always aligned with the skills developed through ICT. (Kubiszyn & Borich, 2024)

2.4.15 Ethical and Digital Citizenship Education

With the use of ICT, students need education on responsible digital behavior, cyberbullying prevention, and ethical considerations. Integrating these topics into the

curriculum can be a challenge. It's important to recognize that while ICT integration can be challenging, it also offers significant opportunities to students for a technology-driven world.(Gudmundsdottir & Hatlevik, 2020)

2.5 Policies and Initiatives by Government of Pakistan.

IT & Telecommunications Division Ministry of Science & Technology Government of Pakistan Islamabad.(Arfeen, Iqbal, & Mushtaq, 2017)

2.5.1 National ICT Policy

Pakistan has a National IT Policy that outlines the government's vision and strategy for the development and promotion of the information technology sector across the country. This policy aims to improve IT infrastructure, digital literacy, and e-governance.(M. H. Hassan & Lee, 2019)

2.5.2 E-Governance Initiatives

E-governance initiatives have been undertaken at various levels of government in Pakistan. These initiatives aim to improve administrative efficiency, transparency, and public service delivery through the use of ICT. Rawalpindi City is likely to have its own e-governance projects or participated in broader regional or provincial initiatives.(M. Khan, Khurram, & Zubair, 2020)

2.5.3-Broadband Expansion

Efforts have been made to expand broadband internet access in urban and rural areas across Pakistan. This includes improving internet infrastructure in cities like Rawalpindi to facilitate greater ICT adoption.(Javed, 2020)

2.5.4 Smart City Initiatives

Some cities in Pakistan, including Rawalpindi, have shown interest in smart city projects. These initiatives often involve the integration of ICT for urban planning, traffic management, waste management, and the overall improvement of public services.(Hong, 2022)

2.5.5 Education Initiatives

The government of Pakistan, at both the federal and provincial levels, has been working to enhance ICT integration in education. This includes providing schools with computer labs, introducing digital textbooks, and implementing e-learning solutions.(Qazi, Sharif, & Akhlaq, 2024)

2.5.6 Digital Skills Training

Various training programs and initiatives aim to improve digital literacy and skills among the population, including students, teachers, and the workforce. These programs were extended to Rawalpindi City.(Abbas, Shah, & Tariq, 2023)

2.5.7 Start-Up Ecosystem Development

The government, along with private organizations, has been fostering the growth of the IT and technology start-up ecosystem in Pakistan. Incubators, accelerators, and innovation hubs have been established in major cities, and Rawalpindi had similar initiatives. (Zaidi, Khan, Khan, & Mujtaba, 2023)

2.5.8 Cyber security Initiatives

With the growing importance of digital security, the government of Pakistan has introduced policies and initiatives to strengthen cyber security measures, protect critical infrastructure, and combat cyber threats.(Shad, 2019)

2.5.9 Digital Payments and Financial Inclusion

The adoption of digital payment systems and efforts to promote financial inclusion have been part of Pakistan's digital agenda. This includes promoting mobile banking and digital wallet solutions.(Rasheed, Siddiqui, Mahmood, & Khan, 2019)

2.5.10 Telemedicine and Health Tech

Especially in light of the COVID-19 pandemic, there has been an increased focus on telemedicine and health tech solutions. These initiatives aim to improve healthcare access and delivery through ICT.(Bokolo, 2021)

2.6 Gaps in the Existing Literature at High Schools with proposals.

Identifying the gaps in existing literature on ICT (Information and Communication Technology) of high schools in Rawalpindi, Pakistan, can be valuable for policymakers, and educators looking to address important issues and improve educational practices. While I don't have access to specific literature databases, I can suggest some potential research gaps based on common trends and challenges in the field. These gaps were or were not existed in the current literature, so it's essential to conduct more literature review to confirm their existence.(Hossain, 2023)

2.6.1 Access and Infrastructure Disparities

Investigate the extent of disparities in ICT access and infrastructure among high schools in Rawalpindi. This could include variations in internet connectivity, computer availability, and the quality of ICT resources.(Yasmeen et al., 2015)

2.6.2 Digital Literacy and Skills Development

Examine the effectiveness of digital literacy programs in Rawalpindi high schools. Evaluate whether students are acquiring the necessary digital skills to thrive in a technology-driven society.(Anzak & Sultana, 2020)

2.6.3 Teacher Preparedness

Explore the level of teacher preparedness and training in integrating ICT into the curriculum. Assess the impact of teacher professional development programs on ICT integration.(Tondeur, Forkosh-Baruch, Prestridge, Albion, & Edirisinghe, 2016)

2.6.4 E-Learning during the COVID-19 Pandemic

Investigate the experiences and challenges faced by high schools in Rawalpindi during the COVID-19 pandemic, focusing on the rapid shift to e-learning and its effectiveness.(Rehman, Zhang, & Iqbal, 2021)

2.6.5 Student Learning Outcomes

The impact of ICT integration on student learning outcome can make academic performance as demonstrable by students which was very much needed in Rawalpindi high schools to improve learning experiences.(Yousaf, Qutab, Imran, & Yousuf, 2023)

2.6.6 Impact of Online Assessment

Examine the challenges and benefits of conducting online assessments and examinations in high schools, particularly in the light of remote learning is very essential to create positive impact.(Ali, 2020)

CHAPTER No -03

Research Methodology

The main concern of this study was to investigate ICT equipment availability, usage and access for students &Teachers in High Schools of Rawalpindi District with the focus on quantitative research methodology.

3.1 Research Design

In current research descriptive survey type design was used. In view of the related literature review by the researcher, questionnaires were developed through a quantitative approach to evaluate the problems and issues in ICT resources of high schools of Rawalpindi city.

3.2 Population

All girls & boys of high schools of Rawalpindi District was the target of Rawalpindi city & (6960) students consisting (3865) and (3095) respectively of class 9th and 10th and 348 Teachers consisting 186 female teachers and 162 male teachers and 174 Boys & Girls High Schools consisting of 81 Boys & 93 girls schools respectively of Rawalpindi city. (Mills & Gay, 2016)

Table. 3.2

Population

S.No	Group	No of Schools	No. of Teachers	No. of Students
1	Boys High Schools	81	162	3095
2	Girls High Schools	93	186	3865
	Total	174	348	6960

3.3 Sampling Technique

Simple random sampling technique was used in this study.

3.4 Sample

Gay suggests 10% of large populations and 20% of small population. Using Gay's suggestion, our sample of the study was comprised of 386 female students and 309 male students of class 9th and 10th and 32 male teachers of 17 Boys high Schools & 37 female teachers of 18 girls' high schools of Rawalpindi city. (Mills & Gay, 2016)

Table 3.4

Sample of the Study-Students

S.No	Group	Total	10 %
1	Boys	3095	162
2	Girls	3865	186
		6960	348

Table 3.4.1

Sample of the Study-Teachers

.No	Group	Total	20 %
1	Teachers (Male)	162	32
2	Teachers (Female)	186	37
			69

3.5 Research Tool/ Instruments

One self-structured Questionnaire was used as a research tools at high schools of Rawalpindi City. Data was collected from boys & Girls High Schools on Five Point Likert- Scale in the construction of questionnaire. Availability, Usability and Accessibility were the variables in the tool.

All the questions of the questionnaire were related to the following points:

1. Availability of ICT equipment
2. Usage of ICT facilities
3. Access to ICT facilities

3.6 Data Analysis and Interpretation

The data analysis of this project was carried out using IBM Statistical Package for Social Sciences (SPSS) version 21. The data that was analyzed has been presented here in tabulated form using frequency, relative frequency, mean, and square distribution.

3.6.1 Validity

One self-structured questionnaire was developed as a data collection tool for High Schools of Rawalpindi City for students and teachers respectively. The questionnaire was initially had 75 items which after the review and guidance of the supervisors, the items were reduced to 30 items. Content validation was also addressed for this data collection form, as it is the degree to which a research questionnaire measures every feature of a concept accurately (Elsevier, 2013). For content validation, language and format, the questionnaires were sent to educational experts (Appendix A) for the valued opinions. These educational experts gave their appropriate suggestions for the improvement of different questions of the questionnaires. By incorporating the suggestions, feedback of the experts and after approvals from the supervisor, the final and improved version of data collection form was developed.

3.6.2 Pilot Testing

Before commencing the formal data collection, the researcher had done the pilot testing of the developed questionnaire and had provided the validity and reliability of the tool.

3.6.3 Reliability

With the aim of ensuring the reliability of the developed data collection form, the researcher had self-administered the questionnaires from 10 students and 5 teachers to get their responses. After one month, the questionnaire was re-tested by administering them again to the same respondents. Reliability of the questionnaire was assessed through a measure of internal consistency, Split-half test, using SPSS. The overall Split-half test, using SPSS reliability of the questionnaire was 0.85 and 0.90 from the students and the teachers respectively. Yagci had reported this that Split-half coefficient value between 0.80 and 0.90 is considered a highly reliable range from a measuring tool (Yagci & Güneyli, 2019).

Table 3.6.3

Reliability of the questionnaires

S.No	Questionnaire	Reliability
1	Boys High Schools	.85
2	Girls High Schools	.90

3.7 Data Collection

In order to complete the targeted sample size, data collection was carried out by the researcher by personally visiting the selected schools.

Table 3.7

Over all Response Rate

S.No	Respondents	Delivered to Respondents	Received	%
1	Teachers	69	42	61
2	Students	348	215	62

The data presented in table 3.7 shows that, 69 questionnaires were distributed to teachers. In 69 out of 42 received back. Thus 61% returned back. 348 questionnaires were distributed to students. In 348 out of 215 received back. Therefore 62% returned back.

3.8 Data Analysis

It was a quantitative study. IBM SPSS (version 24) was used for data analysis of this study. After the termination of data collection, it was followed by cleaning and feeding of the data for any mistakes. The data was analyzed and presented in tabulated form using frequency, relative frequency, and Chi-Square distributions.

CHAPTER 04

DATA ANALYSIS AND INTERPRETATION

Analyzing data is the process for looking or checking pattern of data which collected through questionnaire & generated to arrive at relevant conclusion.

Data collected from teachers and students from different High schools of Rawalpindi City regarding availability, use & access of Information Communication Technology Equipment at Higher Secondary School Level in Rawalpindi City.

The purpose of the study was to know the opinion of respondents about the availability, use & access of Information Communication Technology Equipment at Higher Secondary School Level in Rawalpindi City.

Table with interpretation in the form of percentages of results were intended to understand the data.

In order to carry further description if needed for the study for any future refinement, data was analyzed with appropriate sequence in this research. SPSS (Version, 24) was used for data analysis of the study

4.1 Analysis of Teachers Questionnaire

Table 4.1.1

'he school has a dedicated computer lab with sufficient computers for students.

Scale	Frequency	Percent
SA	34	81.0
A	2	4.8
N	2	4.8
DA	2	4.8
SDA	2	4.8
Total	42	100.0

Table 4.1.1 shows that, 81.0% of the respondents from teachers strongly agreed that their school had a dedicated computer lab with sufficient computers, while 4.8% of the remaining respondents also agreed to this. Furthermore, 4.8% of the total respondents remained neutral about this, and 4.8% of the total respondents from teachers disagreed to this. While the remaining 4.8% of the teachers strongly disagreed that their school labs did not have a dedicated computer lab and sufficient computers. In brief, majority of the teachers agreed that their schools did have dedicated labs and sufficient computers.

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Table 4.1.2

The school provides internet access for both students and teachers.

Scale	Frequency	Percent
SA	33	78.6
A	5	11.9
N	1	2.4
DA	2	4.8
SDA	1	2.4
Total	42	100.0

The results presented in the table 4.1.2 show that, 78.6% of the respondent teachers strongly agreed, and 11.9% of the respondent teachers agreed to the fact that their school provided access to internet for the teachers as well as students. On the other hand, 2.4% of the respondents remained neutral, and 4.8% of the respondent teachers disagreed, while 2.4% of the respondent teachers strongly disagreed to this statement. So, it is evident from these results that most of the schools did have internet facility for teachers and students.

Table 4.1.3

'he school has interactive whiteboards or projectors in classrooms for teaching purposes.

Scale	Frequency	Percent
SA	33	78.6
A	2	4.8
N	2	4.8
DA	1	2.4
SDA	4	9.5
Total	42	100.0

The results in the table 4.1.3 are showing that, 78.6% of the respondent teachers strongly agreed, and 4.8% of the respondent teachers agreed that their schools had interactive whiteboards and projectors in their classrooms. On the other hand, 4.8% of the respondent teachers remained neutral, 2.4% of the respondent teachers disagreed, and 9.5% of the respondent teachers strongly disagreed to this statement. Again, there results also show that majority of the schools did have the above mentioned facilities.

Table 4.1.4

The school offers training programs for teachers.

Scale	Frequency	Percent
SA	33	71.6
A	3	7.1
N	1	2.4
DA	4	9.5
SDA	4	11.4
Total	42	100.0

The results of the table 4.1.4 show that, 71.6% of the respondent teachers strongly agreed, and 7.1% of the respondent teachers agreed that their schools offered training programs for the teachers. On the other hand, 2.4% of the respondent teachers remained neutral, 9.5% of the respondent teachers disagreed, and 11.4% of the respondent teachers strongly disagreed to this statement. Therefore, it is evident from these results that majority of the schools where data was collected, were offering training programs for their teachers.

Table 4.1.5

The school provides technical support for students and teachers when ICT issues arise

Scale	Frequency	Percent
SA	35	83.3
A	4	9.5
DA	3	7.1
Total	42	100.0

The results presented in the table 4.1.5 show that, out of all the participants, 83.3% of the respondent teachers strongly agreed, and 9.5% of the respondent teachers agreed that their school provided the technical support to its teachers and students in case of any ICT issue. On the other hand, 7.1% of the respondent teachers strongly disagreed to this statement. Therefore, as it's evident from the above-mentioned results, majority of the school did offer ICT technical support to their teachers and students.

Table 4.1.6

The school values the integration of ICT as an essential part of the educational experience.

Scale	Frequency	Percent
SA	33	76.1
A	3	7.1
N	1	2.4
DA	3	7.2
SDA	2	4.8
Total	42	100.0

The results presented in the table 4.1.6 show that, out of all the participants, 76.1% of the respondent teachers strongly agreed, and 7.1% of the respondent teachers agreed that their school considered integration of ICT as an integral part of their educational experience. On the other hand, 2.4% of the respondent teachers remained neutral, 7.2% of the respondent teachers disagreed, and 4.8% of the respondent teachers strongly disagreed to this statement. Therefore, it's evident from the above-mentioned results that majority of the schools considered ICT integration as an essential part of their educational activities.

Table 4.1.7

The school provides updated ICT equipment to the students

Scale	Frequency	Percent
SA	28	66.6
A	3	7.1
N	1	2.4
DA	8	19.0
SDA	2	4.8
Total	42	100.0

The results presented in the table 4.1.7 show that, out of all the participants, 66.6% of the respondent teachers strongly agreed, and 7.1% of the respondent teachers agreed that their school provided updated ICT equipment to the students. On the other hand, 2.4% of the respondent teachers remained neutral, 19% of the respondent teachers disagreed, and 4.8% of the respondent teachers strongly disagreed to this statement. Therefore, it's evident from the above-mentioned results that majority of the schools did provide updated ICT equipment to their students.

Table 4.1. 8

Students are using enough time for solving their problems through the computer.

Scale	Frequency	Percent
SA	32	76.2
A	5	11.9
N	1	2.4
DA	2	4.8
SDA	2	4.8
Total	42	100.0

The results presented in the table 4.1.8 show that, out of all the participants, 76.2% of the respondent teachers strongly agreed, and 11.9% of the respondent teachers agreed that their students use enough time for solving their problems through the use of computers. On the other hand, 2.4% of the respondent teachers remained neutral, 4.8% of the respondent teachers disagreed, and 4.8% of the respondent teachers strongly disagreed to this statement. Therefore, it's clear from the results that majority of the students in the selected schools were using computer to solve their problems.

Table 4.1.9

The computer teacher gives the proper space for each student in allocated time

Scale	Frequency	Percent
SA	30	71.4
A	2	4.8
N	2	4.8
DA	4	9.5
SDA	4	9.5
Total	42	100.0

The results presented in the table 4.1.9 show that, out of all the participants, 71.4% of the respondent teachers strongly agreed, and 4.8% of the respondent teachers agreed that their school's computer teacher gave the proper space for each student in their allocated time. On the other hand, 4.8% of the respondent teachers remained neutral, 9.5% of the respondent teachers disagreed, and similarly 9.5% of the respondent teachers strongly disagreed to this statement. Therefore, it's evident from the above-mentioned results that majority of the computer school teachers gave the space for each student in their allocated time.

Table 4.1.10

The computer lab equipment is updated as per need

Scale	Frequency	Percent
SA	25	59.5
A	7	16.7
N	5	11.9
DA	3	7.1
SDA	2	4.8
Total	42	100.0

The results presented in the table 4.1.10 show that, out of all the participants, 59.5% of the respondent teachers strongly agreed, and 16.7% of the respondent teachers agreed that their school's computer lab equipment was up to date as per need. On the other hand, 11.9% of the respondent teachers remained neutral, 7.1% of the respondent teachers disagreed, and 4.8% of the respondent teachers strongly disagreed to this statement. Therefore, it's clear that majority of the schools did have updated computer labs.

Table 4.1.11

I regularly use ICT facilities, such as computers and the internet, for academic purposes

Scale	Frequency	Percent
SA	28	66.7
A	8	19.0
N	2	4.8
DA	3	7.1
SDA	1	2.4
Total	42	100.0

The results presented in the table 4.1.11 show that, out of all the participants, 66.7% of the respondent teachers strongly agreed, and 19% of the respondent teachers agreed that they regularly used ICT facilities, such as computers and internet, for academic purpose. On the other hand, 4.8% of the respondent teachers remained neutral, 7.1% of the respondent teachers disagreed, and similarly 2.4% of the respondent teachers strongly disagreed to this statement. Therefore, it's evident from the above-mentioned results that majority of the school teachers were regular users of ICT facilities.

Table 4.1.12

I find ICT facilities in my school/library easy to use

Scale	Frequency	Percent
SA	32	76.2
A	6	14.3
N	1	2.4
DA	1	2.4
SDA	2	4.8
Total	42	100.0

The results presented in the table 4.1.12 show that, out of all the participants, 76.2% of the respondent teachers strongly agreed, and 14.3% of the respondent teachers agreed that their school's ICT facilities were easy to use and user friendly. On the other hand, 2.4% of the respondent teachers remained neutral, 2.4% of the respondent teachers disagreed, and 4.8% of the respondent teachers strongly disagreed to this statement. Therefore, it's clear that majority of the teachers found their school's ICT facilities easy to use and user friendly.

Table 4.1.13

I feel confident in using a variety of software

Scale	Frequency	Percent	Chi-Square
SA	31	73.8	
A	5	11.9	38.53
DA	4	9.5	
SDA	2	4.8	
Total	42	100.0	

Significant df=3, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.1.13 show that, out of all the participants, 73.8% of the respondent teachers strongly agreed, and 11.9% of the respondent teachers agreed that they were confident is using variety of software. On the other hand, 9.5% of the respondent teachers disagreed, and similarly 4.8% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was greater than calculated value (38.53) at 0.05 levels. Therefore, it clearly indicates that majority of the teachers were confident in using a variety of software.

Table 4.1.14

The ICT facilities at my school/library contribute positively to my overall learning experience

ale	equency	rcent	Chi-Square	
SA	35	83.3		
A	4	9.5		
N	1	2.4		106.09
DA	1	2.4		
SDA	1	2.4		
Total	42	100.0		

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.1.14 show that, out of all the participants, 83.3% of the respondent teachers strongly agreed, and 9.5% of the respondent teachers agreed that the ICT facilities at their schools contributed positively to the learning experience. On the other hand, 2.4% of the respondent teachers remained neutral, 2.4% of the respondent teachers disagreed, and similarly 2.4% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was greater than the calculated value (106.09) at 0.05 levels. Therefore, it is clearly evident that the majority of the teachers believed that ICT facilities at their schools contributed positively to the learning experience.

Table 4.1.15

In my computer lab, enough digital tools are used for learning.

Scale	Frequency	Percent	Chi-Square	
SA	31	73.8		
A	6	14.3		
DA	3	7.1		54.19
SDA	2	4.8		
Total	42	100.0		
Significant df=3,		$X^{2\ at}$ p-value 0.05 = .000		

The results presented in the table 4.1.15 show that, out of all the participants, 73.8% of the respondent teachers strongly agreed, and 14.3% of the respondent teachers agreed that they used enough digital tools for learning in their computer labs. On the other hand, 7.1% of the respondent teachers disagreed, and 4.8% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was greater than the calculated value (54.19) at 0.05 levels. Therefore, it is clear that majority of the teachers stated that they used enough digital tools for learning in their computer labs.

Table 4.1.16

I use different tools like calendar and task Manager for preparing my exam schedule

Scale	Frequency	Percent	Chi-Square	
SA	28	66.7		
A	7	16.7		
N	2	4.8		59.19
DA	3	7.1		
SDA	2	4.8		
Total	42	100.0		

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.1.16 show that, out of all the participants, 66.7% of the respondent teachers strongly agreed, and 16.7% of the respondent teachers agreed that they used tools like digital calendar and task managers for preparing their exam schedule. On the other hand, 4.8% of the respondent teachers remained neutral, 7.1% of the respondent teachers disagreed, and 4.8% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was greater than the calculated value (59.19) at 0.05 levels. Therefore, it is clear that majority of the teachers did use digital tools stated that they used enough digital tools like digital calendar and task managers for preparing their exam schedule.

Table 4.1.17

I am using Google Drive for my assignments to be stored for a long time

Scale	Frequency	Percent	Chi-Square
SA	25	59.5	
A	7	16.7	
N	4	9.5	42.52
DA	2	4.8	
SDA	4	9.5	
Total	42	100.0	

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.1.17 show that, out of all the participants, 59.5% of the respondent teachers strongly agreed, and 16.7% of the respondent teachers agreed that they were using Google Drive as a storage tool for assignments to be stored for a long time. On the other hand, 9.5% of the respondent teachers remained neutral, 4.8% of the respondent teachers disagreed, and 9.5% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was greater than the calculated value (45.52) at 0.05 levels. Therefore, it is clear that majority of the teachers did use did use Google Drive as a storage tool for assignments to be stored for a long time.

Table 4.1.18

Teachers were not used for instruction us with interactive board in computer lab

Scale	Frequency	Percent	Chi-Square	
SA	14	33.3		
A	2	4.8		
N	2	4.8		20.38
DA	8	19.0		
SDA	16	38.1		
Total	42	100.0		

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.1.18 show that, out of all the participants, 33.3% of the respondent teachers strongly agreed, and 4.8% of the respondent teachers agreed that sometimes teachers were not used interactive board for instruction in the computer lab. On the other hand, 4.8% of the respondent teachers remained neutral, 19% of the respondent teachers disagreed, and 38.1% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (45.52) at 0.05 levels. Therefore, it is clear that majority of the teachers did not use interactive board for instruction in their computer labs.

Table 4.1.19

We are familiar with multimedia projector for our presentations

Scale	Frequency	Percent	Chi-Square
SA	27	64.3	
A	5	11.9	
N	4	9.5	51.81
DA	3	7.1	
SDA	3	7.1	
Total	42	100.0	

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.1.19 show that, out of all the participants, 64.3% of the respondent teachers strongly agreed, and 11.9% of the respondent teachers agreed that they were familiar with the use of projector for their presentations. On the other hand, 9.5% of the respondent teachers remained neutral, 7.1% of the respondent teachers disagreed, and similarly 7.1% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (51.81) at 0.05 levels. Therefore, it is clear evident that majority of the teachers were familiar with the use of projector for their presentations.

Table 4.1.20

We are using digital tools when classes are not possible due to any unavoidable circumstances (Zoom, Google Meets)

Scale	Frequency	Percent	Chi-Square
SA	30	71.4	
A	4	9.5	
N	1	2.4	70.14
DA	4	9.5	
SDA	3	7.1	
Total	42	100.0	

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.1.20 show that, out of all the participants, 71.4% of the respondent teachers strongly agreed, and 9.5% of the respondent teachers agreed that they do use digital tools when classes are not possible due to unavoidable circumstances. On the other hand, 2.4% of the respondent teachers remained neutral, 9.5% of the respondent teachers disagreed, and similarly 7.1% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (70.14) at 0.05 levels. Therefore, it is clear that majority of the teachers were using digital platforms for classes when there were not possible familiar with the use of projector for their presentations.

Table 4.1.21

I have regular access to a computer for educational purposes at school.

Scale	Frequency	Percent	Chi-Square
SA	31	73.8	
A	4	9.5	
N	2	4.8	76.33
DA	3	7.1	
SDA	2	4.8	
Total	42	100.0	

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.1.21 show that, out of all the participants, 73.8% of the respondent teachers strongly agreed, and 9.5% of the respondent teachers agreed that they had regular access to a computer for educational purposes at school. On the other hand, 4.8% of the respondent teachers remained neutral, 7.1% of the respondent teachers disagreed, and similarly 4.8% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (76.33) at 0.05 levels. Therefore, it is clear evident that majority of the teachers had regular access to a computer for educational purposes at school.

Table 4.1.22

The school offers effective access to ICT resources for learning

Scale	Frequency	Percent	Chi-Square	
SA	34	81.0		
A	4	9.5		
N	1	2.4		98.23
DA	2	4.8		
SDA	1	2.4		
Total	42	100.0		

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.1.22 show that, out of all the participants, 81.0% of the respondent teachers strongly agreed, and 9.5% of the respondent teachers agreed that their schools offered effective access to ICT resources for learning. On the other hand, 2.4% of the respondent teachers remained neutral, 4.8% of the respondent teachers disagreed, and similarly 2.4% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (98.23) at 0.05 levels. Therefore, it is clear evident that majority of the teachers reported that their schools offered effective access to ICT resources for learning.

Table 4.1.23

There is a variety of software accessible for educational purposes in the school's ICT lab.

Scale	Frequency	Percent	Chi-Square	
SA	27	64.3		
A	9	21.4		
N	1	2.4		56.09
DA	3	7.1		
SDA	2	4.8		
Total	42	100.0		

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.1.23 show that, out of all the participants, 64.3% of the respondent teachers strongly agreed, and 21.4% of the respondent teachers agreed that there was a variety of software accessible for educational purposes in the school's ICT lab. On the other hand, 2.4% of the respondent teachers remained neutral, 7.1% of the respondent teachers disagreed, and similarly 4.8% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (56.09) at 0.05 levels. Therefore, it is clearly evident that teachers reported that there is a variety of software accessible for educational purposes in the school's ICT lab.

Table 4.1.24

Easy Access to ICT facilities enhanced my academic performance at my school

Scale	Frequency	Percent	Chi-Square	
SA	25	59.5		
A	10	23.8		
N	2	4.8		46.33
DA	3	7.1		
SDA	2	4.8		
Total	42	100.0		
Significant df=4,		$X^{2\ at}$ p-value 0.05 = .000		

The results presented in the table 4.1.24 show that, out of all the participants, 59.5% of the respondent teachers strongly agreed, and 23.8% of the respondent teachers agreed that the easy access to ICT facilities enhanced their academic performance at their school. On the other hand, 4.8% of the respondent teachers remained neutral, 7.1% of the respondent teachers disagreed, and similarly 4.8% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (46.33) at 0.05 levels. Therefore, it is clear that majority of the teachers reported that the easy access to ICT facilities enhanced their academic performance at their school.

Table 4.1.25

I find updated Access of ICT facilities in my school/library to be accessible

Scale	Frequency	Percent	Chi-Square
SA	28	66.7	
A	7	16.7	
N	3	7.1	59.19
DA	2	4.8	
SDA	2	4.8	
Total	42	100.0	

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.1.25 show that, out of all the participants, 66.7% of the respondent teachers strongly agreed, and 16.7% of the respondent teachers agreed that they found updated access of ICT facilities in their school/library to be accessible. On the other hand, 7.1% of the respondent teachers remained neutral, 4.8% of the respondent teachers disagreed, and similarly 4.8% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (59.19) at 0.05 levels. Therefore, it is clear evident that majority of the teachers found updated access of ICT facilities in their school/library to be accessible.

Table 4.1.26

There are a variety of digital tools to be accessible in the school's lab.(Digital Library, Zoom, and Google Meet)

Scale	Frequency	Percent	Chi-Square	
SA	18	42.9		
A	7	16.7		
N	2	4.8		16.33
DA	8	19.0		
SDA	7	16.7		
Total	42	100.0		

Significant df=4, $X^{2\ at}$ p-value 0.05 = .003

The results presented in the table 4.1.26 show that, out of all the participants, 42.9% of the respondent teachers strongly agreed, and 16.7% of the respondent teachers agreed that there is a variety of digital tools that are accessible in the school's lab (Digital Library, Zoom, and Google Meet). On the other hand, 4.8% of the respondent teachers remained neutral, 19% of the respondent teachers disagreed, and similarly 16.7% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.003) of chi square was also greater than the calculated value (16.33) at 0.05 levels. Therefore, it is clear evident that response from the teachers was mixed about the viability of a variety of digital tools that are accessible in the school's lab (Digital Library, Zoom, and Google Meet).

Table 4.1.27

I have regular access to internet connectivity for educational purposes at school.

Scale	Frequency	Percent	Chi-Square	
SA	29	69.0		
A	5	11.9		
N	2	4.8		63.95
DA	4	9.5		
SDA	2	4.8		
Total	42	100.0		

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.1.27 show that, out of all the participants, 69% of the respondent teachers strongly agreed, and 11.9% of the respondent teachers agreed that they had regular access to internet connectivity for educational purposes at school. On the other hand, 4.8% of the respondent teachers remained neutral, 9.5% of the respondent teachers disagreed, and similarly 4.8% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (63.95) at 0.05 levels. Therefore, it is clearly evident that majority of the teachers had regular access to internet connectivity for educational purposes at school.

Table 4.1.28

have enough access to my files & Folders that I can share with my fellows for learning perspective.

Scale	Frequency	Percent	Chi-Square	
SA	26	61.9		
A	6	14.3		
N	4	9.5		46.81
DA	3	7.1		
SDA	3	7.1		
Total	42	100.0		
Significant df=4,		$X^{2\ at}$ p-value 0.05 = .000		

The results presented in the table 4.1.28 show that, out of all the participants, 61.9% of the respondent teachers strongly agreed, and 14.3% of the respondent teachers agreed that they had enough access to their files & folders that they can share with their fellows for learning perspective. On the other hand, 9.5% of the respondent teachers remained neutral, 7.1% of the respondent teachers disagreed, and similarly 7.1% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (46.81) at 0.05 levels. Therefore, it is clear evident that majority of the teachers had enough access to their files & folders that they can share with their fellows for learning perspective.

Table 4.1.29

We have proper access to our E-Classrooms.

Scale	Frequency	Percent	Chi-Square
SA	14	33.3	
A	8	19.0	
N	3	7.1	8.71
DA	6	14.3	
SDA	11	26.2	
Total	42	100.0	

Significant df=4, $X^{2\ at}$ p-value 0.05 = .069

The results presented in the table 4.1.29 show that, out of all the participants, 33.3% of the respondent teachers strongly agreed, and 19% of the respondent teachers agreed that they had proper access to our E-Classrooms. On the other hand, 7.1% of the respondent teachers remained neutral, 14.3% of the respondent teachers disagreed, and similarly 26.2% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (8.71) at 0.05 levels. Therefore, it is revealed that majority of the teachers had proper access to our E-Classrooms.

Table 4.1.30

Overall, the access to ICT facilities positively impacts the learning experience at the school

Scale	Frequency	Percent	Chi-Square
SA	29	69.0	
A	6	14.3	
N	2	4.8	64.42
DA	2	4.8	
SDA	3	7.1	
Total	42	100.0	

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.1.30 show that, out of all the participants, 69% of the respondent teachers strongly agreed, and 14.3% of the respondent teachers agreed to the fact that access to ICT facilities positively impacts the learning experience at the school. On the other hand, 4.8% of the respondent teachers remained neutral, 4.8% of the respondent teachers disagreed, and similarly 7.1% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (64.42) at 0.05 levels. Therefore, it is clear evident that majority of the teachers believed that access to ICT facilities positively impacts the learning experience at the school.

Table 4.1.31

Accumulated Results of Teachers Responses

Points	rongly agreed	Agreed	Neutral	Disagreed	Strongly disagreed
Availability	79.5	8.3	1.2	13.05	2.4
Usability	77.3	7.15	3.65	5.37	7.0
Accessibility	71.4	23.8	3.2	11.1	6.36
Average	76.06667	13.08333	2.683333	9.84	5.253333

The results presented in the table 4.1.31 show that, out of all the participants, 76.06% of the respondent teachers strongly agreed, and 13% of the respondent teachers agreed, 2.68% of the respondent teachers remained neutral, 9.84% of the respondent teachers disagreed, while 5.25% of the respondent teachers strongly disagreed. Furthermore, the tabulated value (0.000) of chi square was also greater than the calculated value (276.93) at 0.05 levels. Therefore, it is clear from these results that majority of the teachers strongly agreed to the fact that their schools provided sufficient availability, usability, and accessibility of ICT facilities.

4.2 Analysis of Student Questionnaire

Table 4.2.1

The school has a dedicated computer lab with sufficient computers for students

Scale	Frequency	Percent
SA	145	67.4
A	28	13.0
N	19	8.8
DA	12	5.6
SDA	11	5.1
Total	215	100.0

Table 4.2.1 shows that, 67.4% of the respondents from students strongly agreed that their school had a dedicated computer lab with sufficient computers, while 13.0% of the remaining respondents also agreed to this. Furthermore, 8.8% of the total respondents remained neutral about this, and 8.8% of the total respondents from teachers disagreed to this. While the remaining 5.1% of the teachers strongly disagreed that their school labs did not have a dedicated computer lab and sufficient computers. In brief, majority of the students agreed that their schools did have dedicated labs and sufficient computers.

Table 4.2.2

The school provides internet access for both students and teachers.

Scale	Frequency	Percent
SA	146	67.9
A	27	12.6
N	10	4.7
DA	20	9.3
SDA	12	5.6
Total	215	100.0

The results presented in the table 4.2.2 show that, 67.9% of the respondent students strongly agreed, and 12.6% of the respondent students agreed to the fact that their school provided access to internet for the teachers as well as students. On the other hand, 4.7% of the respondents remained neutral, and 9.3% of the respondent teachers disagreed, while 5.6% of the respondent students strongly disagreed to this statement. So, it is evident from these results that most of the schools did have internet facility for teachers and students.

Table 4.2.3

The school has projectors in classrooms for teaching purposes

Scale	Frequency	Percent
SA	157	73.0
A	30	14.0
N	6	2.8
DA	10	4.7
SDA	12	5.6
Total	215	100.0

The results in the table 4.2.3 are showing that, 73.0% of the respondent students strongly agreed, and 14.0% of the respondent students agreed that their schools had projectors in their classrooms. On the other hand, 2.8% of the respondent students remained neutral, 4.7% of the respondent students disagreed, and 5.6% of the respondent students strongly disagreed to this statement. Again, there results also show that majority of the schools did have the above mentioned facilities.

Table 4.2.4

The school offers training programs for teachers.

Scale	Frequency	Percent
SA	146	67.9
A	31	14.4
N	15	7.0
DA	14	6.5
SDA	9	4.2
Total	215	100.0

The results of the table 4.2.4 show that, 67.9% of the respondent students strongly agreed, and 14.4% of the respondent students agreed that their schools offered training programs for the students. On the other hand, 7.0% of the respondent students remained neutral, 6.5% of the respondent students disagreed, and 4.2% of the respondent students strongly disagreed to this statement. Therefore, it is evident from these results that majority of the schools where data was collected, were offering training programs for their teachers.

Table 4.2.5

The school provides technical support for students and teachers when ICT issues arise

Scale	Frequency	Percent
SA	149	69.3
A	23	10.7
N	22	10.2
DA	10	4.7
SDA	11	5.1
Total	215	100.0

The results presented in the table 4.2.5 show that, out of all the participants, 69.3% of the respondent students strongly agreed, while 10.2% of the respondents showed as neutral and 10.7% of the respondent students agreed that their school provided the technical support to its teachers and students in case of any ICT issue. On the other hand, 5.1% of the respondent students strongly disagreed to this statement. Therefore, as it's evident from the above-mentioned results, majority of the school did offer ICT technical support to their teachers and students.

Table 4.2.6

The school values the integration of ICT as an essential part of the educational experience

Scale	Frequency	Percent
SA	134	62.3
A	40	18.6
N	15	7.0
DA	14	6.5
SDA	12	5.6
Total	215	100.0

The results presented in the table 4.2.6 show that, out of all the participants, 62.3% of the respondent teachers strongly agreed, and 18.6% of the respondent teachers agreed that their school considered integration of ICT as an integral part of their educational experience. On the other hand, 7.0% of the respondent teachers remained neutral, 6.5% of the respondent teachers disagreed, and 5.6% of the respondent teachers strongly disagreed to this statement. Therefore, it's evident from the above-mentioned results that majority of the schools considered ICT integration as an essential part of their educational activities.

Table 4.2.7

The school provides updated ICT equipment to the students

Scale	Frequency	Percent
SA	141	71.2
A	30	8.8
N	12	6.5
DA	20	7.0
SDA	12	6.5
Total	215	100.0

The results presented in the table 4.2.7 show that, out of all the participants, 71.2% of the respondent students strongly agreed, and 8.8% of the respondent students agreed that their school provided updated ICT equipment to the students. On the other hand, 6.5% of the respondent students remained neutral, 7.0% of the respondent students disagreed, and 6.5% of the respondent students strongly disagreed to this statement. Therefore, it's evident from the above-mentioned results that majority of the schools did provide updated ICT equipment to their students.

Table 4.2.8

Students are using enough time for solving their problems through the computer

Scale	Frequency	Percent
SA	141	65.6
A	30	14.0
N	12	5.6
DA	20	9.3
SDA	12	5.6
Total	215	100.0

The results presented in the table 4.2.8 show that, out of all the participants, 65.6% of the respondent students strongly agreed, and 14.0% of the respondent students agreed that their students use enough time for solving their problems through the use of computers. On the other hand, 5.6% of the respondent students remained neutral, 9.3% of the respondent students disagreed, and 5.6% of the respondent students strongly disagreed to this statement. Therefore, it's clear from the results that majority of the students in the selected schools were using computer to solve their problems.

Table 4.2.9

The computer teacher gives the proper space for each student in allocated time.

Scale	Frequency	Percent
SA	156	72.6
A	14	6.5
N	10	4.7
DA	20	9.3
SDA	15	7.0
Total	215	100.0

The results presented in the table 4.2.9 show that, out of all the participants, 72.6% of the respondent students strongly agreed, and 6.5% of the respondent students agreed that their school's computer teacher gave the proper space for each student in their allocated time. On the other hand, 4.7% of the respondent students remained neutral, 9.3% of the respondent students disagreed, and similarly 9.3% of the respondent students strongly disagreed to this statement. Therefore, it's evident from the above-mentioned results that majority of the computer school teachers gave the space for each student in their allocated time.

Table 4.2.10

The computer lab equipment is updated as per need

Scale	***Frequency***	***Percent***
SA	150	69.8
A	28	13.0
N	10	4.7
DA	12	5.6
SDA	15	7.0
Total	215	100.0

The results presented in the table 4.2.10 show that, out of all the participants, 69.8% of the respondent students strongly agreed, and 13.0% of the respondent students agreed that their school's computer lab equipment was up to date as per need. On the other hand, 4.7% of the respondent students remained neutral, 5.6% of the respondent students disagreed, and 7.0% of the respondent students strongly disagreed to this statement. Therefore, it's clear that majority of the schools did have updated computer labs.

Table 4.2.11

I regularly use ICT facilities, such as computers and the internet, for academic purposes

Scale	Frequency	Percent
SA	152	70.7
A	30	14.0
N	9	4.2
DA	15	7.0
SDA	9	4.2
Total	215	100.0

The results presented in the table 4.2.11 show that, out of all the participants, 70.7% of the respondent students strongly agreed, and 14% of the respondent students agreed that they regularly used ICT facilities, such as computers and internet, for academic purpose. On the other hand, 4.2% of the respondent students remained neutral, 7.0% of the respondent students disagreed, and similarly 4.2% of the respondent students strongly disagreed to this statement. Therefore, it's evident from the above-mentioned results that majority of the school teachers were regular users of ICT facilities.

Table 4.2.12

I find ICT facilities in my school/library easy to use.

Scale	Frequency	Percent
SA	145	67.4
A	30	14.0
N	13	6.0
DA	16	7.4
SDA	11	5.1
Total	215	100.0

The results presented in the table 4.2.12 show that, out of all the participants, 67.4% of the respondent students strongly agreed, and 14.0% of the respondent students agreed that their school's ICT facilities were easy to use and user friendly. On the other hand, 6.0% of the respondent students remained neutral, 7.4% of the respondent students disagreed, and 5.1% of the respondent students strongly disagreed to this statement. Therefore, it's clear that majority of the teachers found their school's ICT facilities easy to use and user friendly.

Table 4.2.13

I feel confident in using a variety of software

Scale	Frequency	Percent	Chi-Square
SA	139	64.7	
A	41	19.1	
N	18	8.4	284.60
DA	11	5.1	
SDA	6	2.8	
Total	215	100.0	

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.2.13 show that, out of all the participants, 64.7% of the respondent students strongly agreed, and 19.2% of the respondent students agreed that they were confident is using variety of software but 8.4% of the respondents seems neutral. On the other hand, 5.1% of the respondent students disagreed, and similarly 2.8% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was greater than calculated value (284.60) at 0.05 levels. Therefore, it clearly indicates that majority of the teachers were confident in using a variety of software.

Table 4.2.14

The ICT facilities at my school/library contribute positively to my overall learning experience

Scale	Frequency	Percent	Chi-Square	
SA	134	62.3		
A	42	19.5		
N	19	8.8		256.83
DA	12	5.6		
SDA	8	3.7		
Total	215	100.0		

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.2.14 show that, out of all the participants, 64.7% of the respondent students strongly agreed, and 19.5% of the respondent students agreed that the ICT facilities at their schools contributed positively to the learning experience. On the other hand, 8.8% of the respondent students remained neutral, 5.6% of the respondent students disagreed, and similarly 3.7% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was greater than the calculated value (256.83) at 0.05 levels. Therefore, it is clearly evident that the majority of the students believed that ICT facilities at their schools contributed positively to the learning experience.

Table 4.2.15

In my computer lab, enough digital tools are used for learning

Scale	Frequency	Percent	Chi-Square	
SA	60	27.9		
A	16	7.4		
N	9	4.2		86.51
DA	48	22.3		
SDA	82	38.1		
Total	215	100.0		

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.2.15 show that, out of all the participants, 27.9% of the respondent students strongly agreed, and 7.4% of the respondent students agreed that they used enough digital tools for learning in their computer labs and respondents 4.2% who are neutral. On the other hand, 22.3% of the respondent students disagreed, and 38.1% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was greater than the calculated value (86.51) at 0.05 levels. Therefore, it is clear that majority of the students stated that they were not used enough digital tools for learning in their computer labs.

Table 4.2.16

I use different tools like calendar and task Manager for preparing my exam schedule

Scale	Frequency	Percent	Chi-Square	
SA	94	43.7		
A	35	16.3		
N	43	20.0		83.48
DA	22	10.2		
SDA	21	9.8		
Total	215	100.0		

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.2.16 show that, out of all the participants, 43.7% of the respondent students strongly agreed, and 16.3% of the respondent students agreed that they used tools like digital calendar and task managers for preparing their exam schedule. On the other hand, 20.0% of the respondent students remained neutral, 10.2% of the respondent students disagreed, and 9.8% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was greater than the calculated value (83.48) at 0.05 levels. Therefore, it is clear that majority of the students did use digital tools like digital calendar and task managers for preparing their exam.

Table 4.2.17

I am using Google Drive for my assignments to be stored for a long time

Scale	Frequency	Percent	Chi-Square	
SA	148	68.8		
A	29	13.5		
N	20	9.3		327.76
DA	13	6.0		
SDA	5	2.3		
Total	215	100.0		

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.2.17 show that, out of all the participants, 68.8% of the respondent students strongly agreed, and 13.5% of the respondent students agreed that they were using Google Drive as a storage tool for assignments to be stored for a long time. On the other hand, 9.3% of the respondent students remained neutral, 6.0% of the respondent students disagreed, and 2.3% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was greater than the calculated value (327.76) at 0.05 levels. Therefore, it is clear that majority of the students did use did use Google Drive as a storage tool for assignments to be stored for a long time.

Table 4.2.18

Teachers were not used for instruction us with interactive board in computer lab

Scale	Frequency	Percent	Chi-Square
SA	139	64.7	
A	24	11.2	
N	24	11.2	270.27
DA	15	7.0	
SDA	13	6.0	
Total	215	100.0	

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.2.18 show that, out of all the participants, 64.7% of the respondent students strongly agreed, and 11.2% of the respondent students agreed that they were not using interactive board as a learning tool for instructions to be used for a long time. On the other hand, 11.2 % of the respondent students remained neutral, 7.0% of the respondent students disagreed, and 6.0% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was greater than the calculated value (270.27) at 0.05 levels. Therefore, it is clear that majority of the teachers did not use some time interactive board as an instructional tool for students.

Table 4.2.19

We are familiar with multimedia projector for our presentations

Scale	Frequency	Percent	Chi-Square
SA	153	71.2	
A	18	8.4	
N	23	10.7	354.65
DA	13	6.0	
SDA	8	3.7	
Total	215	100.0	

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.1.19 show that, out of all the participants, 71.2% of the respondent students strongly agreed, and 8.4% of the respondent students agreed that they were familiar with the use of projector for their presentations. On the other hand, 10.7% of the respondent students remained neutral, 6.0% of the respondent students disagreed, and similarly 3.7% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (354.65) at 0.05 levels. Therefore, it is clear evident that majority of the students were familiar with the use of projector for their presentations.

Table 4.2.20

We are using digital tools when classes are not possible due to any unavoidable circumstances (Zoom, Google Meets)

Scale	Frequency	Percent	Chi-Square	
SA	141	65.6		
A	29	13.5		
N	19	8.8		283.90
DA	9	4.2		
SDA	17	7.9		
Total	215	100.0		

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.2.20 show that, out of all the participants, 65.6% of the respondent students strongly agreed, and 13.5% of the respondent students agreed that they do use digital tools when classes are not possible due to unavoidable circumstances. On the other hand, 8.8% of the respondent students remained neutral, 4.2% of the respondent students disagreed, and similarly 7.9% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (283.90) at 0.05 levels. Therefore, it is clear that majority of the teachers were using digital platforms like Zoom and Google Meets for classes.

Table 4.2.21

I have regular access to a computer for educational purposes at school

Scale	Frequency	Percent	Chi-Square
SA	155	72.1	
A	26	12.1	
N	20	9.3	371.07
DA	6	2.8	
SDA	8	3.7	
Total	215	100.0	

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.2.21 show that, out of all the participants, 72.1% of the respondent students strongly agreed, and 12.1% of the respondent students agreed that they had regular access to a computer for educational purposes at school. On the other hand, 9.3% of the respondent students remained neutral, 2.8% of the respondent students disagreed, and similarly 3.7% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (371.07) at 0.05 levels. Therefore, it is clear evident that majority of the teachers had regular access to a computer for educational purposes at school.

Table 4.2.22

The school offers effective access to ICT resources for learning

Scale	Frequency	Percent	Chi-Square
SA	153	71.2	
A	40	18.6	
N	15	7.0	372.69
DA	6	2.8	
SDA	1	0.5	
Total	215	100.0	

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.2.22 show that, out of all the participants, 71.2% of the respondent teachers strongly agreed, and 18.6% of the respondent teachers agreed that their schools offered effective access to ICT resources for learning. On the other hand, 7.0% of the respondent teachers remained neutral, 2.8% of the respondent teachers disagreed, and similarly 0.5% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (372.69) at 0.05 levels. Therefore, it is clear evident that majority of the teachers reported that their schools offered effective access to ICT resources for learning.

Table 4.2.23

There is a variety of software accessible for educational purposes in the school's ICT lab

Scale	Frequency	Percent	Chi-Square
SA	131	60.9	
A	38	17.7	
N	21	9.8	235.30
DA	11	5.1	
SDA	14	6.5	
Total	215	100.0	

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.1.23 show that, out of all the participants, 60.9% of the respondent students strongly agreed, and 17.7% of the respondent students agreed that there was a variety of software accessible for educational purposes in the school's ICT lab. On the other hand, 9.8% of the respondent students remained neutral, 5.1% of the respondent students disagreed, and similarly 6.5% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (235.30) at 0.05 levels. Therefore, it is clearly evident that students reported that there is a variety of software accessible for educational purposes in the school's ICT lab.

Table 4.2.24

Easy Access to ICT facilities enhanced my academic performance at my school

Scale	Frequency	Percent	Chi-Square	
SA	140	65.1		
A	28	13.0		
N	15	7.0		276.93
DA	12	5.6		
SDA	20	9.3		
Total	215	100.0		

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.1.24 show that, out of all the participants, 65.1% of the respondent students strongly agreed, and 13.0% of the respondent students agreed that the easy access to ICT facilities enhanced their academic performance at their school. On the other hand, 7.0% of the respondent students remained neutral, 5.6% of the respondent students disagreed, and similarly 9.3% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (276.93) at 0.05 levels. Therefore, it is clear that majority of the students reported that the easy access to ICT facilities enhanced their academic performance at their school.

Table 4.2.25

I find updated Access of ICT facilities in my school/library to be accessible

Scale	Frequency	Percent	Chi-Square	
SA	31	14.4		
A	12	5.6		
N	10	4.7		149.62
DA	55	25.6		
SDA	107	49.8		
Total	215	100.0		

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.2.25 show that, out of all the participants, 14.4% of the respondent students strongly agreed, and 5.6% of the respondent students agreed that they found updated access of ICT facilities in their school/library to be accessible. On the other hand, 4.7% of the respondent students remained neutral, 25.6% of the respondent students disagreed, and similarly 49.8% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (149.62) at 0.05 levels. Therefore, it is clear evident that majority of the students found updated access of ICT facilities in their school/library not to be accessible.

Table 4.2.26

'here are a variety of digital tools to be accessible in the school's lab.(Digital Library, Zoom, and Google Meet)

Scale	Frequency	Percent	Chi-Square	
SA	150	69.8		
A	31	14.4		
N	19	8.8		341.72
DA	6	2.8		
SDA	9	4.2		
Total	215	100.0		

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.2.26 show that, out of all the participants, 69.8% of the respondent students strongly agreed, and 14.4% of the respondent students agreed that there is a variety of digital tools that are accessible in the school's lab (Digital Library, Zoom, and Google Meet). On the other hand, 8.8% of the respondent students remained neutral, 2.8% of the respondent students disagreed, and similarly 4.2% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.003) of chi square was also greater than the calculated value (341.72) at 0.05 levels. Therefore, it is clear evident that response from the students were mixed about the viability of a variety of digital tools that are accessible in the school's lab (Digital Library, Zoom, and Google Meet).

Table 4.2.27

I have regular access to internet connectivity for educational purposes at school

Scale	**Frequency**	**Percent**	**Chi-Square**	
A	7	3.3		
N	17	7.9		197.85
DA	53	24.7		
SDA	138	64.2		
Total	215	100.0		
Significant df=3,			$X^{2\ at}$ p-value 0.05 = .000	

The results presented in the table 4.2.27 show that, out of all the participants, 3.3% of the respondent students agreed, On the other hand, 7.9% of the respondent teachers remained neutral, 24.7% of the respondent students disagreed, and similarly 64.2% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (197.85) at 0.05 levels. Therefore, it is clearly evident that majority of the students had not regular access to internet connectivity for educational purposes at school

Table 4.2.28

I have enough access to my files & Folders that I can share with my fellows for learning perspective

Scale	Frequency	Percent	Chi-Square
SA	150	69.8	
A	30	14.0	
N	14	6.5	338.88
DA	11	5.1	
SDA	10	4.7	
Total	215	100.0	

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.2.28 show that, out of all the participants, 69.8% of the respondent students strongly agreed, and 14.0% of the respondent students agreed that they had enough access to their files & folders that they can share with their fellows for learning perspective. On the other hand, 6.5% of the respondent students remained neutral, 5.1% of the respondent students disagreed, and similarly 4.7% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (338.88) at 0.05 levels. Therefore, it is clear evident that majority of the students had enough access to their files & folders that they can share with their fellows for learning perspective.

Table 4.2.29

We have proper access to our E-Classrooms

Scale	Frequency	Percent	Chi-Square
SA	26	12.1	
A	29	13.5	
N	14	6.5	136.37
DA	36	16.7	
SDA	110	51.2	
Total	215	100.0	

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.2.29 show that, out of all the participants, 12.1% of the respondent students strongly agreed, and 13.5% of the respondent students agreed that they had proper access to our E-Classrooms. On the other hand, 6.5% of the respondent students remained neutral, 16.7% of the respondent students disagreed, and similarly 51.2% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (8.71) at 0.05 levels. Therefore, it is revealed that majority of the students had no proper access to their E-Classrooms.

Table 4.2.30

Overall, the access to ICT facilities positively impacts the learning experience at the school

Scale	**Frequency**	**Percent**	
		Chi-Square	
SA	163	75.8	
A	22	10.2	
N	4	1.9	422.79
DA	16	7.4	
SDA	10	4.7	
Total	215	100.0	

Significant df=4, $X^{2\ at}$ p-value 0.05 = .000

The results presented in the table 4.2.30 show that, out of all the participants, 75.8% of the respondent students strongly agreed, and 10.2% of the respondent students agreed to the fact that access to ICT facilities positively impacts the learning experience at the school. On the other hand, 1.9% of the respondent students remained neutral, 7.4% of the respondent students disagreed, and similarly 4.7% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (422.79) at 0.05 levels. Therefore, it is clear evident that majority of the students believed that access to ICT facilities positively impacts the learning experience at the school.

Table 4.2.31

Accumulated Results of ICT facilities from students

Points	rongly Agreed	Agreed	Neutral	Disagreed	Strongly disagreed
Availability	69.3	11.16	5	8.0	6.5
Usability	69.05	13.5	5.8	6.52	5.12
Access	67.6	15.7	6.2	6.5	4.0
Average	65.8	14.65	8.6	5.6	5.3

The results presented in the table 4.2.31 show that, out of all the participants, 65.8% of the respondent students strongly agreed, and 14.65% of the respondent teachers agreed, 8.6% of the respondent students remained neutral, 5.6% of the respondent students disagreed, while 5.3% of the respondent students strongly disagreed. Furthermore, the tabulated value (0.000) of chi square was also greater than the calculated value (276.93) at 0.05 levels. Therefore, it is clear from these results that majority of the students strongly agreed to the fact that their schools provided sufficient availability, usability, and access of ICT facilities.

CHAPTER 05

SUMMARY, FINDINGS, DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Summary

So it was revealed that the majority of the teachers & Students strongly agreed for the availability usability and accessibility of ICT facilities found in their place in a positive response on the basis of their responses while a smaller portion agreed or were neutral. A minority of teachers and students disagreed, and an even smaller percentage strongly disagreed. The study was about the available ICT facilities in the school environment for motivational purpose to attract students for learning. The study was to find out the availability of ICT facilities in boys & girls high schools of Rawalpindi also to investigate the access of Information Communication Technology facilities available in boys & girls high schools of Rawalpindi, determine the usage of Information Communication Technology facilities available in boys & girls high schools of Rawalpindi. Research design of this study was quantitative research. All girls & boys of high schools of Rawalpindi District was the target of Rawalpindi city & (6960) students consisting (3865) and (3095) respectively of class 9th and 10th and 348 Teachers consisting 186 female teachers and 162 male teachers and 174 Boys & Girls High Schools consisting of 81 Boys & 93 girls schools respectively of Rawalpindi city. Our sample of the study was comprised of 386 female students and 309 male students of class 9th and 10th and 32 male teachers of 17 Boys high Schools & 37 female teachers of 18 girls' high schools of Rawalpindi city. Due to limited time and financial constraints, convenient sampling technique was used to distribute one

Questionnaire that used as a research instruments, each for teachers and students. With the help of experts and personal experiences validity was checked by the related researches in the field.

Through SPSS Split-half testing was used for reliability of questionnaire, for data collection from the targeted schools, questionnaire was used by personal visit. Before distribution of questionnaires among respondents after appropriate sessions were taken from Principal, Education Officers, heads, teachers and students of the concerned schools. For those respondents who were unable to respond at the spot, researcher was visited school twice for getting data. Data were collected by using closed ended questionnaire. It was quantitative study. SPSS (Version, 24) was used for data analysis of the study.

5.2 Findings of the Study

The major results of this present study consisting of students' and teacher's responses on the availability, usability and access of ICT equipment in their school environment within the Computer labs provided by school administration.

5.2.1 Findings from the students and teachers

Objective No.1: To find out the availability of ICT equipment among students and teachers in boys & girls high schools of Rawalpindi.

1. The results presented in Table 4.1.1 shows that, 81.0% of the respondents from teachers strongly agreed that their school had a dedicated computer lab with sufficient computers, while 4.8% of the remaining respondents also agreed to this. Furthermore, 4.8% of the total respondents remained neutral about this, and 4.8% of the total respondents from teachers disagreed to this. While the remaining 4.8% of the teachers

strongly disagreed that their school labs did not have a dedicated computer lab and sufficient computers. In brief, majority of the teachers agreed that their schools did have dedicated labs and sufficient computers.

In Table 4.2.1 shows that, 67.4% of the respondents from students strongly agreed that their school had a dedicated computer lab with sufficient computers, while 13.0% of the remaining respondents also agreed to this. Furthermore, 8.8% of the total respondents remained neutral about this, and 8.8% of the total respondents from teachers disagreed to this. While the remaining 5.1% of the teachers strongly disagreed that their school labs did not have a dedicated computer lab and sufficient computers. In brief, majority of the students agreed that their schools did have dedicated labs and sufficient computers.

2. The results presented in the table 4.1.2 show that, 78.6% of the respondent teachers strongly agreed, and 11.9% of the respondent teachers agreed to the fact that their school provided access to internet for the teachers as well as students. On the other hand, 2.4% of the respondents remained neutral, and 4.8% of the respondent teachers disagreed, while 2.4% of the respondent teachers strongly disagreed to this statement. So, it is evident from these results that most of the schools did have internet facility for teachers and students.

   The results presented in the table 4.2.2 show that, 67.9% of the respondent students strongly agreed, and 12.6% of the respondent students agreed to the fact that their school provided access to internet for the teachers as well as students. On the other hand, 4.7% of the respondents remained neutral, and 9.3% of the respondent teachers disagreed, while 5.6% of the respondent students strongly disagreed to this statement.

So, it is evident from these results that most of the schools did have internet facility for teachers and students.

3. The results in the table 4.1.3 are showing that, 78.6% of the respondent teachers strongly agreed, and 4.8% of the respondent teachers agreed that their schools had interactive whiteboards and projectors in their classrooms. On the other hand, 4.8% of the respondent teachers remained neutral, 2.4% of the respondent teachers disagreed, and 9.5% of the respondent teachers strongly disagreed to this statement. Again, there results also show that majority of the schools did have the above mentioned facilities.

   The results in the table 4.2.3 are showing that, 73.0% of the respondent students strongly agreed, and 14.0% of the respondent students agreed that their schools had projectors in their classrooms. On the other hand, 2.8% of the respondent students remained neutral, 4.7% of the respondent students disagreed, and 5.6% of the respondent students strongly disagreed to this statement. Again, there results also show that majority of the schools did have the above mentioned facilities.

4. The results of the table 4.1.4 show that, 71.6% of the respondent teachers strongly agreed, and 7.1% of the respondent teachers agreed that their schools offered training programs for the teachers. On the other hand, 2.4% of the respondent teachers remained neutral, 9.5% of the respondent teachers disagreed, and 11.4% of the respondent teachers strongly disagreed to this statement. Therefore, it is evident from these results that majority of the schools where data was collected, were offering training programs for their teachers.

   The results of the table 4.2.4 show that, 67.9% of the respondent students strongly agreed, and 14.4% of the respondent students agreed that their schools offered training

programs for the students. On the other hand, 7.0% of the respondent students remained neutral, 6.5% of the respondent students disagreed, and 4.2% of the respondent students strongly disagreed to this statement. Therefore, it is evident from these results that majority of the schools where data was collected, were offering training programs for their teachers.

5. The results presented in the table 4.1.5 show that, out of all the participants, 83.3% of the respondent teachers strongly agreed, and 9.5% of the respondent teachers agreed that their school provided the technical support to its teachers and students in case of any ICT issue. On the other hand, 7.1% of the respondent teachers strongly disagreed to this statement. Therefore, as it's evident from the above-mentioned results, majority of the school did offer ICT technical support to their teachers and students.

   The results presented in the table 4.2.5 show that, out of all the participants, 69.3% of the respondent students strongly agreed, while 10.2% of the respondents showed as neutral and 10.7% of the respondent students agreed that their school provided the technical support to its teachers and students in case of any ICT issue. On the other hand, 5.1% of the respondent students strongly disagreed to this statement. Therefore, as it's evident from the above-mentioned results, majority of the school did offer ICT technical support to their teachers and students.

6. The results presented in the table 4.1.6 show that, out of all the participants, 76.1% of the respondent teachers strongly agreed, and 7.1% of the respondent teachers agreed that their school considered integration of ICT as an integral part of their educational experience. On the other hand, 2.4% of the respondent teachers remained neutral, 7.2% of the respondent teachers disagreed, and 4.8% of the respondent teachers strongly

disagreed to this statement. Therefore, it's evident from the above-mentioned results that majority of the schools considered ICT integration as an essential part of their educational activities.

The results presented in the table 4.2.6 show that, out of all the participants, 62.3% of the respondent teachers strongly agreed, and 18.6% of the respondent teachers agreed that their school considered integration of ICT as an integral part of their educational experience. On the other hand, 7.0% of the respondent teachers remained neutral, 6.5% of the respondent teachers disagreed, and 5.6% of the respondent teachers strongly disagreed to this statement. Therefore, it's evident from the above-mentioned results that majority of the schools considered ICT integration as an essential part of their educational activities.

7. The results presented in the table 4.1.7 show that, out of all the participants, 66.6% of the respondent teachers strongly agreed, and 7.1% of the respondent teachers agreed that their school provided updated ICT equipment to the students. On the other hand, 2.4% of the respondent teachers remained neutral, 19% of the respondent teachers disagreed, and 4.8% of the respondent teachers strongly disagreed to this statement. Therefore, it's evident from the above-mentioned results that majority of the schools did provide updated ICT equipment to their students.

   The results presented in the table 4.2.7 show that, out of all the participants, 71.2% of the respondent students strongly agreed, and 8.8% of the respondent students agreed that their school provided updated ICT equipment to the students. On the other hand, 6.5% of the respondent students remained neutral, 7.0% of the respondent students disagreed, and 6.5% of the respondent students strongly disagreed to this statement.

Therefore, it's evident from the above-mentioned results that majority of the schools did provide updated ICT equipment to their students.

8. The results presented in the table 4.1.8 show that, out of all the participants, 76.2% of the respondent teachers strongly agreed, and 11.9% of the respondent teachers agreed that their students use enough time for solving their problems through the use of computers. On the other hand, 2.4% of the respondent teachers remained neutral, 4.8% of the respondent teachers disagreed, and 4.8% of the respondent teachers strongly disagreed to this statement. Therefore, it's clear from the results that majority of the students in the selected schools were using computer to solve their problems.

   The results presented in the table 4.2.8 show that, out of all the participants, 65.6% of the respondent students strongly agreed, and 14.0% of the respondent students agreed that their students use enough time for solving their problems through the use of computers. On the other hand, 5.6% of the respondent students remained neutral, 9.3% of the respondent students disagreed, and 5.6% of the respondent students strongly disagreed to this statement. Therefore, it's clear from the results that majority of the students in the selected schools were using computer to solve their problems.

9. The results presented in the table 4.1.9 show that, out of all the participants, 71.4% of the respondent teachers strongly agreed, and 4.8% of the respondent teachers agreed that their school's computer teacher gave the proper space for each student in their allocated time. On the other hand, 4.8% of the respondent teachers remained neutral, 9.5% of the respondent teachers disagreed, and similarly 9.5% of the respondent teachers strongly disagreed to this statement. Therefore, it's evident from the above-

mentioned results that majority of the computer school teachers gave the space for each student in their allocated time.

The results presented in the table 4.2.9 show that, out of all the participants, 72.6% of the respondent students strongly agreed, and 6.5% of the respondent students agreed that their school's computer teacher gave the proper space for each student in their allocated time. On the other hand, 4.7% of the respondent students remained neutral, 9.3% of the respondent students disagreed, and similarly 9.3% of the respondent students strongly disagreed to this statement. Therefore, it's evident from the above-mentioned results that majority of the computer school teachers gave the space for each student in their allocated time.

10. The results presented in the table 4.1.10 show that, out of all the participants, 59.5% of the respondent teachers strongly agreed, and 16.7% of the respondent teachers agreed that their school's computer lab equipment was up to date as per need. On the other hand, 11.9% of the respondent teachers remained neutral, 7.1% of the respondent teachers disagreed, and 4.8% of the respondent teachers strongly disagreed to this statement. Therefore, it's clear that majority of the schools did have updated computer labs.

    The results presented in the table 4.2.10 show that, out of all the participants, 69.8% of the respondent students strongly agreed, and 13.0% of the respondent students agreed that their school's computer lab equipment was up to date as per need. On the other hand, 4.7% of the respondent students remained neutral, 5.6% of the respondent students disagreed, and 7.0% of the respondent students strongly disagreed to this

statement. Therefore, it's clear that majority of the schools did have updated computer labs.

So it was revealed that the majority of the teachers & students strongly agreed for the availability of ICT facilities found in their school as per the above results on the basis of their responses.

Objective No.2: To examine the usage of Information Communication Technology facilities available in boys & girls high schools of Rawalpindi.

11. The results presented in the table 4.1.11 show that, out of all the participants, 66.7% of the respondent teachers strongly agreed, and 19% of the respondent teachers agreed that they regularly used ICT facilities, such as computers and internet, for academic purpose. On the other hand, 4.8% of the respondent teachers remained neutral, 7.1% of the respondent teachers disagreed, and similarly 2.4% of the respondent teachers strongly disagreed to this statement. Therefore, it's evident from the above-mentioned results that majority of the school teachers were regular users of ICT facilities.

    The results presented in the table 4.2.11 show that, out of all the participants, 70.7% of the respondent students strongly agreed, and 14% of the respondent students agreed that they regularly used ICT facilities, such as computers and internet, for academic purpose. On the other hand, 4.2% of the respondent students remained neutral, 7.0% of the respondent students disagreed, and similarly 4.2% of the respondent students strongly disagreed to this statement. Therefore, it's evident from the above-mentioned results that majority of the school teachers were regular users of ICT facilities.
12. The results presented in the table 4.1.12 show that, out of all the participants, 76.2% of the respondent teachers strongly agreed, and 14.3% of the respondent teachers agreed

that their school's ICT facilities were easy to use and user friendly. On the other hand, 2.4% of the respondent teachers remained neutral, 2.4% of the respondent teachers disagreed, and 4.8% of the respondent teachers strongly disagreed to this statement. Therefore, it's clear that majority of the teachers found their school's ICT facilities easy to use and user friendly.

The results presented in the table 4.2.12 show that, out of all the participants, 67.4% of the respondent students strongly agreed, and 14.0% of the respondent students agreed that their school's ICT facilities were easy to use and user friendly. On the other hand, 6.0% of the respondent students remained neutral, 7.4% of the respondent students disagreed, and 5.1% of the respondent students strongly disagreed to this statement. Therefore, it's clear that majority of the teachers found their school's ICT facilities easy to use and user friendly.

13. The results presented in the table 4.1.13 show that, out of all the participants, 73.8% of the respondent teachers strongly agreed, and 11.9% of the respondent teachers agreed that they were confident is using variety of software. On the other hand, 9.5% of the respondent teachers disagreed, and similarly 4.8% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was greater than calculated value (38.53) at 0.05 levels. Therefore, it clearly indicates that majority of the teachers were confident in using a variety of software.

    The results presented in the table 4.2.13 show that, out of all the participants, 64.7% of the respondent students strongly agreed, and 19.2% of the respondent students agreed that they were confident is using variety of software but 8.4% of the respondents seems neutral. On the other hand, 5.1% of the respondent students disagreed, and similarly

2.8% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was greater than calculated value (284.60) at 0.05 levels. Therefore, it clearly indicates that majority of the teachers were confident in using a variety of software.

14. The results presented in the table 4.1.14 show that, out of all the participants, 83.3% of the respondent teachers strongly agreed, and 9.5% of the respondent teachers agreed that the ICT facilities at their schools contributed positively to the learning experience. On the other hand, 2.4% of the respondent teachers remained neutral, 2.4% of the respondent teachers disagreed, and similarly 2.4% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was greater than the calculated value (106.09) at 0.05 levels. Therefore, it is clearly evident that the majority of the teachers believed that ICT facilities at their schools contributed positively to the learning experience

    The results presented in the table 4.2.14 show that, out of all the participants, 64.7% of the respondent students strongly agreed, and 19.5% of the respondent students agreed that the ICT facilities at their schools contributed positively to the learning experience. On the other hand, 8.8% of the respondent students remained neutral, 5.6% of the respondent students disagreed, and similarly 3.7% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was greater than the calculated value (256.83) at 0.05 levels. Therefore, it is clearly evident that the majority of the students believed that ICT facilities at their schools contributed positively to the learning experience.

15. The results presented in the table 4.1.15 show that, out of all the participants, 73.8% of the respondent teachers strongly agreed, and 14.3% of the respondent teachers agreed that they used enough digital tools for learning in their computer labs. On the other hand, 7.1% of the respondent teachers disagreed, and 4.8% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was greater than the calculated value (54.19) at 0.05 levels. Therefore, it is clear that majority of the teachers stated that they used enough digital tools for learning in their computer labs.

    The results presented in the table 4.2.15 show that, out of all the participants, 27.9% of the respondent students strongly agreed, and 7.4% of the respondent students agreed that they used enough digital tools for learning in their computer labs and respondents 4.2% who are neutral. On the other hand, 22.3% of the respondent students disagreed, and 38.1% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was greater than the calculated value (86.51) at 0.05 levels. Therefore, it is clear that majority of the students stated that they were not used enough digital tools for learning in their computer labs.

16. The results presented in the table 4.1.16 show that, out of all the participants, 66.7% of the respondent teachers strongly agreed, and 16.7% of the respondent teachers agreed that they used tools like digital calendar and task managers for preparing their exam schedule. On the other hand, 4.8% of the respondent teachers remained neutral, 7.1% of the respondent teachers disagreed, and 4.8% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was greater than the calculated value (59.19) at 0.05 levels. Therefore, it is clear that

majority of the teachers did use digital tools stated that they used enough digital tools like digital calendar and task managers for preparing their exam schedule.

The results presented in the table 4.2.16 show that, out of all the participants, 43.7% of the respondent students strongly agreed, and 16.3% of the respondent students agreed that they used tools like digital calendar and task managers for preparing their exam schedule. On the other hand, 20.0% of the respondent students remained neutral, 10.2% of the respondent students disagreed, and 9.8% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was greater than the calculated value (83.48) at 0.05 levels. Therefore, it is clear that majority of the students did use digital tools like digital calendar and task managers for preparing their exam.

17. The results presented in the table 4.1.17 show that, out of all the participants, 59.5% of the respondent teachers strongly agreed, and 16.7% of the respondent teachers agreed that they were using Google Drive as a storage tool for assignments to be stored for a long time. On the other hand, 9.5% of the respondent teachers remained neutral, 4.8% of the respondent teachers disagreed, and 9.5% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was greater than the calculated value (45.52) at 0.05 levels. Therefore, it is clear that majority of the teachers did use did use Google Drive as a storage tool for assignments to be stored for a long time.

    The results presented in the table 4.2.17 show that, out of all the participants, 68.8% of the respondent students strongly agreed, and 13.5% of the respondent students agreed that they were using Google Drive as a storage tool for assignments to be stored for a

long time. On the other hand, 9.3% of the respondent students remained neutral, 6.0% of the respondent students disagreed, and 2.3% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was greater than the calculated value (327.76) at 0.05 levels. Therefore, it is clear that majority of the teachers did use did use Google Drive as a storage tool for assignments to be stored for a long time

18. The results presented in the table 4.1.18 show that, out of all the participants, 33.3% of the respondent teachers strongly agreed, and 4.8% of the respondent teachers agreed that sometimes teachers were not used interactive board for instruction in the computer lab. On the other hand, 4.8% of the respondent teachers remained neutral, 19% of the respondent teachers disagreed, and 38.1% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (45.52) at 0.05 levels. Therefore, it is clear that majority of the teachers did not use interactive board for instruction in their computer labs.

    The results presented in the table 4.2.18 show that, out of all the participants, 64.7% of the respondent students strongly agreed, and 11.2% of the respondent students agreed that they were not using interactive board as a learning tool for instructions to be used for a long time. On the other hand, 11.2 % of the respondent students remained neutral, 7.0% of the respondent students disagreed, and 6.0% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was greater than the calculated value (270.27) at 0.05 levels. Therefore, it is clear that majority of the teachers did not use some time interactive board as an instructional tool for students.

19. The results presented in the table 4.1.19 show that, out of all the participants, 71.2% of the respondent students strongly agreed, and 8.4% of the respondent students agreed that they were familiar with the use of projector for their presentations. On the other hand, 10.7% of the respondent students remained neutral, 6.0% of the respondent students disagreed, and similarly 3.7% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (354.65) at 0.05 levels. Therefore, it is clear evident that majority of the students were familiar with the use of projector for their presentations.

    The results presented in the table 4.2.19 show that, out of all the participants, 71.2% of the respondent students strongly agreed, and 8.4% of the respondent students agreed that they were familiar with the use of projector for their presentations. On the other hand, 10.7% of the respondent students remained neutral, 6.0% of the respondent students disagreed, and similarly 3.7% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (354.65) at 0.05 levels. Therefore, it is clear evident that majority of the students were familiar with the use of projector for their presentations.

20. The results presented in the table 4.1.20 show that, out of all the participants, 71.4% of the respondent teachers strongly agreed, and 9.5% of the respondent teachers agreed that they do use digital tools when classes are not possible due to unavoidable circumstances. On the other hand, 2.4% of the respondent teachers remained neutral, 9.5% of the respondent teachers disagreed, and similarly 7.1% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (70.14) at 0.05 levels. Therefore,

it is clear that majority of the teachers were using digital platforms for classes when there were not possible familiar with the use of projector for their presentations.

The results presented in the table 4.2.20 show that, out of all the participants, 65.6% of the respondent students strongly agreed, and 13.5% of the respondent students agreed that they do use digital tools when classes are not possible due to unavoidable circumstances. On the other hand, 8.8% of the respondent students remained neutral, 4.2% of the respondent students disagreed, and similarly 7.9% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (283.90) at 0.05 levels. Therefore, it is clear that majority of the teachers were using digital platforms like Zoom and Google Meets for classes.

It was declared through the responses of the respondents that they can use easily their ICT facilities while studying in schools so we can say that the usability of ICT facilities found in their place are positive on the basis of their responses.

Objective No.3: To measure the access to Information Communication Technology facilities in boys & girls high schools of Rawalpindi.

21. The results presented in the table 4.1.21 show that, out of all the participants, 73.8% of the respondent teachers strongly agreed, and 9.5% of the respondent teachers agreed that they had regular access to a computer for educational purposes at school. On the other hand, 4.8% of the respondent teachers remained neutral, 7.1% of the respondent teachers disagreed, and similarly 4.8% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (76.33) at 0.05 levels. Therefore, it is clear evident that

majority of the teachers had regular access to a computer for educational purposes at school Table

The results presented in the table 4.2.21 show that, out of all the participants, 72.1% of the respondent students strongly agreed, and 12.1% of the respondent students agreed that they had regular access to a computer for educational purposes at school. On the other hand, 9.3% of the respondent students remained neutral, 2.8% of the respondent students disagreed, and similarly 3.7% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (371.07) at 0.05 levels. Therefore, it is clear evident that majority of the teachers had regular access to a computer for educational purposes at school.

22. The results presented in the table 4.1.22 show that, out of all the participants, 81.0% of the respondent teachers strongly agreed, and 9.5% of the respondent teachers agreed that their schools offered effective access to ICT resources for learning. On the other hand, 2.4% of the respondent teachers remained neutral, 4.8% of the respondent teachers disagreed, and similarly 2.4% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (98.23) at 0.05 levels. Therefore, it is clear evident that majority of the teachers reported that their schools offered effective access to ICT resources for learning.

    The results presented in the table 4.2.22 show that, out of all the participants, 71.2% of the respondent teachers strongly agreed, and 18.6% of the respondent teachers agreed that their schools offered effective access to ICT resources for learning. On the other

hand, 7.0% of the respondent teachers remained neutral, 2.8% of the respondent teachers disagreed, and similarly 0.5% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (372.69) at 0.05 levels. Therefore, it is clear evident that majority of the teachers reported that their schools offered effective access to ICT resources for learning.

23. The results presented in the table 4.1.23 show that, out of all the participants, 60.9% of the respondent students strongly agreed, and 17.7% of the respondent students agreed that there was a variety of software accessible for educational purposes in the school's ICT lab. On the other hand, 9.8% of the respondent students remained neutral, 5.1% of the respondent students disagreed, and similarly 6.5% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (235.30) at 0.05 levels. Therefore, it is clearly evident that students reported that there is a variety of software accessible for educational purposes in the school's ICT lab.

The results presented in the table 4.1.23 show that, out of all the participants, 60.9% of the respondent students strongly agreed, and 17.7% of the respondent students agreed that there was a variety of software accessible for educational purposes in the school's ICT lab. On the other hand, 9.8% of the respondent students remained neutral, 5.1% of the respondent students disagreed, and similarly 6.5% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (235.30) at 0.05 levels. Therefore, it is clearly

evident that students reported that there is a variety of software accessible for educational purposes in the school's ICT lab.

24. The results presented in the table 4.1.24 show that, out of all the participants, 65.1% of the respondent students strongly agreed, and 13.0% of the respondent students agreed that the easy access to ICT facilities enhanced their academic performance at their school. On the other hand, 7.0% of the respondent students remained neutral, 5.6% of the respondent students disagreed, and similarly 9.3% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (276.93) at 0.05 levels. Therefore, it is clear that majority of the students reported that the easy access to ICT facilities enhanced their academic performance at their school.

    The results presented in the table 4.2.24 show that, out of all the participants, 65.1% of the respondent students strongly agreed, and 13.0% of the respondent students agreed that the easy access to ICT facilities enhanced their academic performance at their school. On the other hand, 7.0% of the respondent students remained neutral, 5.6% of the respondent students disagreed, and similarly 9.3% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (276.93) at 0.05 levels. Therefore, it is clear that majority of the students reported that the easy access to ICT facilities enhanced their academic performance at their school.

25. The results presented in the table 4.1.25 show that, out of all the participants, 66.7% of the respondent teachers strongly agreed, and 16.7% of the respondent teachers agreed that they found updated access of ICT facilities in their school/library to be accessible.

On the other hand, 7.1% of the respondent teachers remained neutral, 4.8% of the respondent teachers disagreed, and similarly 4.8% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (59.19) at 0.05 levels. Therefore, it is clear evident that majority of the teachers found updated access of ICT facilities in their school/library to be accessible.

The results presented in the table 4.2.25 show that, out of all the participants, 14.4% of the respondent students strongly agreed, and 5.6% of the respondent students agreed that they found updated access of ICT facilities in their school/library to be accessible. On the other hand, 4.7% of the respondent students remained neutral, 25.6% of the respondent students disagreed, and similarly 49.8% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (149.62) at 0.05 levels. Therefore, it is clear evident that majority of the students found updated access of ICT facilities in their school/library not to be accessible.

26. The results presented in the table 4.1.26 show that, out of all the participants, 42.9% of the respondent teachers strongly agreed, and 16.7% of the respondent teachers agreed that there is a variety of digital tools that are accessible in the school's lab (Digital Library, Zoom, and Google Meet). On the other hand, 4.8% of the respondent teachers remained neutral, 19% of the respondent teachers disagreed, and similarly 16.7% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.003) of chi square was also greater than the calculated value (16.33) at 0.05 levels. Therefore, it is clear evident that response from the teachers was mixed about the

viability of a variety of digital tools that are accessible in the school's lab (Digital Library, Zoom, and Google Meet).

The results presented in the table 4.2.26 show that, out of all the participants, 69.8% of the respondent students strongly agreed, and 14.4% of the respondent students agreed that there is a variety of digital tools that are accessible in the school's lab (Digital Library, Zoom, and Google Meet). On the other hand, 8.8% of the respondent students remained neutral, 2.8% of the respondent students disagreed, and similarly 4.2% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.003) of chi square was also greater than the calculated value (341.72) at 0.05 levels. Therefore, it is clear evident that response from the students were mixed about the viability of a variety of digital tools that are accessible in the school's lab (Digital Library, Zoom, and Google Meet).

27. The results presented in the table 4.1.27 show that, out of all the participants, 69% of the respondent teachers strongly agreed, and 11.9% of the respondent teachers agreed that they had regular access to internet connectivity for educational purposes at school. On the other hand, 4.8% of the respondent teachers remained neutral, 9.5% of the respondent teachers disagreed, and similarly 4.8% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (63.95) at 0.05 levels. Therefore, it is clearly evident that majority of the teachers had regular access to internet connectivity for educational purposes at school.

The results presented in the table 4.2.27 show that, out of all the participants, 3.3% of the respondent students agreed, On the other hand, 7.9% of the respondent teachers

remained neutral, 24.7% of the respondent students disagreed, and similarly 64.2% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (197.85) at 0.05 levels. Therefore, it is clearly evident that majority of the students had not regular access to internet connectivity for educational purposes at school

28. The results presented in the table 4.1.28 show that, out of all the participants, 61.9% of the respondent teachers strongly agreed, and 14.3% of the respondent teachers agreed that they had enough access to their files & folders that they can share with their fellows for learning perspective. On the other hand, 9.5% of the respondent teachers remained neutral, 7.1% of the respondent teachers disagreed, and similarly 7.1% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (46.81) at 0.05 levels. Therefore, it is clear evident that majority of the teachers had enough access to their files & folders that they can share with their fellows for learning perspective.

    The results presented in the table 4.2.28 show that, out of all the participants, 69.8% of the respondent students strongly agreed, and 14.0% of the respondent students agreed that they had enough access to their files & folders that they can share with their fellows for learning perspective. On the other hand, 6.5% of the respondent students remained neutral, 5.1% of the respondent students disagreed, and similarly 4.7% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (338.88) at 0.05 levels. Therefore, it is clear evident that majority of the students had enough access to their files & folders that they can share with their fellows for learning perspective.

29. The results presented in the table 4.1.29 show that, out of all the participants, 33.3% of the respondent teachers strongly agreed, and 19% of the respondent teachers agreed that they had proper access to our E-Classrooms. On the other hand, 7.1% of the respondent teachers remained neutral, 14.3% of the respondent teachers disagreed, and similarly 26.2% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (8.71) at 0.05 levels. Therefore, it is revealed that majority of the teachers had proper access to our E-Classrooms.

    The results presented in the table 4.2.29 show that, out of all the participants, 12.1% of the respondent students strongly agreed, and 13.5% of the respondent students agreed that they had proper access to our E-Classrooms. On the other hand, 6.5% of the respondent students remained neutral, 16.7% of the respondent students disagreed, and similarly 51.2% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (8.71) at 0.05 levels. Therefore, it is revealed that majority of the students had no proper access to their E-Classrooms.

30. The results presented in the table 4.1.30 show that, out of all the participants, 69% of the respondent teachers strongly agreed, and 14.3% of the respondent teachers agreed to the fact that access to ICT facilities positively impacts the learning experience at the school. On the other hand, 4.8% of the respondent teachers remained neutral, 4.8% of the respondent teachers disagreed, and similarly 7.1% of the respondent teachers strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (64.42) at 0.05 levels. Therefore, it is clear

evident that majority of the teachers believed that access to ICT facilities positively impacts the learning experience at the school.

The results presented in the table 4.2.30 show that, out of all the participants, 75.8% of the respondent students strongly agreed, and 10.2% of the respondent students agreed to the fact that access to ICT facilities positively impacts the learning experience at the school. On the other hand, 1.9% of the respondent students remained neutral, 7.4% of the respondent students disagreed, and similarly 4.7% of the respondent students strongly disagreed to this statement. Moreover, the tabulated value (0.000) of chi square was also greater than the calculated value (422.79) at 0.05 levels. Therefore, it is clear evident that majority of the students believed that access to ICT facilities positively impacts the learning experience at the school.

So, the huge number of the teachers and students had positive responses against the access to ICT facilities with positive impact on the learning experience at the school.

5.3 Discussion

Those students who were not familiar with technology were gradually slowdown in the national and global economy. It means producing information in a digital way, as well as the critical use of innovative media with full participation in the community. It is also an important consideration for curriculum frameworks. In many countries, digital literacy is being built through the incorporation of information and communication technology (ICT) into schools. (Holroyd & Coates, 2015)

The most effective apps develop higher order thinking skills and provide creative and individualized options for students to express their understandings. Interactive white

boards allow projected computer images to be displayed, manipulated, dragged, clicked, or copied. Simultaneously, handwritten notes can be taken on the board and saved for later use. Interactive white boards are associated with whole-class instruction rather than student centered activities. Student engagement is generally higher when ICT is available for student use throughout the classroom. (Walling, 2014)

E-readers are electronic devices that can hold hundreds of books in digital form, and they are increasingly utilized in the delivery of reading material. Students—both skilled readers and reluctant readers had positive responses to the use of e-readers for independent reading. (Reed, 2018)

The actual purpose of this study was to investigate the availability of ICT facilities in the school environment that is one of the motivational forces that attract students to use those facilities for learning. The objectives of the study was to check the availability of ICT equipment among students and teachers in boys & girls high schools of Rawalpindi, How about the usage of Information Communication Technology facilities available in boys & girls high schools of Rawalpindi, to measure the access to Information Communication Technology facilities in boys & girls high schools of Rawalpindi.

The targeted audience was 6960 students where 3095 and 3865 male & female students respectively of class 9^{th} and 10^{th} and 348 Teachers consisting 186 and 162 female & male teachers respectively of all boys & girls schools of Rawalpindi city. (Mills & Gay, 2016)

The research work of other studies showed that the school administrators used ICT to a great extent. The local schools doesn't have lots of facilities but whatever they have, they used in a proper manner to the best of their need. The administration of any school benefited by the use of ICT by keeping the data of student admissions, exam marks, entry tests etc. It became easy with the use of ICT and with a single click all the data can be retrieved. Secondly communication with others like teachers and parents also became easy with ICT facility. School Management Committee (SMC) members were always in touch to give advice. In Present time all the schools are making salary bills in computerized way, which give relaxation to administration section. Presently all schools in rural and urban area are paying electricity bill, telephone bills and other bills by using ICT means. All the schools have WhatsAapp group to pass any kind of information among groups. It is revealed that most of the head of the school used computers which were provided in the ICT lab. Some of them used it in the lab itself or some of them kept one of them in their staff room. Very few head of the school got computer for administration purpose. One laptop was provided to very few head of the school, out of which, most of them were not in working condition. They were not having internet connection. If needed, internet availed by hotspot using their personal mobile. Administrators pointed out that they need laptop which they can carry with internet facilities. Most of the headmaster also suggested that government should enhance the overall ICT facilities in schools from computer lab to head of the school's room for administration purpose as well.

5.4 Conclusions

It is decided that most of the respondents are in favor of following points which are as under:

1- The availability, usability and access of ICT facilities found in their place with positive responses on the basis of their responses while a smaller portion agreed or were neutral.

2- The availability of ICT facilities in the school environment that is one of the motivational factor that attract students to use the facilities for learning.

3- Use of ICT in the classroom increases the motivation of the students**,** showing more interest and becoming more involved in the areas they study.

It is also found that the most of the respondents are in favor of following points:

4- Concentration is the key of the success.

5- ICT develops concentration among the learners.

6- As compared to a normal lesson a lesson delivered through ICT is more interesting for the students.

7- ICT provides more motivation to the learners. It improves critical thinking skills of students.

8- It is stated that Commitment is important for the successful completion of a task. ICT improves learner's commitment to a task.

9- ICTs are used then students take more interest in the learning thus their commitment to the task also increases.

Some of the students & Teachers had generic opinion

10- Students & Teachers were generally more ‘on task’ and express more positive feelings when they use computers than when they are given other tasks to do. Enjoyment is important for the step in the learning process.

11- ICT gives enjoyment to the learners and makes learning fun. When ICTs are used then student at a time can visualize things and listen voice also. So, they enjoy learning because all their senses are activated at a time. Encouragement means to push or to give confidence.

12- Encouragement is important for the learning. ICT encourages learners and improves motivation.

13- ICT encourages students to understand multiple aspects of a topic. It gives productive knowledge to the learners. ICT motivates learners and provides them better understanding.

14- By using ICT, students can practice things to develop a connection with the real-life problem.

15- ICT develops learning by doing attitude among the learners. ICT allow learners to explore and discover things rather than merely listen and remember.

16- Students can practically perform a task by using ICT so they are active members and their curiosity in a learning task also improves.

17- ICT enhances the thinking and reasoning skills of the students and improves critical learning skills of the students.

18- By using ICT student can understand the multiple aspects of content. ICT allows students to reflect on a topic.

19- ICT makes learning fun for the students and improves the memorization ability of the students.

20- Students can easily pick up a task and easily perform it. It's easy for the students to learn things.

Students of the 21st century may retain more information, if it comes to them through a digital medium. ICT helps students in knowledge retention. Students can easily remember a lot of information without any difficulty. Miller, 2009

5.5 Recommendations

Each country in Millennium Development Goals (MDGs), in association with the private sector should make available the benefits of new technologies in education (United Nations, 2012).

Based on the findings and discussions presented in preceding chapters following recommendations are offered:

1. The school principals should play their role in promoting ICT in their school. Proper classes should be arranged for the students.

2. Proper timetable must be made. In that timetable class time should be separate from practical classes. There is no need to include theory and practical class timing together.

3. Theory class time can be of one hour and practical class time can be of at least two or three hours, so that the students can easily use the computers in the labs and can perform their practical work easily.

4. In the classroom teacher should try to use new technologies in the classroom so that students can learn more effectively and allow them to use it.

5. Computer subject teacher or IT teacher must know how to use computer in the classroom, what are the new technologies he or she can use and how can she or he use them.

6. If the teachers are comfortable in using laptop in the classroom then school's principal should allow her/him to use laptop in the classroom because laptop are more easy and simple to use them and they can easily carry them.

7. There must be a system of check and balance upon both teacher and students. Is teacher taking proper classes or not and is able to use new technologies in the classroom. And are students taking proper classes and are doing their work.

8. Teachers should try to display some videos in their class while giving lectures in classroom because video display will help them to understand lecture properly

9. There should be at least one day for online class to prepare for any unavoidable circumstances.

5.6 Future Research:

Following suggestions are given for future research regarding the present study:

1. Needs and challenges of ICT programs in Primary education in Pakistan may be focused for more clarity in reforms of ICT facilities. The study can be qualitative in nature. Participants of the study might be the senior ICT Teachers and Head Teachers.
2. A study may be conducted on the needs and challenges in establishing the virtual schooling systems in Pakistan. The study might be done by having mixed method in nature. The study will be supportive in comprehension of the existing needs and challenges in establishing virtual schooling in Pakistan.
3. A study may be conducted on the effectiveness of online education programs already running in the schools of Pakistan. The study may be mixed method approach in nature. Interviews and questionnaire may be the tool of research. The study may be important in understanding the effectiveness of online programs.

4. In Pakistani schooling system blending learning system may by introduced for better educational outcome. The study may be qualitative in nature. Unstructured interviews may be conducted by experts and professionals. The study may be important in understanding the existing practices of blended learning in the schools of Pakistan.

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List of Abbreviations

IT	Information Technology
ICT	Information Communication Technology
CT	Communication Technology
ICTs	Information Communication Technology
MDGs	Millennium Development Goals
SPSS	Statistical Package for the Social Sciences
Commodore PET	Commodore Personal Electronic Transistor
CAI	Computer Assisted Instruction"
OER	Open Educational Resources
LMS	Learning Management Systems
R&D	Research and Development

QUESTIONNAIRE FOR STUDENTS & TEACHERS

Dear Participant!

I am a student of **MS- Educational Leadership & Management (ELM)** Islamic International University Islamabad having **ID 433-FSS/MSEDU/F21**. Working on a research thesis from **International Islamic University Islamabad Pakistan Pakistan** titled as **"AVAILABILITY AND USED OF INFORMATION COMMUNICATION TECHNOLOGY AT HIGH SCHOOL OF RAWALPINDI DISTRICT".**

The questionnaire in hand has been selected for data collection purposes related to the variable of study.

You are requested to check the questionnaire parameters for validity according to my Topic mentioned above. The questionnaire refers to the Availability & usability towards facilities of ICT at your school.

On the basis of following Points

- **Strongly Agree (SA)**
- **Agree (A)**
- **Neutral (N)**
- **Disagree (D)**
- **Strongly Disagree (SD)**

Your responses will be kept confidential. The questionnaire is used to collect data for my MS research work only. Further, it is to assure you that contact information will be used only for the purpose of research. I am thankful for your feedback.

Yours Truly
Khalil ur Rehman Farooqui

Appendix-A

AVAILABILITY AND USED OF INFORMATION COMMUNICATION TECHNOLOGY AT HIGH SCHOOL OF RAWALPINDI DISTRICT

Student/Teacher Name (Optional)_____Class _____Section_____Gender M/F

Strongly Agree (SA), Agree (A), Neutral(N), Disagree (D), Strongly Disagree (SD)						
AVAILABILITY OF ICT EQUIPMENT						
1	The school has a dedicated computer lab with sufficient computers for students.					
2	The school provides internet access for both students and teachers.					
3	The school has interactive whiteboards or projectors in classrooms for teaching purposes.					
4	The school offers training programs for teachers to effectively use ICT in their teaching.					
5	The school provides technical support for students and teachers when ICT issues arise.					
6	The school values the integration of ICT as an essential part of the educational experience.					
7	The school provides updated ICT equipment to the students.					

8	Students are using enough time for solving their problems through the computer.					
9	The computer teacher gives the proper space for each student in allocated time.					
10	The computer lab equipment is updated as per need.					
	USAGE OF ICT FACILITIES					
11	I regularly use ICT facilities, such as computers and the internet, for academic purposes					
12	Found ICT facilities in my school/library easy to use.					
13	I feel confident in using a variety of software.					
14	The ICT facilities at my school/library contribute positively to my overall learning experience.					
1 5	In my computer lab, enough digital tools are used for learning.					
16	I use different tools like calendar and task Manager for preparing my exam schedule.					
17	I am using Google Drive for my assignments to be stored for a long time.					
18	Sometime teachers used for instruction us with interactive board in computer lab					

19	We are familiar with multimedia projector for our presentations.					
20	We are using digital tools when classes are not possible due to any unavoidable circumstances (Zoom, Google Meets)					
	ACCESS TO ICT FACILITIES					
21	I have regular access to a computer for educational purposes at school.					
22	The school offers effective access to ICT resources for learning.					
23	There is a variety of software accessible for educational purposes in the school's ICT lab.					
24	Easy Access to ICT facilities enhanced my academic performance at my school.					
25	find updated ICT facilities in my school/library to be accessible.					
26	ere are a variety of digital tools to be accessible in the school's lab.(Digital Library, Zoom, and Google Meet)					
27	have regular access to internet connectivity for educational purposes at school.					
28	ave enough access to my files & Folders that I can share with my fellows for learning perspective.					

29	We have proper access to our E-Classrooms.					
30	Overall, the access to ICT facilities positively impacts the learning experience at the school.					

Appendix B

List of experts who have validated/reviewed the questionnaire

1. Professor Dr. Muhammad Sarwar Dean Faculty of Education International Islamic University, Islamabad.

2. Prof. Dr. Azhar Mahmood, Associate Professor, Department of Education, International Islamic University, Islamabad.

3. Assistant Professor Dr Muhammad Zafar Iqbal Education Department Allama Iqbal Open University Islamabad

4. Professor Dr. Rehan Ahmed Raja (Department of Computer Science) Riphah International University Islamabad

5. Ms Sidra Naeem Senior Lecturer-ICT Islamabad Model College for Girls F-7/2 Islamabad

6. Mr Ali Gohar Senior Science Teacher-Computer Science Federal Government School Morgah Rawalpindi

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