ONLINE LEARNING DURING COVID-19 PANDEMIC

A STAKEHOLDER PERSPECTIVE

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CERTIFICATE

This is to certify that this thesis entitled **"Online Learning during COVID-19 Pandemic: A Stakeholder Perspective"** submitted by **Sana Habib Chaudhry** is accepted in its present form by the PIDE School of Social Sciences, Pakistan Institute of Development Economics (PIDE), Islamabad as satisfying the requirements for partial fulfillment of the degree in Master of Philosophy in Development Studies.

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AUTHOR'S DECLARATION

I **Sana Habib Chaudhry** hereby state that my M.Phil. thesis titled **Online Learning during COVID-19 Pandemic: A Stakeholder Perspective** is my own work and has not been submitted previously by me for taking any degree from Pakistan Institute of Development Economics or anywhere else in the country/world.

At any time if my statement is found to be incorrect even after my Graduation the university has the right to withdraw my degree.

Date: 8/4/2022

Signature of Student

Sana Habib Chaudhry

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ABSTRACT

Main purpose of this study was to investigate the barriers and challenges faced by teachers, parents, and children attending primary school being stakeholders of education system during E-learning period as a result of the unusual situation due to pandemic COVID-19. Study was carried out in both Public and Private, Primary Schools of Rawalpindi and Islamabad. Quantitative research method was adopted and both descriptive and inferential research approach were used to meet the objective. Two separate questionnaires were designed for covering the perspective of parents / children and teachers, Information from 100(95) x teachers and 200 (183) x parents/children has been collected and analyzed.

Parental supervision and education found important dimensions of child education during the pandemic. Findings of study indicated that child learning decreased with the teachers' feedback to a child's parent as the teachers' intimated the parents about a child's non-seriousness or lack of participation during their distant learning period.

Children learning found better in schools that adopted online classes or shared learning material through WhatsApp, both modes were mainly adopted by MFPS and HFPS. Public schools and LFPS mainly relied on assignments during the pandemic. Further those children who have a dedicated room for study have better learning outcomes as compared to those living in one room households.

Teachers identified more challenges related to technology that is quality of internet, regarding manitainace of social contact with children.

Keywords: Stakeholders, E-learning, Public and Private Schools, satisfaction, performance, new content, technology, social contact.

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LIST OF ABBREVIATION

COVID-19	Coronavirus disease of 2019
LFPS	Low Fee Private School
MFPS	Medium Fee Private School
HFPS	High Fee Private School
HIES	Household Integrated Economic Survey
PSLM	Pakistan Social and Living Standard Survey
HEC	Higher Education Commission
WB	World Bank
PC	Personal Computer
ICT	Information Communication Technology
LMS	Learning Management System
ICILS	International Computer and Information Literacy Study
MS Teams	Microsoft Teams
B. Ed.	Bachelors of Education
M.Ed.	Masters of Education
PTCL	Pakistan Telecommunication Company Ltd**.**

Online Learning during Pandemic COVID-19: A Stakeholder Perspective

CHAPTER 1
INTRODUCTION

1.1 Overview

The world was hit by the COVID-19 pandemic, which has considerably affected every sector of the economy (Fernando, 2020). Education sector has also been affected badly, as the conventional education system could not remain working and the educational institutions around the world shifted to unconventional education system (Myers, 2020). Educational institutions globally were closed due to strict lockdowns and the students had to stay at home and were unable to meet their teachers in person. (Tam & El-Azar, 2020). To establish mechanism, World Bank (WB) interacted with the education ministries of different countries around the world (approximately more than dozen) to ensure the maximum educational benefits that could be provided to students all around the world (World Bank, 2020). But, e-education system is technology dependent, and this technology dependency has sometimes made its use hard and inaccessible (Ractham & Chen, 2019). In Pakistan since March, like other countries of the world, the educational institutions had been closed due to COVID-19 pandemic. An online education system as an alternative was designed by Higher Education Commission (HEC) of Pakistan, which can reach each student's home (Ain, 2020). Sequel to this, HEC had also formed an Online Readiness Policy Guidance Note and Policy Guidelines for Universities.

For successful integration of an online component to any academic program, the first step should be identification of stakeholders. When projects are developed without full understanding of fundamental requirements, chances of failure will always be

there. Stakeholders may be the customers or end users of the product, the people who provide services, the people who receive services, or the people who review and evaluate a system. In short, everyone who has a relation to the system at hand is a stakeholder. Objective must be clear, understood and articulated in the beginning, so that full support and satisfaction of each stakeholder can be guaranteed. In the context of online education of primary school children, it is clear and obvious that teachers who are teaching the online courses, students who are taking it and parents, who are the facilitators would be the stakeholders (Bozkurt, 2012).

In Pakistan, education institutes and parents had faced different barriers and challenges. Parents, teachers and students were not trained enough for the online education / e-education. Moreover, they didn't not have enough resources / technologies, e.g., the internet service, cellular phones, android application gadgets, or laptops to use for the online classes. In a developing country like Pakistan, online education is a challenge where literacy rate is only 60 percent and 30 percent of children of age 5-16 years are already out of school.

1.2 Reference of PSLM Data

According to Pakistan Social and Living Standard Measurement Survey (PSLM) 2019-20 in Pakistan, only 12 percent household has been reported with computer, laptop and tablet whereas 33 percent household reported with internet facility; that are basic needs for taking online education. Percentage is higher in Urban areas as compared to rural areas as represented in figure 1.1.

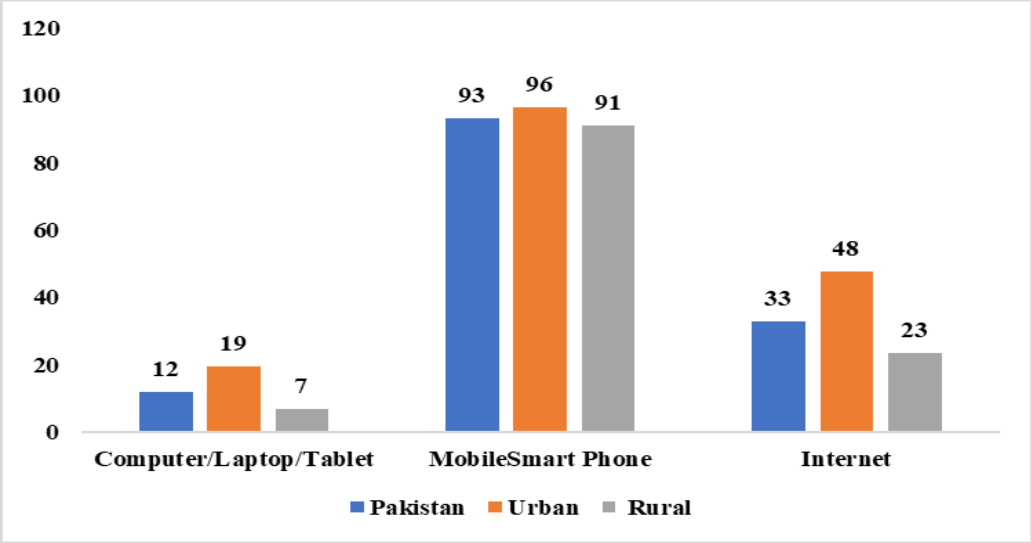


Figure1.1: Households with Computer, Mobile and Internet Facility

As during COVID-19, students were taking classes from home or to remain at home, for this parent must have good level of education as well as the parenting skills. The role of the parents is not only the monitoring the kids' temperament and their performance; but also, to satisfy their children's educational requirements as much effectively as possible. According to PSLM 2019-20 results in Pakistan, only 22 percent individuals of age 10 years and older who have used computer/Laptop in last three months i.e., only 5 percent have skills of connecting and installing devices. Moreover, 48 percent individuals can send an email.

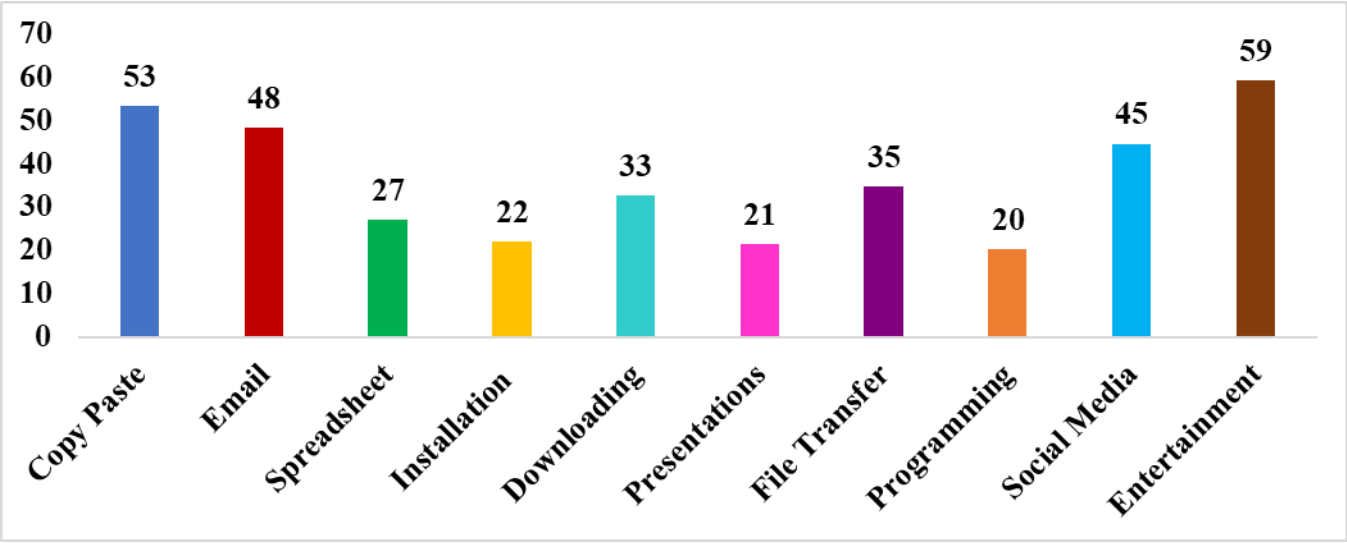


Figure: 1.2 Percentage of Individual with ICT Skills

In Pakistan, 64 percent population is enrolled in Primary Schools. The percentage is greater in urban areas with 70 percent as compared to 62 percent in rural areas. Whereas 68 percent Boys as compared to 60 percent girls are enrolled in primary schools Gap is evident from the Figure below. It is pertinent to mention here that only 17 percent of people are using internet according to HIES 2018-19 and according to PSLM 2019-20 this percentage increased to 19 percent.

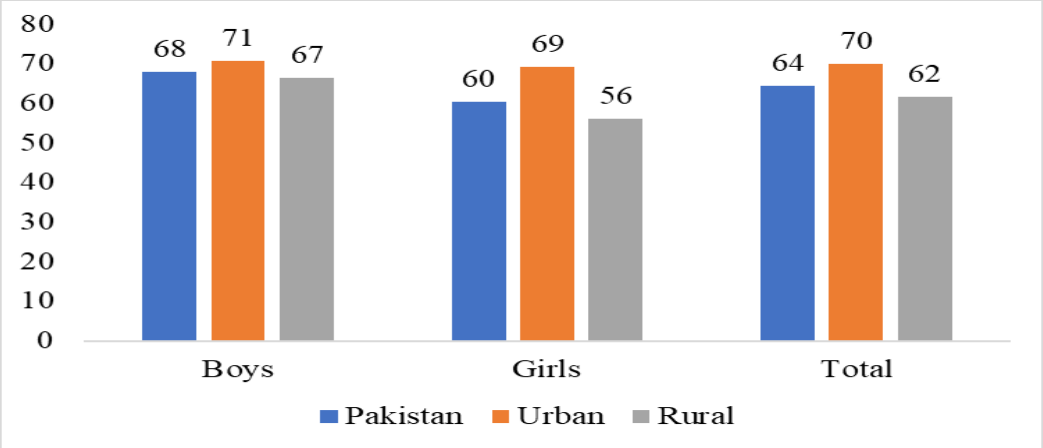


Figure: 1.3 Net Enrolments in Primary

The pandemic COVID-19 badly affected the education system and continuity of conventional learning, as all the educational institutes including public/private sector across Pakistan were directed to be closed immediately (since March 2020). Furthermore, due to emergency conditions, some educational institutes were also declared as isolation and quarantine centers. 19.1 Million Children are already out of schools and government is putting efforts to provide them educational access, whereas, 40 million school going children have been affected due to closure of education institutions due to COVID-19. This situation has increased the scale of the vulnerabilities and risks of an already weak education system. It is expected that the closure of education institutions will increase the gap further, in expected years of child schooling. Moreover, this disaster could magnify educational inequalities as a result of the economic collapse. So as a result of the ongoing pandemic, existing rural-urban, gender, and socio-economic differences will increase.

On the other hand, teachers also faced issues like preparedness and technological knowledge. Teachers, as the forefronts for online learning program execution, must

be able enough to meet the requirements for all instructional components; instructional methods include learning media applications, use of instructional time for usage of application, psychological and social factors which have impacts on teacher's motivation for online teaching. The teachers have the responsibilities which are not meant to transfer when the scenario change from face-to-face teaching and learning system to the online learning experiences; which they have not been realized before. So, a teacher must have to respond, to address and overwhelm all the problems that happens in an online learning system so that learning continues to achieve the targeted goals. This study highlighted the stakeholder's perceptions of parents and primary school teachers and learners for online learning system and the impact of pandemic on primary school children's education in Pakistan.

1.3 Problem Statement

COVID-19 not only affected the economy of the whole world, but it also affected the education sector badly. Primary School children are the most affected group as they need full attention of teachers and parents. Development and grooming of the children must be the main role of primary education. This means that all the children are capable enough to develop their social, cultural, emotional, intellectual and physical skills according to the best of their abilities. But due to the school closure and for saving children and teachers from the infection, Prime Minister and Education Minister of Pakistan decided to provide online education, therefore, directed education boards and institutes for continuation of education by using the technology.

There was no exception in case of education, students from advantaged backgrounds, supported by their parents or elders, and have alternative means regarding learning opportunities when schools were closed. Whereas children from disadvantaged backgrounds often remained shutting out, when their schools were closed. This critical issue has exposed so many shortcomings and discriminations in our learning and education systems, including misalignment between resources and requirements. For online education, access to the good Quality internet facilities and devices including PCs/laptops smart phones are required. Privacy is also required to

emphasize on the learning.

As the educational society and groups have made rigorous efforts to sustain learning activity during this period, Parents and students have more dependence on their personal resources to sustain the learning activity remotely through the World Wide Web or Internet, TV or radio. Instructors also have to adjust with new teaching concepts and styles or delivery methods of teaching, for which they may not get any trainings in the past. In this scenario, especially to engage Primary School children and to satisfy their parents, was challenging for the teachers.

In this research, challenges and barriers experienced by stakeholders including parents, primary school children and teachers of both Public Schools and Private Schools of Rawalpindi and Islamabad have been explored. This study has also covered the parents and teachers' management of education of primary school-age children during the outbreak of COVID-19 and children perspective has also been considered. It is expected that Government, school administrators and even scholars & teachers will be able to utilize the suggestions and information presented in this study to improve the learning capability and students' performance. Furthermore, an understanding of the obstructions and barriers faced by the parents, children and teachers will be helpful to develop an efficient environment for online education system in future, in Pakistan.

1.4 Objective of Research

This research will be helpful to highlight the impact of COVID-19 crisis and the consequences on schools and education. Main objectives of the study are:

- To investigate the barriers faced by the Parents of Primary School Children in the online education system.

- To investigate the level of satisfaction of Parents with the education of their children during COVID-19.
- To explore the barriers and challenges faced by Primary School Children / Learners and their learning outcome.
- To explore how Primary School teachers, sustain social connection with the students and their parents; apart from mastering the essential challenges of teaching (including provision of online lectures, presenting new learning content, giving feedback, taking students assessments) through online environments.

1.5 Research Gap

In Pakistan since March, the educational institutions had been closed due to COVID-19 pandemic. An online education system as an alternative was designed by Higher Education Commission (HEC) of Pakistan, which can reach each student's home. HEC had also formed an Online Readiness Policy Guidance Note and Policy Guidelines for Universities.

For successful integration of an online component to any academic program, the first step should be identification of stakeholders. When projects are developed without full understanding of fundamental requirements, chances of failure will always be there. Stakeholders may be the customers or end users of the product, the people who provide services, the people who receive services, or the people who review and evaluate a system. In short, everyone who has a relation to the system at hand is a stakeholder. Objective must be clear, understood and articulated in the beginning, so that full support and satisfaction of each stakeholder can be guaranteed. In the context of online education of primary school children, it is clear and obvious that teachers who are teaching the online courses, students who are taking it and parents, who are the facilitators would be the stakeholders, but it is observed from literature that in Pakistan previously no comprehensive study carried out to capture the perspective of parent, teachers and students being stakeholder of

primary school children education. Specifically, during Covid-19 it was imperative to analyze the perspective of stakeholders to identify the challenges and barriers faced by them.

CHAPTER 2
REVIEW OF LITERATURE

2.1 Online Education

Online education system is technology dependent system, for which mode of instructions depends on access and quality of internet and therefore student can get educational benefits from home (Kentnor, 2015). Distant learning is emerging field of learning with some complexities. According to McIsaac, Gunawardena and Jonassen, (1996), online education is nothing more than ideas adopted from conventional education system and applied on the students who are unable to contact instructor, in person. Contemporary definition of distant learning states that online education is a systematic process in which computer and internet technologies are created and flourished so that the knowledge can be communicated to people around world who are facing physical barriers (Sun & Chen, 2016). Online education is widespread in developed world due to technological advancement (Allen & Seaman, 2014). The access to the internet and flexibility of online programs have made it important and integral part of higher education (Luyt, 2013).

In Pakistan, problems of non-accessibility to internet and non-availability of electronic gadgets are generally faced. This situation has got more worsen after the advent of this global wave of COVID-19 pandemic, where the educational institutions around the Pakistan have been closed and they are pushed to adopt the distance learning online education system. However, this task was not easy, and all education institutions were facing diverse barriers and challenges while implementing the online education system.

2.1.1 Barriers and Challenges of the Online Education System

In post COVID-19 scenario, globally several empirical researches have been carried out to investigate barriers and challenges of the online education system. Some studies have identified emerging problems that put effects on online education quality like unavailability of technology, no proper communication, the lack of time management, online pedagogical issues, and issues in online student's evaluation (Mendes, Bastos, Amante, Aires & Cardoso, 2019; Blau, Shamir & Avdiel,2020). Other studies have identified barriers like e.g., social and administrative issues (Kebritchi et al., 2017); lack of training and skills and financial issues (Sun & Chen, 2016; (Deming et al., 2015); quality of education (Kentnor, 2015); and technical issues including non-availability of quality internet facilities, smart phones and laptops (Kaliisa & Picard, 2017).

The COVID-19 pandemic encountered teachers with extraordinary challenges regarding online teaching. Till March 2020, typical teaching in classroom was carried out by teachers according to timetables and decided syllabus was covered formally. Lipowsky (2015), highlighted that student have to listen to their teachers, class discussions were carried out, students worked individually or in groups, and assessed through physical exams. According to Helm and Huber (2020), the school closure due to lockdown because of pandemic put teachers, students, and parents in a completely new and challenging situation, as provision of education to children could only be possible by using unconventional alternative methods of teaching. Teachers adopted online teaching, by using technology and digital tools and approaches for making teaching affective. Gerick and Eickelmann (2020) highlighted main challenge for teacher while online teaching was to maintain social contact with their children for the social integration of learning groups.

Switching to online teaching due to COVID-19 was sudden and rapid, which carried out by wider ICT transformation process in educational systems (McFarlane 2019). Digitalization in schools is attaining prominence, now it is required to associate the school curriculum with ICT, and students should provide with opportunities to use

advanced technologies, tools and digital resources for creative and innovative problem solving. (Kozma 2011).

During COVID-19 period, according to guidelines of Education Ministry and HEC in Pakistan, children and parents have given access to resources and techniques used for distance learning from World Wide Web or internet. However, huge effort has been made by parents, teachers and children regarding online distance learning but there are still some challenges and barriers to distance learning. These barriers can create hindrances or obstacles for some groups from the utilization of distance learning. Therefore, it is important to visualize and determine the perceptions of teachers about parents and learners for these obstructions / barriers regarding distance learning so that the government and educational policy makers devise the solutions for removal of such barriers effecting parents and students from attaining good education.

Chauhan (2017), discussed that, evidence had suggested about digital technologies having potential to enable new opportunities for learning and teaching but technical infrastructure was also required for implementation. Not only access to computer technology hardware and software can guarantees the student progress, but ICT skills and teachers' support and encouragement also required for the use of digital tools. Li and Ma (2010), discussed that according to the findings of the International Computer and Information Literacy Study (ICILS) Germany, one third of eighth-grade students did not reach proficiency level 2, which indicated 'under-achievement in digital competence' (European Commission 2019, 11).

Smith and Lev-Ari (2005) highlighted that for provision of online education, high level agreement of teacher and student is required, furthermore, teaching abilities and skills are required to maintain the social contact. Allen and Wright (2014), argues that for distant learning more skills regarding teaching, including classroom management, are acquired. The teaching methodology also offers a meaningful communication and collaboration effort among teachers and learners that can contribute to boost the process of teaching and learning (Fuentes-Abeledo, 2020).

Baker et al. (2018), in his research explored the pedagogical concepts that could be applied by teachers by imparting training to the teachers regarding use of technology. It is important to observe and analyze the basic principles of teaching and learning and integrate the technology in educational frameworks.

There are different theories on the barriers and challenges of online education. For example, the E-Learning Theory has certain principals, like pre-training principle, redundancy principle and Expertise effect (Haythornth & Andrews, 2011), which are related to the barriers like, lack of training, technical problems and skill shortage faced by teachers in online education. Conservation of resources (Hobfoll & Freedy, 2017) states that human maintain their existing resources and try to find new resources, since there is always scarcity of resources. This theory can explain how parents and teachers can collectively face challenges of financial and resource shortage in implementing the online education system.

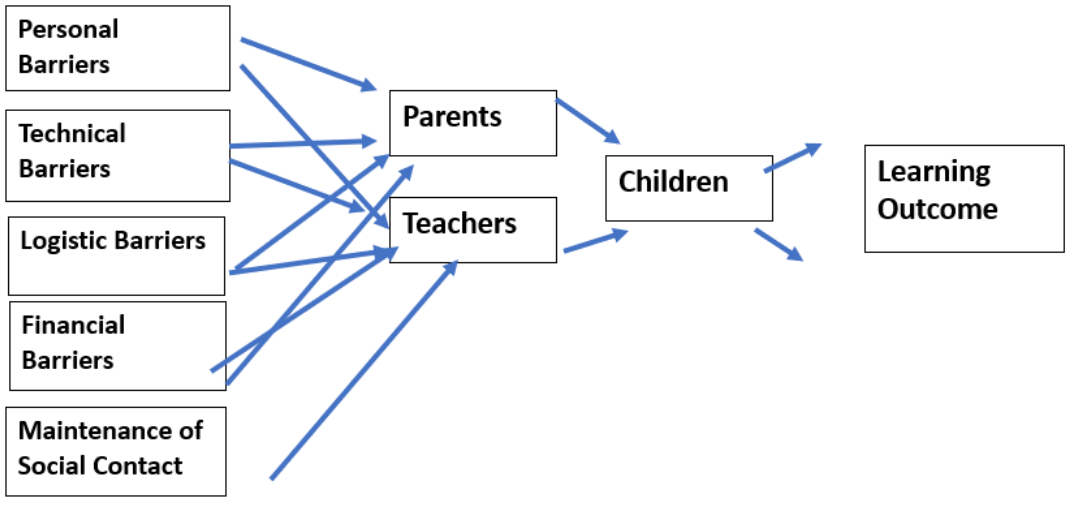
Based on the findings of previous studies and theories on the problems of the online education, the research framework has been offered in the data analysis section showing the clear position on each issue relating to problems faced by both parents and teachers being stakeholders of online education system during pandemic the COVID-19- in Pakistan.

Parents, of young children, have also been affected greatly due to closure of schools. Children are directed to stay and learn from home. These immediate transformations placed barriers on many parents, especially for those who work full time because they must now have to watch over their child(ren) while working their regular full-time job. This situation causes a great deal of pressure on parents as they have to help their children with their studies as well as their own job responsibilities along with their other routine tasks. Parents with low education background are unable to help their child with learning because they themselves are unable to understand the content. (Burgess& Sievertsen, 2020).

Even if parents have the knowledge and capacity to teach their child, due to pressure and workload, they are unable to devote required time to teaching, so low learning outcome observed as compared to the scenario when they attended school. (Burgess & Sievertsen, 2020). Therefore, children will be at different educational levels when they return to school i.e. once the pandemic will be concluded.

2.2 Conceptual Framework

Online education is a complex phenomenon. In Pakistan, as parents of primary school children, Children themselves and teachers faced different challenges and problems during COVID-19 regarding online education. These challenges and problem are called the barriers. Oxford Dictionary (2015), explained barrier as an obstacle or a fence that hinders access or achievement. Furthermore, Schoepp (2005, p.2), also defined barrier as condition that makes progress difficult or a condition that affect achievement of goals. In this study, Schoepp's (2005) definition of the barrier will be adapted.



Conceptual Framework

Online education challenges related to children comprise personnel and financial issues, motivation, assessment, inadequate skills and understanding of new content. From parents' perspective, barriers include resources, facilities, income, education, ICT skills. From Teachers perspective, barriers are related to online learning including maintaining social contacts with learners and various aspects such as experience, preparedness, resources, assessment evaluation and provision of feedback. There are so many barriers related to online learning. Ertmer (1999) defined two types of barriers, first order and second ordered. Barriers include access, hardware, and technical support is considered as first order barrier while barriers related to personnel preferences, belief and instructions were considered as second order barriers.

Pelgrum (2001) classified online education barriers as material and non-material barriers. Material barriers includes lack of technical resources while non-material barriers are related to teachers' competency and skills.

Balanskat, Blamire and Kefafa (2006), discussed three levels of barriers i.e. teacher level, school level and system level. Quadri et.al. (2017), examined the barriers regarding e-learning implementation, according to them, barriers are related to students, teachers, infrastructure, technology and management. According to him, the most significant barrier is lack of infrastructure, and limited time to develop e-Learning techniques that significantly hinders the e-learning implementation, while students' ICT skills were determined as comparatively less significant factor. Shalawati and Hadija (2017) explored barriers encountered by the teachers during online classes. Significant factor was preparedness for using technology and other important constraints i.e. lack of ICT skills, physical resources, and access to technology.

Johannes König (2020) has conducted a study by using survey tool and collected information from 165 early career teachers in Cologne, Germany. In early career

teachers, regarding online education due to school closure; required teacher education and competence. In Germany like other countries, schools have been closed in March 2020, survey was conducted in May and June 2020 to investigate that how teachers maintained the social contact with students and cope up with challenges. Descriptive as well as inferential technique was used in his study. Regression analyses showed that information and communication technologies (ICT) tools, teacher digital competence such as their technological pedagogical knowledge competence and teacher's training to learn digital competence, are contributory factors in adapting online teaching during COVID-19.

Megan Khufeld et.al (2020), investigated the impact of school closure on academic achievement. Due to COVID-19, education systems pushed to meet the needs of students and families. Projections were made on available data based on estimates from absenteeism literature and analyses of summer learning patterns of 5 million students. Projection revealed that to overcome the loss, 2 x full years will be required.

A. Assareh and Bidokht (2011), highlighted four types of barriers regarding online education. Student's perspective, which included financial issues, motivation, assessment of their progress, isolation from peers, inadequate skills and new experience. Teacher perspective, which included barriers like lack of adequate knowledge about e-teaching environment, difficulty for assessment of different domain progress etc. Curriculum related barriers, which included ambiguity, quality, resource, teaching process, evaluation and institutional / structural barriers. To overcome these barriers, cooperation among curriculum developers, teachers, parent's students, social authorities, technological specialist will be required.

CHAPTER 3

Research Design and Methodology

3.1 Research Methodology

3.1.1 Research Design

In this study, Quantitative research method is used. A quantitative design deals with fact and figure or numbers. The study is descriptive as well as Inferential to meet the objective. According to Gunderson and Aliaga (2002), quantitative research is description and analysis of information by gathering numerical data using statistical and mathematical tools. In this study challenges and barriers faced by parents of primary school children, primary school children and Teachers of both public and private schools in Rawalpindi and Islamabad have been investigated.

3.1.2 Units of Data Collection and Methodology

It was decided to collect the data from 100 x primary school teachers and 200 x parents of the children and children themselves enrolled in public or private schools of Rawalpindi Islamabad for study. Two questionnaires have been designed, one for teacher's perspective and one for children and their parent's perspective. 'Random Sampling Technique' has been used for selecting samples from Government schools; Random Sampling is a probability sampling technique, where each element in the population has a known nonzero chance of being selected. From the list of Government schools located in Rawalpindi and Islamabad. At second stage, by contacting administration teachers has been approached. At stage three, teachers have been requested to share the questionnaire randomly with parents and children.

A private school is an institute funded and managed by a non-governmental entity or entities. Private schools are not financed or managed by state or governments and are not remunerated through public tax and they are not subject to follow the government regulations. Purposive sampling technique has been used for selection of Private schools. Purposive sampling, also known as judgmental or subjective sampling, it is type of non-probability sampling in which researchers select sampling unit on their own judgment by considering the objective of study.

Private Schools have been categorized into three categories, Low Fee Private Schools (LFPS), Medium Fee Private Schools (MFPS) and High Fee Private Schools (HFPS). At First Stage of Sampling, Purposive Sampling technique has been used then at Second Stage, teachers were approached randomly and at Stage three, students/parents were contacted. Sample from each type has been decided by using data of HIES 2018-19. Teachers were requested to share questionnaire randomly with the parents and children whose children were enrolled in Grade-5.
Data from 95 teachers and 185 parents has been collected due to school closure by approaching school administration again and again.

SCHOOL TYPE	FEE RANGE	Covered
LFPS	**0-1500 (4% of Household Consumption Expenditure, HIES 2018-19)**	14
MFPS	**1500-8000**	35
HFPS	**8000 +**	12
TOTAL		61

Table:3.1 Type of School with Coverage

Data on different variables including demographic indictors, level of income, education level, household size etc. has been collected. Further information about facilities including electricity, internet, computer, laptop, tablet, smart phone etc. along with challenges faced by parents, children and teacher has been covered in the study.

During COVID-19 pandemic, studies have been conducted all over the world to determine the effect of COVID-19 on education as school college and Universities remained completely closed for almost 6 x months' periods. In Pakistan, schools were opened for a short time and then remained closed for whole academic session.

In this study, a model separately for Parents, children and teachers has been analyzed by considering the perspective of identified stakeholders of online education. Two questionnaires have been designed, one for teachers' perspective and other for the parents & children perspective; as stakeholders of online education of pre-primary and primary school children. Information regarding children perspective will be captured from the same questionnaire designed for parents.

3.2 Hypothesis

The hypothesis that we will test for the study is as under.

- Moreover, the hypothesis that we will test in this paper is the challenges faced by primary school teachers while conducting online classes and social contact, with children.
- Satisfaction of parents with child learning during pandemic with online classes.
- Child learning outcome with all the challenges including personal, technical and logistic.

3.3 Teachers Perspective

Descriptive as well as inferential technique will be used to analyze the teacher's perspective, logit model has been used by considering maintenance of social contact with learners as dependent variable '1' yes '0' if not maintained; independent variables included teacher's professional knowledge, confidence regarding

instructional strategies, use of technology and gadgets for delivering lectures. Teachers' education and experience will be the independent variables of the study. Maintenance of social contact will be used as Dependent variable

3.3.1 Dependent Variable:

In current study for teacher's perspective as stakeholder about online education during Covid-19, Maintenance of social contact with children and parents during pandemic was considered as dependent variable to highlight the barriers and challenges face by teacher to maintain contact to help and facilitate children and parents to overcome the learning loss.

Maintenance of Social contact: Maintenance of social with primary children is assumed as main factor of child learning.

Demographic Characteristics: Questions regarding age, marital status, no of kids will be asked from every teacher selected in household.

Teachers Qualification: Teacher qualification will be included as predictor of teacher competence in survey.

Teachers Training: Questions regarding teacher training for providing online education is also being included in survey as independent variable as it is assumed that training is necessary regarding use to devices and software for better communication in distant learning.

Teachers Experience: Questions regarding years of teaching will also be asked as it is assumed that, early career teacher have more potential to adopt new technology.

Digital Literacy: Questions regarding ICT skills of teachers will also be included in survey.

Medium of Instruction: Different medium of instruction will be opted by different schools to continue the child learning during Covid-19 period variable is included to measure influence of medium chosen by school on maintain social contact and teacher competence.

Type of School: Type of school Low Fee Private School (LFPS), Medium Fee Private School (MFPS) and High Fee Private School has also been used as independent variable.

3.4 Parent Perspective

Logit regression model for analyzing the parent's **Satisfaction form the learning** of primary schools' children enrolled in Grage-5 has been analyzed by considering it dependent variable. Variable will take value '1' if parents is satisfied with child learning and '0' if not satisfied. Demographic, socio-economic indicators and technical and logistic barriers will be the independent variables of the study.

Parents Education: Educated parents are considered more awarded and concerned for children Learning.

Parents ICT Skills: COVID-19 changed the education medium from physical schooling to online schooling and parents' ICT Skills is considered as major factor on which child learning depended during pandemic period.

Internet Connection: Access to internet and quality of internet are mandatory for online education.

Devices: Variable is included to observe the privacy of children as if only one device is available for 3 children then it is not possible to take class properly as he/she has to share device with siblings.

Medium of Instruction used by School/Teacher: Variable is included to observe the learning outcome and satisfaction of parent, as some schools opt online education or some schools sent assignments or videos.

Teachers Feedback: Teacher feedback regarding performance of child palys an important role for Parents satisfaction.

Assessment: Assessment depicts the learning of child, teachers adopted different methods to assess child learning.

Internet Qulaity: As only 35 percent household have access to internet (HIES 2018-19) and it is expected that household made arrangement to continue child education that in turn put financial burden of household.

3.5 Student Perspective

Students are the end users of online education, their learning as outcome will be considered as dependent variable and interaction with teacher, understanding of the content (new content), development of new skills regarding online education, along with availability of device and technology will be the independent variable.

Child Grade: The grade secured by children of Grade -5 during pandemic is considered as dependent variable

Education of Parent: During School closure children required support and guidance from parents and education/Qualification of both mother and father is included in questionnaire.

Privacy: Question regarding no of rooms in house is included as it is related to child privacy while taking online class.

Working parents: Question regarding employment status is included as if both parents are working then management of school from home can be a challenge for primary school child.

Quality of Internet: Question regarding type of internet connection is included in questionnaire and question regarding disconnection while taking class is also part of survey.

Device for attending Class: Question regarding device that is not shared with other siblings is included in survey.

Type of School: Question regarding type of school in which child is enrolled is included in survey as Established Private schools with proper LM system conducted online classes but Government school emphasize on assignments during the period.

New Content teaching: During Covid-19 period some schools introduced new content to the children, but some keep on revising old content, new content is also assumed as significant predictor of child learning.

Assessment: Assessment determines the learning of child, therefore included in the study.

CHAPTER 4

Results and Discussion of Results

4.1 Teachers Perspective

The COVID-19 pandemic situation has created unavoidable challenges for Primary school teachers to explore the use of technology for online teaching. Till March 2020, the teaching methodology was conventional at school according to decided curriculum and timetables in classrooms and teachers covered their program of study' through formally by delivering lecture. Students learnt through the physical lectures and assessed through exams and use was IT was limited to their computer subject class. The school closure due to pandemic put all the stakeholders in an entirely new and unpredictable situation. Teaching and learning can only be possible with the use of technology. Teachers changed the mode of teaching to online teaching, which required various digital and technical resources, tools and new approaches to resolve the issue. Despite of achieving instructional targets, teachers also have to maintain contact with their students and caregivers by considering the factor of social integration.

4.1.1 Transition from Conventional to Non-Conventional Educational Systems

Rapid transformation of education system to online teaching due to COVID-19 was astonishing and digitalization in schools has attained prominence suddenly. Although technical infrastructure is required to implement ICT in Education instructions but in Pakistan due to social restrictions, use of digital technology for education purpose at school level has not been acknowledged before pandemic. But due to this rapid transformation, teachers and students must also be encouraged and supported for using digital tools.

As demand of the ICT integration has been increased in educational systems due to pandemic, therefore, teacher should increase their digital knowledge to meet the challenges associated with the ICT for teaching and learning. To counter the situation

created by pandemic, innovations in knowledge, skills and confidence was required to get success in online teaching.

Teachers' pre-service programmes should design accordingly by introducing ICT curriculum integration. European Digital Competence Framework has been designed for educator's competence by considering the ICT challenges (DigComEdu, Caena and Redecker 2019). In Pakistan, such framework should be adopted for school teachers as well as for university teachers for integrating ICT into the curriculum.

In this study, we investigate teachers' challenges faced by Primary school teachers due to rapid transition to online teaching during COVID-19. Study is mainly focused on:

- How primary school teachers maintained social contact with parents and children to meet the challenges related to provision of education (delivering lecture, teaching of new content, giving assignments, providing feedback, evaluation) during distant learning phase?

Data has been collected in June 2021 from Government and Private schools of Rawalpindi and Islamabad (Grade-5). Response rate was 95 percent, information from 95 primary school teachers of Rawalpindi and Islamabad has been collected. Out of 95 respondents, 13 were male teaches and 82 were female teachers, whereas 54 were married and 41 were unmarried, with two children on average, range from 0 to 4. Average age of the teachers was 33 years ranges from 22 to 67 years.

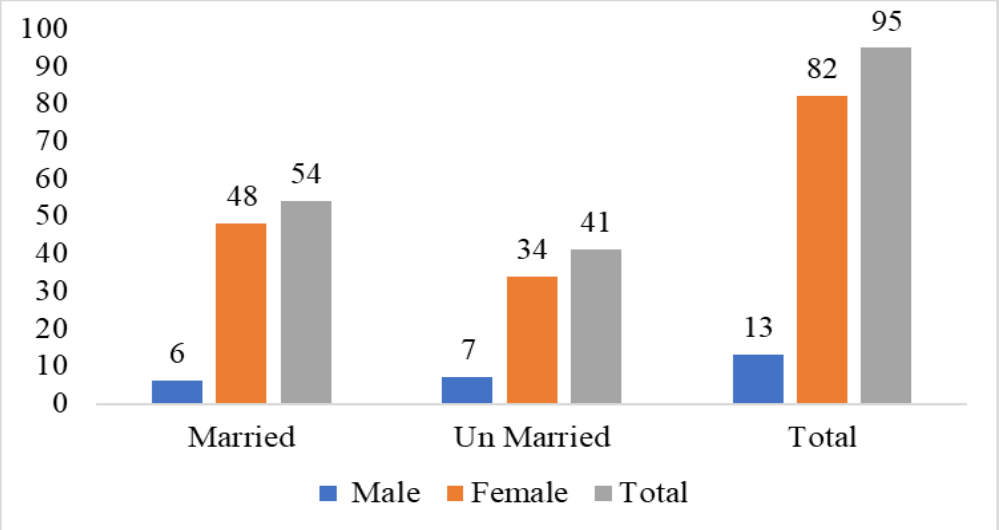


Figure 4.1 Teacher by Gender and Marital Status

4.1.2 Teaching Challenges During COVID-19 Online Environments

The main challenges faced by teachers while providing online education during the COVID-19 pandemic was provision of online instructions. Before pandemic induced school closures, ample techniques were available to support teaching mechanism but not used widely for teaching in Pakistan Online teaching and learning interaction were the only options to facilitate children during school closures. Teachers tried to put all their efforts to enable students to learn important part of the curriculum, further communication of (new) learning content to students of primary school age was another challenge. Teachers adopted different techniques for provision of task differentiation to help children at home. Teachers' feedback to guide the students and evaluation to reduce the gap between learning outcome and the material absorbed was also a biggest challenge for teachers. As assessments are integral part of education system, therefore schools adapted different techniques to assess children in the absence of physical interaction.

In this study, teachers of Primary school (Grade-5) were asked about their qualification, experience, ICT skills, training to meet the challenge of provision of quality education to primary school children during COVID-19. One of the major challenges that teachers faced, was the maintenance of social contact with children

and their parents. Teachers' competence has been analyzed on the basis of facts associated with concepts and principles.

4.1.3 Digital Competency of Teachers and Teacher's Training

Teacher's qualification along with experience and digital skills has potential to address the challenges faced by children during COVID-19 regarding their education. Questionnaire regarding teacher's qualification, experience and digital skills was part of survey along with other genial information about demographic characteristics.

It is observed that 50 percent of Government school teachers and 46 percent of private school teachers have at least qualification equivalent to Masters. |It is further observed that Government teachers are more qualified with degree of MPhil and MS as compared to private school teachers with 32 percent and 15 percent respectively as shown in figure below.

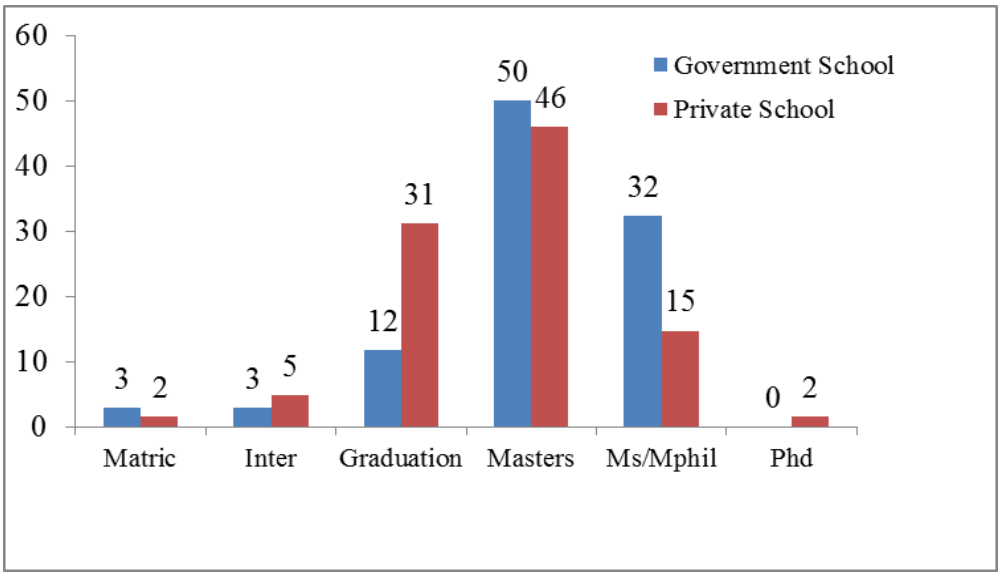


Figure 4.2 Teachers Qualification by Type of School

From the figure 3.3 it is observed that experience of teacher's ranges from less than one year to 26 years, 20 percent teachers reported experience of 4 years. Whereas 52

percent teachers reported that their experience in this field ranges from 0- 4 years. Government School teachers found more experienced than private school teachers.

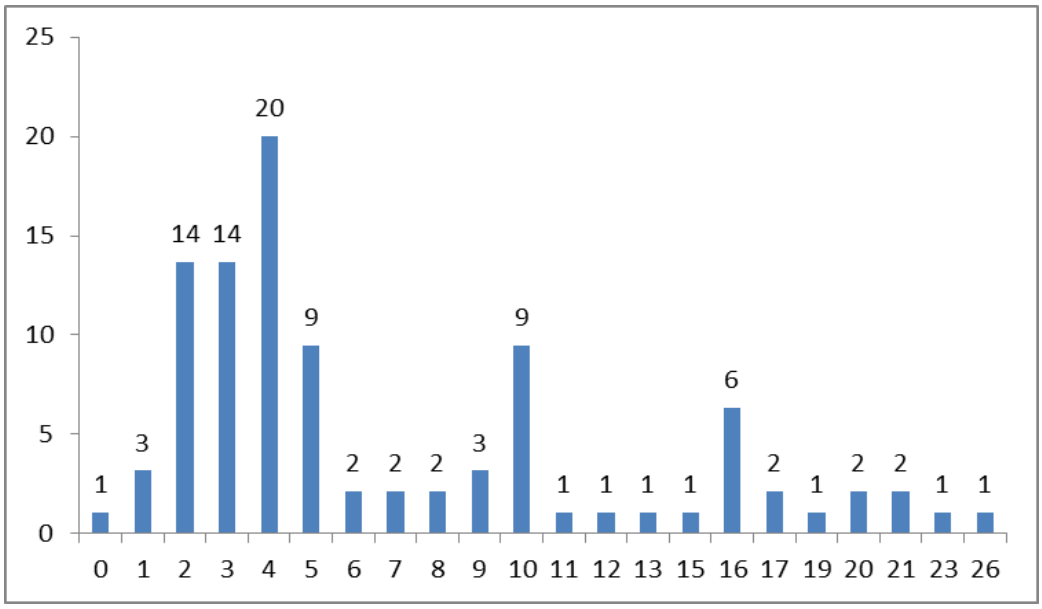


Figure 4.3 Teachers Experience

Teaching profession gives a teacher; opportunity to build a healthy education system for the country by entrusted children education – the future of the country. They have ability to build the minds and helping children to become well-behaved individuals. Education courses of teachers not only introduce teachers with good teaching skills but also enable them to work in the administrative aspect of an education system. The curriculum of teacher training can be developed in a way to enable them to play their part for making a healthy education structure. Therefore teachers, usually complete their graduation degree followed by a B.Ed. which is a two-year course and, the course is compulsory for appointment in government sector for teachers. These two years help in building their portfolio as a teacher. Educational courses help teacher to learn the art of teaching at different school levels such as the secondary and senior secondary, and a host of other benefits. Professional teaching degree may help teachers during COVID-19 period to guide student in proper way to cover their education loss by maintaining social contact with students, while introducing new content and by providing feedback to parents and students after assessing students.

It is observed that Government school teachers are more trained professionally as compared to private school teachers, as 36 percent Private school teachers have no professional degree whereas 90 percent government teachers reported that they have B.Ed. or M.Ed. degree and 5 percent reported other Courses including Computer etc. Only 44 percent Private school teachers reported that they have Professional degree and 18 percent reported that they have done different courses.

As in previous section, it is observed that Parents whose children are enrolled in Government schools are more satisfied than the parents of private school children. Teachers' professional skills can be the reason behind as they are professionally train and experienced and they know how to manage and satisfy both parents and children.

Table 4.1 Teachers Professional Training by type of School

	Government School	Private School	Total
No	3	22	25
CT	0	1	1
B.Ed.	9	20	29
M.Ed.	20	7	27
Other Courses	2	11	13

In response to the question related to the medium of instructions adopted by school during school closure due to COVID-19, it is observed that 57 percent of Schools on average conducted online classes; private schools were more prone to that with 77 percent as compared to Government schools with 21 percent. WhatsApp as a medium to convey instruction to the children was adopted by 45 percent schools and 34 percent school prefer to give homework and Assignments to children instead of online classes.

Table 4.2 Medium of Instruction by Type of School

	Government School	Private School	Total
Online	21	77	57
WhatsApp	88	21	45
Assignments	41	30	34

77 Percent teachers reported that they were prepared for this transition to un-conventional E-education and 44 percent reported that their schools conducted trainings before shifting to E-education to make teachers familiars with tools and skills.

Zoom is the software that is mainly used by Government and Private schools who chose online medium of Instructions and teachers during pandemic to conduct online classes as shown in table below.

Table 4.3 Software Used by Type of School

	Government School	Private School	Total
Zoom	86	91	91
Skype	14	-	2
MS Teams	-	9	7

Mostly teachers with 52 percent reported that they used smart phones to conduct online classes or giving directions to the children followed by laptop with 37 percent as shown is figure below.

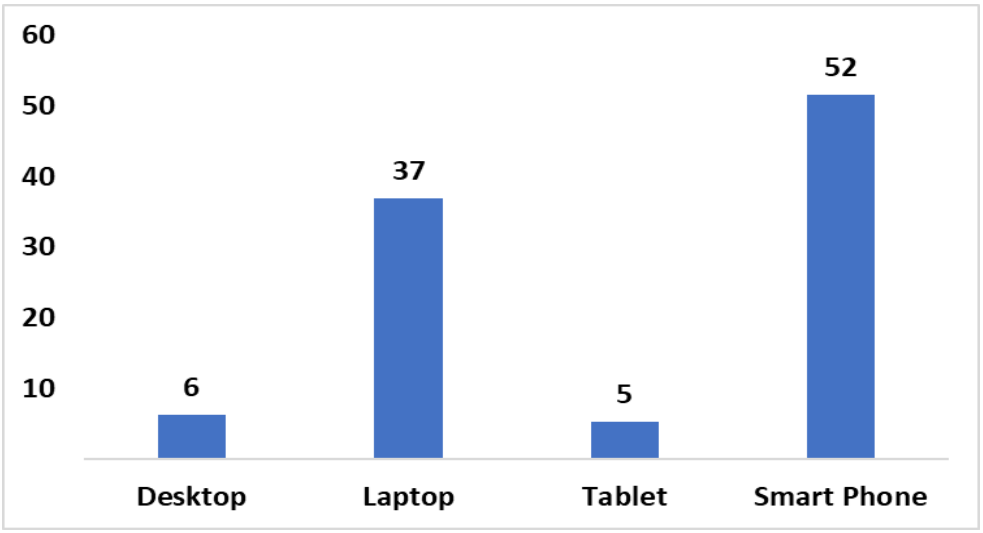


Figure 4.4 Devices Used by Teachers During Pandemic for Distant Learning

4.1.4. Social of Contact Maintenance with Parents and Students during Pandemic.

In typical physical classroom settings, considerable interactions build healthy relationships among teachers and students which plays a very important role in their academic outcomes. Through interaction with students, teachers can motivate and engage children in more effective manner. Furthermore, it allows teachers to know that whether children are understanding content or not which is difficult for teachers to determine from a distance.

Teachers across the country have been directed for rapid transition from classroom instruction to remote learning by using hybrid model due to COVID-19. This shift has not entirely eradicated their opportunities to maintain social contact with children but reduced in-person interactions with their students. This transition to distant learning challenged teacher student relationships nationwide. It is expected that gaps in teacher–student interactions may increase the learning loss that has already been attributed to the widespread reductions in instructional time that have occurred as a result of the pandemic.

Teacher communication with parents also shifted in response to the pandemic, and

this was a particular area of concern for teachers due to variation in household environments and their capacity to support their children in the period of distance learning. Households with disadvantaged background, have limited access to technology, it was problematic for teachers to contact children form disadvantaged background, if teachers also have technological limitations than situation become more vulnerable.

Question regarding maintenance of social contact has been included in questionnaire to explore its impact on child learning during pandemic and the frequency with which teachers were expected to "meet with their students," "their availability at scheduled times to respond to student questions," and "to communicate with families about expectations for students or distance learning resources."

79 Percent Government school teachers and 74 percent Private school teachers reported that they always guided or helped children and their Parents when they faced issues regarding education during distant learning. Three percent Government School teachers reported that they didn't guide children while distance learning whereas 5 percent Private school teachers refused and replied as "don't know" against this question.

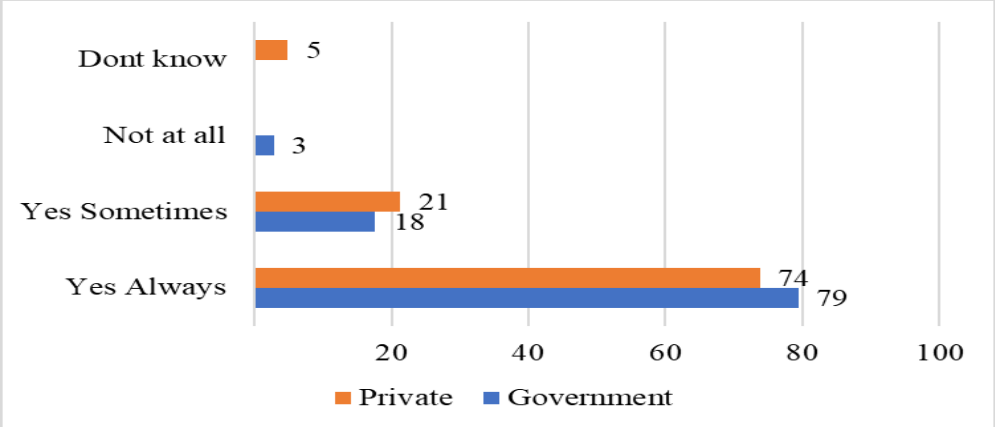


Figure 4.5 Maintenance of Social Contact

In response to the question regarding introduction of new content, 24 percent Government school teachers reported that they introduced new content many times as compared to 16 percent Private school teachers. Most of the teachers of both Public and Private schools reported that introduction of new content was subject to the children learning and understanding as shown in figure below.

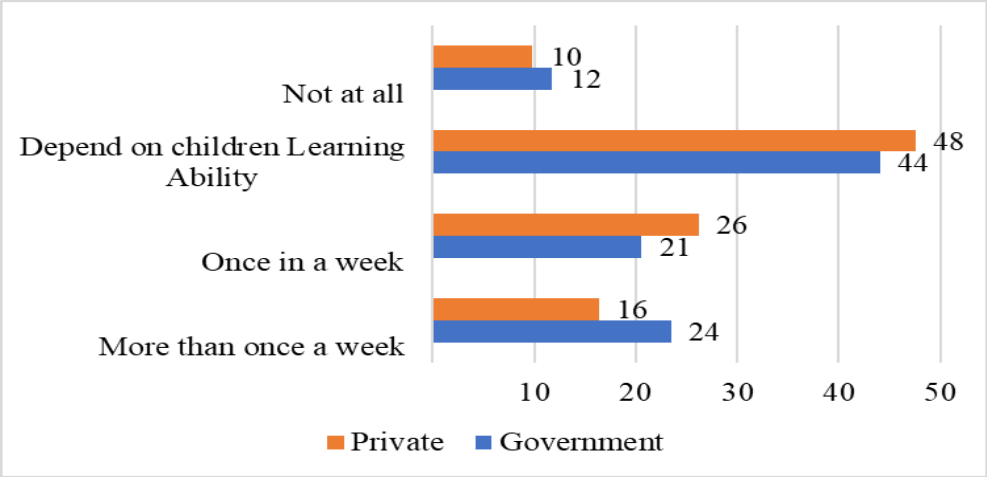


Figure 4.6 Introduction of New Content

Teacher's feedback plays a very important role in child learning and grooming, feedback to parents also help parents to focus on weak areas of child and can have significant impact on parents' satisfaction. Thirty five percent government teachers while 21 percent private teachers reported that they provide feedback to more than once a week to parents and children. Whereas majority of private school teachers reported that provision of feedback to parents and children was depended on requirement and student performance.

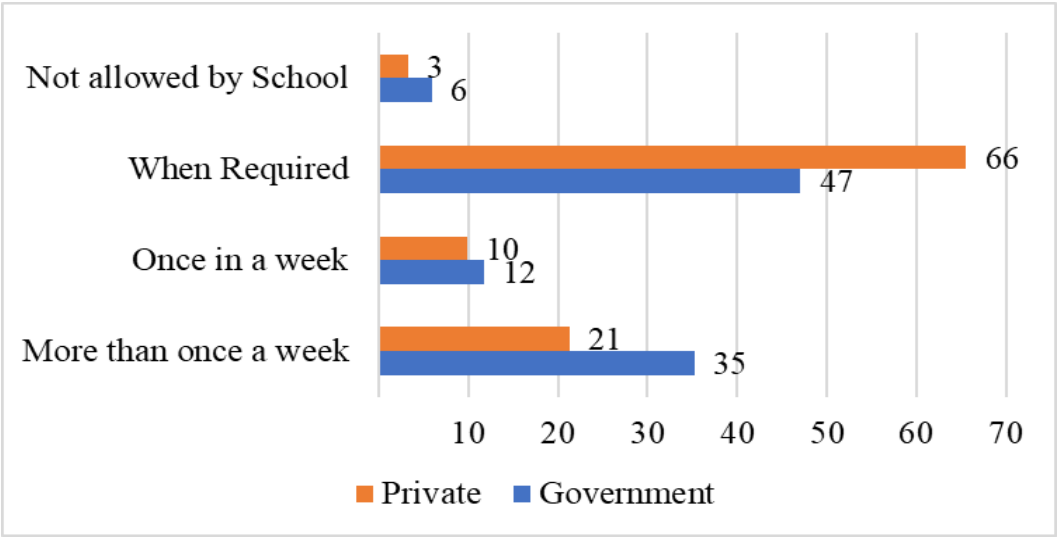


Figure 4.7 Provision of Feedback

Evaluation is mechanism of assembling statistics about a child, this collected information enables teachers to plan educational activities by considering child level. Evaluation through assessments is a crucial part of a high-quality, early childhood program. Teachers use assessment results to get information about child's abilities to assign different tasks. Observing and recording a child's work and performance throughout the academic year enables a teacher to prepare a progress report of the child's learning and development. Teachers by using this information can plan suitable curriculum and effective customized instructions by considering potential of children.

This report of assessments is also shared with parents so they can track their child's performance and abilities at school, which enables them to understand their child's strengths, weakness and challenges, and they can adopt mechanism accordingly to help their child according to their need. Assessment provides both teachers and parents with critical information about a child's development and growth. Evaluation also helps to identify the strengths and weaknesses within a designed curriculum, it also provides a common ground between teachers and parents for collaborating on a strategy to support their child.

In response to the question regarding assessment methodology adopted by school, on average 65 percent teachers reported that they assessed children on the basis of assignments submitted through WhatsApp, whereas 41 percent Private school teachers reported that they preferred online Quizes to assess child's learning. Government schools not at all conducted assessment in schools while 3 percent private school teachers reported that they conducted exams in school to assess children ability/learning. Figure below is depicting the picture of assessment methodology adopted by Government and Primary School teachers during COVID-19 to assess children.

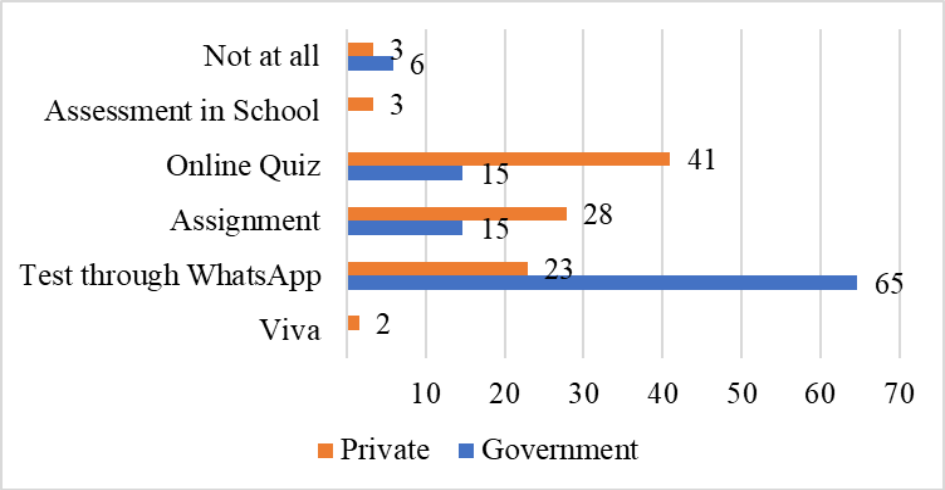


Figure 4.8 Assessment Methodology Adopted by School

In response to the question regarding satisfaction from children learning during COVID-19 period, 56 percent Government school teachers reported that they are satisfied with their children learning whereas 44 replied that they are not satisfied with their children learning. 52 Percent private school teachers reported that they are not satisfied with the learning of children.

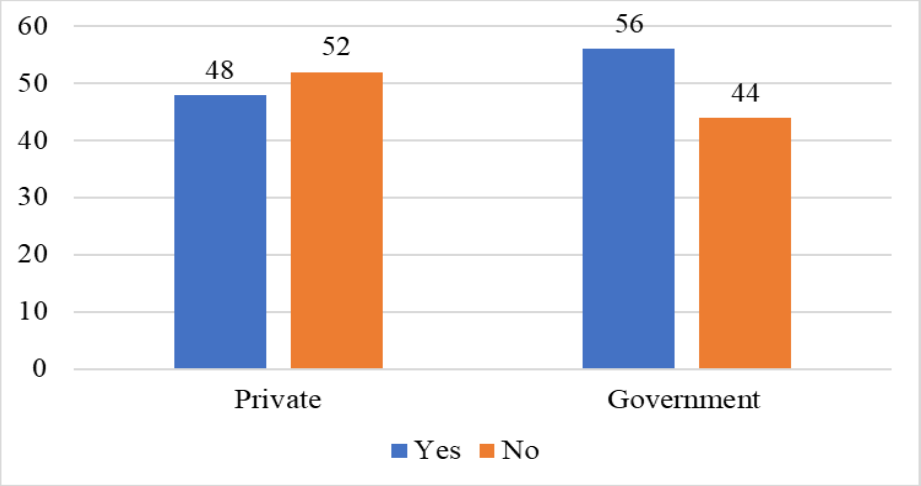


Figure 4.9 Satisfaction from Child Learning

4.1.5 Regression Analysis

To analyze the factors influencing teachers' management of core challenges during COVID-19 school closures, logit model has been used by considering maintenance of social contact with learners as dependent variable '1' yes '0' if not maintained; independent variables included teacher's professional knowledge, confidence regarding instructional strategies, use of technology and gadgets for delivering lectures. Teachers' education and experience will be the independent variables of the study.

Table 4.4 Dependent and Independent Variables used in Logit Model

Dependent Variable	Independent Variables
Maintenance of Social contact	• Demographic Characteristics • Teachers Qualification • Teachers Training • Teacher Experience • Digital Literacy • Type of School

Table 4.5 Output of Logit Regression, Teacher Perspective

Social Contact	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Experience	-.016	.131	-0.12	.904	-.272	.241	
Male	-1.368	1.331	-1.03	.304	-3.978	1.241	
Married	-.861	1.598	-0.54	.59	-3.993	2.27	
completed_education	.7	.496	1.41	.158	-.271	1.671	
Training	2.034	1.35	1.51	.132	-.613	4.68	
computer_litercy	-.283	1.223	-0.23	.817	-2.681	2.115	
internet_quality	3.61	1.314	2.75	.006	1.036	6.185	***
Government	-.465	2.586	-0.18	.857	-5.533	4.603	
Mfps	-1.825	2.713	-0.67	.501	-7.142	3.492	
Hfps	.013	2.775	0.00	.996	-5.426	5.453	
medium_online	1.394	2.13	0.65	.513	-2.78	5.569	
medium_whatsapp	.034	1.646	0.02	.983	-3.192	3.26	
medium assignments	-.145	1.497	-0.10	.923	-3.079	2.788	
satifaction_childperform	-1.854	1.202	-1.54	.123	-4.211	.502	
reduced_salary	-1.841	1.196	-1.54	.124	-4.185	.503	
education_degree	.505	.4	1.26	.207	-.279	1.289	
Constant	-2.139	3.496	-0.61	.541	-8.991	4.713	

Mean dependent var	0.884	SD dependent var	0.322
Pseudo r-squared	0.491	Number of obs	95
Chi-square	33.469	Prob > chi2	0.006
Akaike crit. (AIC)	68.637	Bayesian crit. (BIC)	112.053

**** p<.01, ** p<.05, * p<.1(Detailed results are Annexed as Annexure-1)*

Teachers faced many challenges for maintaining social contact with children and introducing new content to children during pandemic, when schools were closed. Children's interaction with their teachers is the salient feature of the classroom environment and figure prominently in theories concerning children's development and learning. Studies reveal that positive interactions of teachers with children influence children's concurrent and long-term social, emotional, and academic development. During COVID-19, due to distant learning the social interaction of teacher along with children remain affected. To analyze the factors that influence the maintenance of social contact between teacher and children logit model has been used by considering demographic characteristic including age, gender, marital status further Teacher Qualification, their experience, training before conducting starting distant learning, digital literacy and medium of instruction along with type School.

Findings of analysis given in the Table above reveals that dependent variable measuring the extent to which teachers maintain social contact with students can be explained. Quality of internet found most significant factor for maintaining social contact with children during distant learning. Maintenance of social contact is the key in providing tasks to students in a differentiated way and in providing feedback. Different functions and tools of many video communication platforms have been used by teachers to facilitate learning. WhatsApp groups have been made by teachers for interaction and for sharing material and passing instructions. Among gender, marital status, experience, training, completed education, type of school, medium of instruction and reduced salary, Quality of Internet found most significant factors for maintaining the social contact with children during COVID-19.

Social contact between a student and his/her teacher remains incredibly important during COVID-19. Communications should be frequent, clear, relevant, and aligned to the different needs of learning. Teachers used live or pre-recorded videos to have contact with children. This was somehow helpful for children to feel connected, cared and motivated for learning. For maintaining social contact during COVID-19, importance of quality of internet cannot be denied and this study revealed the same.

It is observed that maintenance of social contact with students decline with the increase in experience as negative sign of the coefficient of indicator reveals so. This may indicate that with the increase in experience, teachers have become less familiar with new teaching techniques and were unable to maintain social contact with students. Furthermore, it is observed that maintenance of social contact with children declines if teacher was married which indicates that due to being married and increase of responsibilities and management of own kids, negatively affected the teacher's ability to maintain contact with children. It is also observed that reduction in salaries of teachers due to pandemic also had negatively affected the social contact between child and teacher.

Moreover, it is observed that teachers form High fee private schools maintained social contact with children but with the change in type of school as in case of Government school and Medium fee private schools, sign of coefficient indicated decline in maintenance of social contact.

It is observed that qualification of teacher, his/her degree in education like CT, B.Ed., etc. and training of teachers before switching to the distant learning increase the ability of teacher to maintain social contact with children.

Internet Quality and teachers' competence and type of school found major contributors that affected teachers' competence to maintain social contact with children which in turn affected the quality of education and leads to the learning loss of children.

4.2 Parents Perspective

During the COVID-19 pandemic, Primary school remains closed almost for whole academic year and education was shifted to online education. Primary schools were open twice in whole academic year for less than one month with 50 percent attendance and reduced timing before second and third wave. Interprovincial Education Minster Conference held on 4th August 2021 and it was decided that school were re-opened after summer break with 50 percent strength. In the meeting held on 25th August 2021, it was decided to open the schools with half strength in September 2021.

Organized school learning is physical learning, in which students attend school and learn under the supervision of a teacher, which transformed into distant learning during pandemic. The concept of "home-schooling", became only possible solution for educationists and accidently parents became homeschooler. Previously homeschooling was understood as from education provided at home. Parents played a large role in this regard, by bearing this responsibility without any prior training.

Previously parental contribution has been considered important but not necessary, but during pandemic parents were the only ones who have to help children to learn digital skills; which is the first requirement to be benefited from un-conventional learning process, they also guided them and helped them to understand the content and managed the education requirements of children in a balanced way along with routine responsibilities. Parents want their children to learn well, and want to make them responsible, successful and flourishing in life and these parental desires depends on quality of education system. Parents perspective regarding their satisfaction from child's online learning has also been analyzed in this study.

The unexpected challenged situation of education system created by the pandemic bring several challenges for parents, which can be defined as barriers in accomplishing the learning objectives for their children. Parents of the students were the only supporters for their children during pandemic to continue the education, otherwise the educational process would stop. Parents support empower children to accomplish some of their learning objectives. Students' achievements in learning depend mainly on their parents' support which is linked with parents' own familiarity with different techniques, tools and digital knowledge. Learning opportunities also depended on the living standards of families, and access to connectivity and digital devices to continue education from home. Previous studies have shown that households belong to higher income group and well-educated parents cope with crisis well and were able to facilitate their children during pandemic. But all the children were not in the same position to be benefited from distant learning process, therefore it is important to recognize the parents' perspective for providing them support being the caregivers during homeschooling period.

Parents experienced different challenges during homeschooling. Aspects of wellbeing was also important and couldn't be ignored; where parents had to struggle for providing their children with gadgets, they also had to enable their children for the use of technology, and at the same time, parents had to struggle to perform their duties well to continue their routine life.

The data has been collected from public Schools and Low fee Private schools (LFPS), Medium Fee (MFPS)and High Fee Private schools (HFPS) of Rawalpindi and Islamabad to investigate the challenges faced by Parents of Primary School children during online education. Online survey was designed by using google forms mainly by considering school closure. Most of the respondents were mothers with 71 percent, whereas percentage for father as respondent is 29 percent. Children's care at home is still perceived as mother's responsibility, furthermore, provision of support to children for studies goes more directly with mothers as compared to fathers. Survey shared was responded by mothers mainly, which strengthen this assumption that mothers are more involved in the provision of learning support to children as compared to fathers.

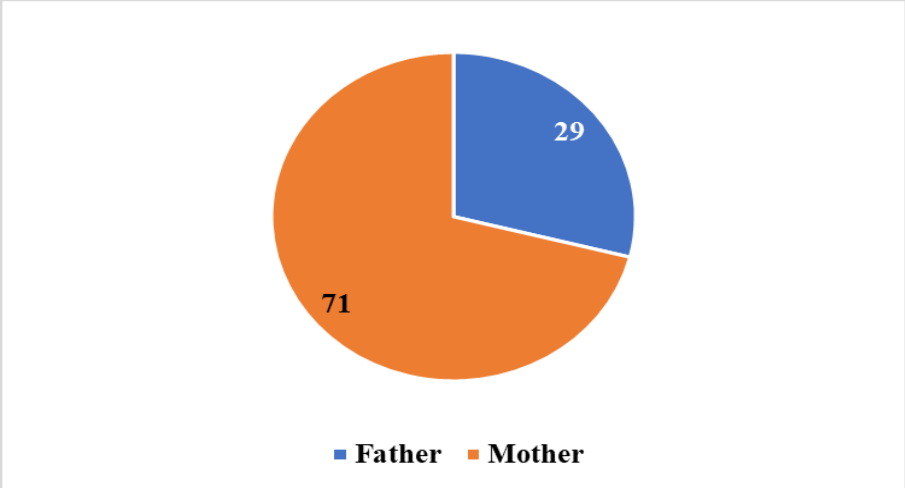


Figure 4.10 Respondent of Survey

Perspective of parents being the most crucial stakeholders of early childhood learning remains largely under-researched. During COVID-19, there is no other option to facilitate children except the use of digital technology. In country like Pakistan where the infrastructure for provision of online education is not yet mature enough, this research will fill the gap by investigating the barriers and challenges faced by parents and their satisfaction for their children learning. This study helps us to understand how Pakistani parents considered their primary school children's online learning during the COVID-19 lockdown.

4.2.1 Parents Education

Educated parents are considered more aware and concerned for their children's learning, as during pandemic and school closure, where learning was distant and teachers have no physical contact with children. Therefore, it is expected that the children whose parents are less educated or illiterate are the most suffered and vulnerable to the situation.

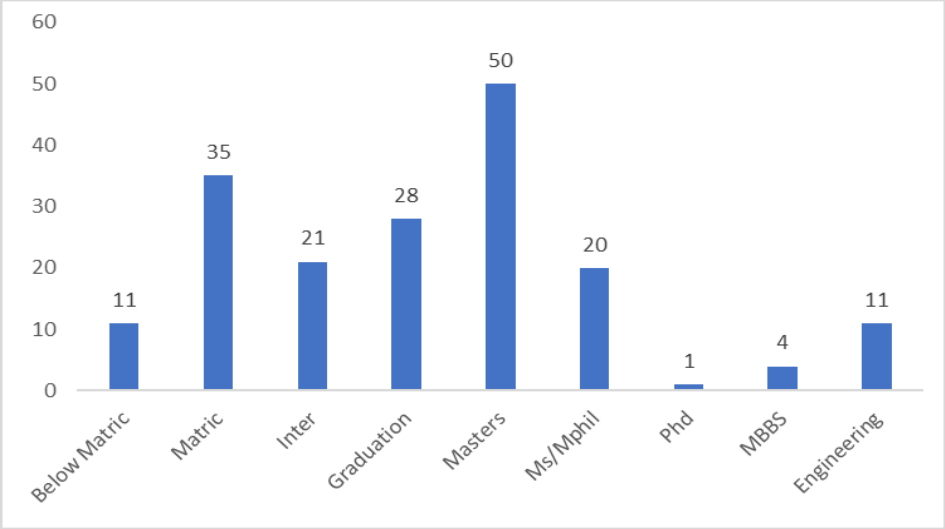


Figure 4.11 Qualification of Parents

Table 4.6 Qualification of Parents by Type of School

	Government School	Private School	Total
Below Matric	11	0	11
Matric	26	9	35
Inter	9	12	21
Graduation	11	17	28
Masters	10	40	50
MS/M.Phil.	5	15	20
PhD	0	1	1
MBBS	2	2	4
Engineering	2	9	11
Law	0	2	2
Total	76	107	183

In sample of 183, eleven parents reported qualification below matric and all of them are those whose children are enrolled in Government schools. This is the group of the children who remain un-attended due to school closure and un-educated parents. As government schools didn't offer online classes due to lack of proper infrastructure and school only shared lectures through WhatsApp, these students have to submit assignments in stipulated time period.

Parents with less education are unable to help children sufficiently in remote learning because they do not fully understand the principles of learning, do not have specific knowledge on particular subjects and need more attentions from teacher through cooperation between schools and children's parents.

4.2.2 Parents ICT Skills

COVID-19 changed the education medium from physical schooling to online schooling and parents' ICT skills is considered as major factor on which child learning was depended during pandemic period. Question regarding ICT skills was also the part of questionnaire and on average 32 percent, parents reported that they didn't know anything about downloading, use of Software, MS Office, Email, Browsing and online Shopping. Whereas, 57 percent parents whose children were attending government schools and 14 percent parents whose children were in private schools, reported that they have no ICT skills at all. Twenty eight percent parents reported that they can download material, 31 percent reported that they have ability to use Word, Excel, power point etc. Twenty five percent reported that they can use software; twenty eight percent reported they can send email. Gap in ICT skills of parents of Government and Private schools is evident from the table below.

Table 4.7 ICT Skills of Parents by Type of School

	Government	Private	Total
No Skill	57	14	32
Downloading	28	29	28
Software	14	33	25
MS Office	21	37	31
Email	17	36	28
Browsing	16	43	32
Shopping	3	15	10
All of Above	8	23	17

4.2.3 Internet Connection

Access to internet and quality of internet service are mandatory factors for distant learning. Seventy four percent parents reported that their household has Internet connection or they knew about internet or its use. 52 percent parents whose children are enrolled in Government school reported no access to good quality internet while parents whose children are enrolled in HFPS and MFPS reported access to internet. Overall, twenty seven percent parents reported no access to internet.

In our country, Pakistan Telecommunication Company Limited (PTCL) is the largest internet service provider and is most accessible. PTCL Char-Ji mobile broadband devices with speculative speed up to 36 Mbps and unlimited bandwidth can be good choices for users. While 36 percent reported access of cabled internet service, 16 percent reported access through wireless PTCL, telecard, Wateen etc and 46 percent reported that they used mobile data 3G, 4G to access the internet.

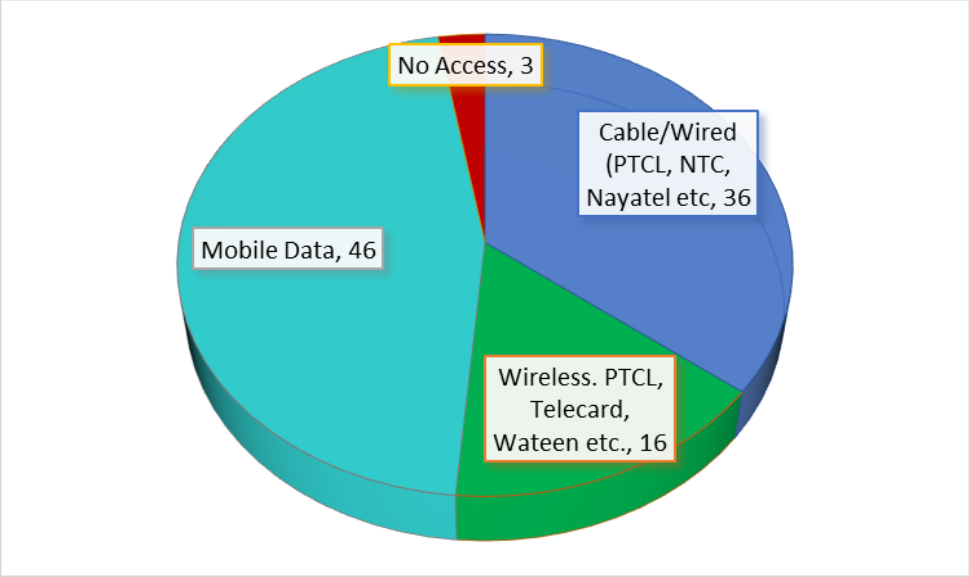


Figure 4.12 Internet Access by Type

According to the 'Inclusive Internet Index' which benchmarks countries on the internet's availability, affordability, relevance and the readiness of people to use it, Pakistan stood at 76th position out of total 100 countries. Relatively poor network quality and low levels of digital literacy are major impediments to internet inclusion, gender gap is another big issue", EIU. Pakistan showed poor performance in all the four dimensions used for the ranking including availability, affordability, relevance and readiness. In terms of availability, according to the category that examines the quality and breadth of available infrastructure required for access and levels of internet usage, Pakistan ranked 86th out of 100. Pakistan's score is relatively better regarding affordability (57th) that is described as the cost of access, as compared to income and the level of competition in the internet marketplace. Pakistan ranked 64th in terms of readiness measured on the basis of access to internet, including skills, cultural acceptance, and supporting policy.

Satisfaction rate from quality of internet of the parents of government school children is higher than the parents whose children are enrolled in private school as shown in figure below which shows that access meant more to them than quality.

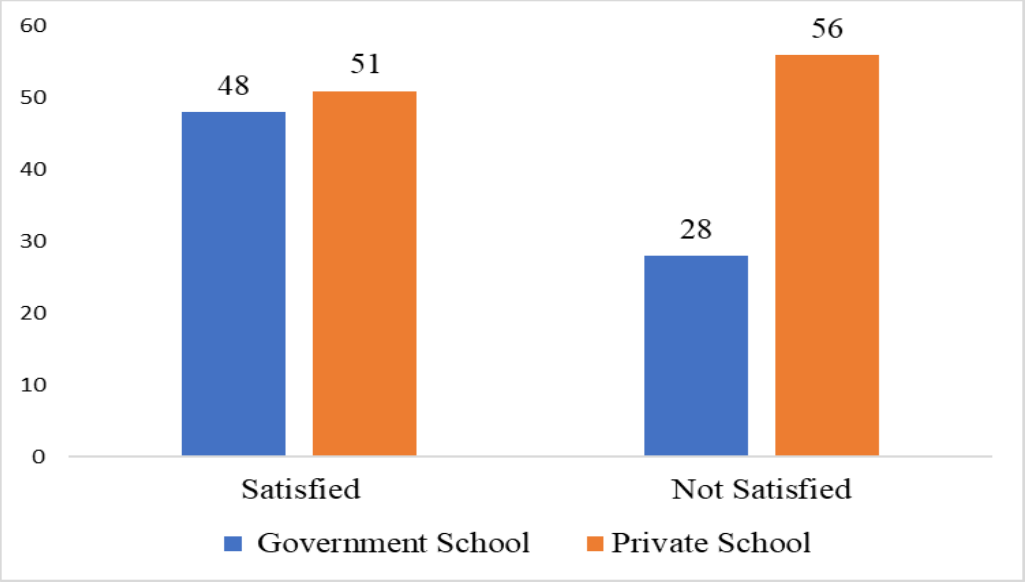


Figure 4.13 Satisfaction of Parents by Quality of Internet

4.2.4 Mode of Instructions

On average, 65 percent schools conducted online classes. Percentage is higher for Private schools with 79 percent in Rawalpindi, Islamabad as compared to Government schools with 45 percent. Whereas 33 percent schools give assignments to children and 42 percent used. WhatsApp used for communicating instructions to children. Seventeen percent schools used combination of online classes and assignments for learning purpose. Nineteen percent, schools used the medium of Assignments and WhatsApp during COVID-19 to educate children.

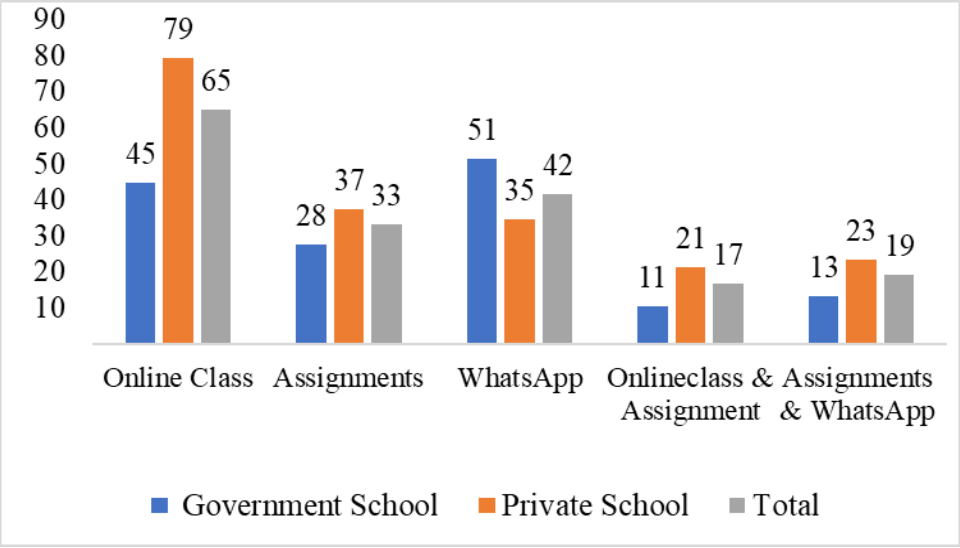


Figure 4.14 Medium of Instruction

Some Government Schools like Islambad Model Schools also conducted online classes and 34 parents whose children are enrolled in governmet schools reported that their children attended online classes. Only 8 parents whose children are enrolled in LFPS reported that the school has been conducted online classes. Sixty parents (MFS) out of 66 reported that school has conducted online classes to facilitate children during pandemic. All HFPS conducted online classes during COVID for provinding children better learning oppurtunities.

Table 4.8 Mode of Instruction by Type of School

	Government School	LFPS	MFPS	HFPS
Online Class	34	8	60	17
Assignments	21	14	18	8
WhatsApp	39	14	17	6
Online Class & Assignment	8	0	15	8
Assignments & WhatsApp	10	12	9	4

Most of the schools reported that they used Software Zoom for conducting online classes, government Schools used only Zoom whereas some High Fee Private Schools also used MS Teams for conducting online classes

4.2.5 Privacy

Question regarding no of rooms in house was also included to determine the privacy status which is required to concentrate on studies, especially while taking online classes' importance of dedicated space and device cannot be ignored. Overall, 32 parents reported that they have only one room for accommodation, 107 reported Two to Four rooms and 32 reported that they have 5 or more rooms to live with their family.

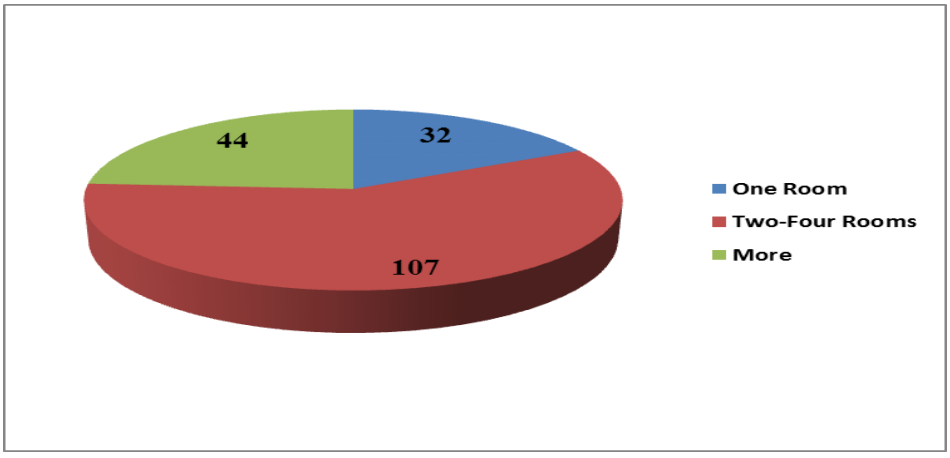


Figure 4.15 No of Rooms in Household

Ninety nine percent parents reported that they have mobile phone, 32 percent reported that they have laptops and 16 percent reported that they have tablets at home. Gap is evident from the graph below while comparing with respect to school type.

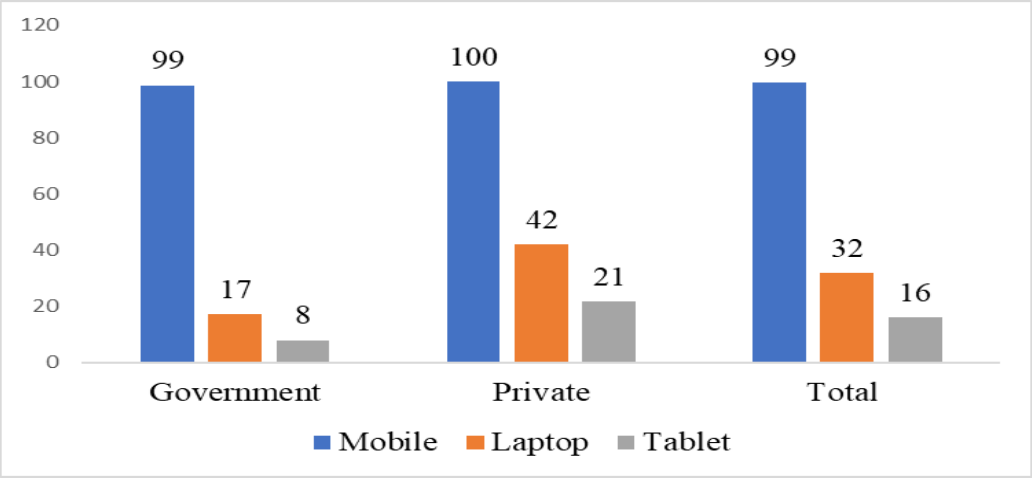


Figure 4.16 Devices at Home

4.2.6 Assessment Methodology

Assessment of Primary school children helped them to learn, grow and developed magnificently. As evaluation is a method for collecting information about children's learning experience, understanding, progress and achievements. On the basis of the results of assessments, educators can plan the future learning and teachers can focus on the weak areas of children. During Pandemic as directed by Education Minister, all the primary school children has been promoted without any assessments. Most of the Government schools' teachers assessed children through their submitted assignments and class tests. Private Schools conducted quizzes while taking online classes or some schools conducted online exams as well. In Rawalpindi, Islamabad on average 63 percent schools assessed children through assignments, 37 percent assessed through Quiz, 53 percent private schools reported online exam and 7 percent private schools took assessments in school.

Table 4.9 Assessment Methodology by Type of School

Percentage	Government School	Private School	Total
Quiz	39	36	37
Online Exam	0	53	31
Assessment School	0	7	4
Assignment	75	54	63

4.2.7 Feedback

Feedback is information provided by teacher about the progress of children. Therefore, feedback from teacher is "consequence of performance "which is an instrumental for child learning. It has been observed that timely feedback from teachers develops a strong linkage between teacher, student and parent which eventually leads to better learning outcomes. Question regarding teachers' feedback was also part of Questionnaire, and in response 26 percent parents reported that teacher didn't provide feedback and 74 percent reported that teachers provide feedback about their children activities and performance during school closure. Feedback from teachers about children impacts parents' satisfaction and improves child learning by informing parents about weakness, gaps and areas to be focus to improve child performance. For this purpose, schools hold meeting while face to face learning, but due to COVID-19 school didn't conduct such meetings to provide feedback to parents about their children performance.

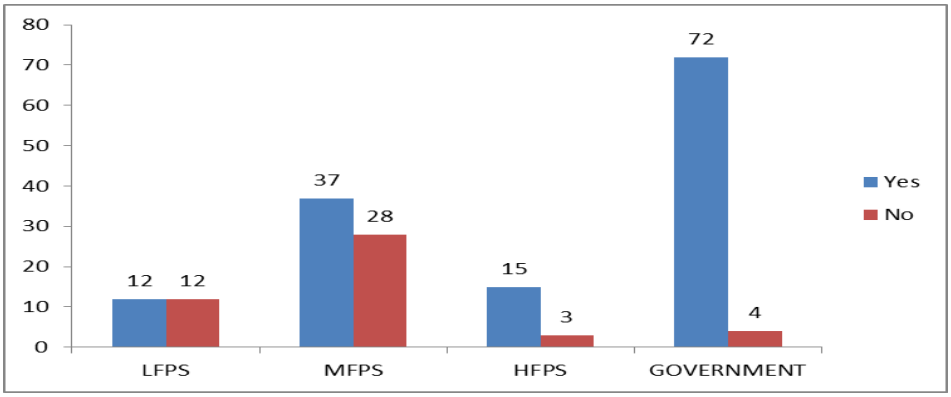


Figure 4.17 Feedback from Teacher

4.2.8 Satisfaction from Child Learning

Satisfaction is the state of fondness or displeasure feeled by the comparison of the actual service with the expected value. In this study, we investigate the parents' satisfaction from online education during COVID. Forty two percent parents reported that they are not satisfied with the learning of children during COVID. Parent of Government School children comparatively found more satisfied than parents of whose children are enrolled in Private schools.

Satisfaction/School Type	Government School	Private School	Total
Satisfied	64	42	106
Not Satisfied	12	65	77
Total	**76**	**107**	**183**

Table 4.10 Satisfaction of Parents from Child Learning

Seventy one percent parents whose children were taking online classes reported that they are not satisfied with children learning and 58 percent reported that they are satisfied with their child learning. 47 percent Parents of children found satisfied with assignments to be completed in stipulated time, on average 46 percent parents reported that they are satisfied with WhatsApp medium.

Table 4.11 Satisfaction of Parents from Medium of Instruction

Parent Satisfaction with Medium			
	Yes	**No**	**Total**
Online Classes	58	71	64
Assignments	47	48	48
WhatsApp	46	43	45

4.2.9 Regression Analysis

Logit Regression Model has been used for analyzing the parent's satisfaction from the learning of enrolled child in primary school by considering it a dependent variable. Variable will take value '1' if parents are satisfied with their child learning and '0' if, not satisfied. Personnel, socio-economic indicators, technical and logistic barriers will be the independent variables of the study.

$$l = Log_b(\frac{p}{1-p}) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots$$

Table 4.12 Model Description

Dimensions	Description
Personnel	Parents qualification, ICT Skills,
Technical	Internet, Mobile Desktop/Laptop, Internet quality
Logistic	School Type, medium of instruction, Assessment, teachers' feedback, Privacy

Table 4.13 Logit Model Output, Parent Perspective

Parent Satisfaction	Coef.	St. Err.	t-value	p-value	[95% Conf	Interval]	Sig
Government	1.539	.705	2.18	.029	.157	2.921	**
Mfps	-.887	.719	-1.23	.217	-2.295	.522	
Hfps	-.618	.862	-0.72	.474	-2.308	1.072	
parent_below matric	-1.634	.904	-1.81	.071	-3.406	.137	*
parent_highlyqualified	-.256	.485	-0.53	.598	-1.205	.694	
Room	.425	.361	1.18	.239	-.282	1.131	
ict_skill	.483	.621	0.78	.437	-.735	1.701	
Internet	.974	.613	1.59	.112	-.228	2.176	
Mobile	2.638	1.586	1.66	.096	-.47	5.747	*
Desktop	.508	.593	0.86	.392	-.654	1.669	
Laptop	.34	.558	0.61	.542	-.754	1.434	
internet_quality	-.96	.429	-2.24	.025	-1.799	-.12	**
online class	-.729	.58	-1.26	.209	-1.866	.408	
whatsapp_video	.073	.504	0.14	.885	-.915	1.061	
Assignment	-.821	.483	-1.70	.089	-1.767	.125	*
online_exam	-.047	.589	-0.08	.936	-1.201	1.107	
assessment_in_school	-1.396	1.217	-1.15	.251	-3.782	.99	
Feedback	-2.152	.563	-3.82	0	-3.255	-1.049	***
Constant	1.063	2.048	0.52	.604	-2.951	5.077	

Mean dependent var	0.579	SD dependent var	0.495
Pseudo r-squared	0.324	Number of obs	183
Chi-square	80.662	Prob > chi2	0.000
Akaike crit. (AIC)	206.415	Bayesian crit. (BIC)	267.395

*** p<.01, ** p<.05, * p<.1(Detailed results are annexed as Annexure-II)

The value of R^2 i.e. 80.662 and p value reflect the significance of model at 0.01, 0.05 and at 0.1 level of significance as shown in table above. It is observed that the variables of Quality of internet along with Parents' qualification and gadgets used during distant learning or while taking online classes found significant predictors. Furthermore, type of school, medium of instructions and feedback from teacher found significant indicators that affects the parent's satisfaction with their children learning during COVID.

As access to good quality internet is pre-requisite of distant learning, internet speed in Pakistan is slower as compared to the internet speed of neighboring countries. there were numerous factors that affected the speed of internet, which includes technology, available backhaul and acquired internet bandwidth. But, in Pakistan, the slow internet speed of broadband and cellular services is because of limitations of max available bandwidth per site, the low penetration of optical fiber cable infrastructure, problems in deployment of telecom infrastructure, and the fragility of the telecom sector. High speed internet encourages more online activities including e-education and e-health, online shopping, paying bills, money transfers and many more. High speed broadband and cellular services create a positive impact on the economy of a country and indirectly makes value addition to other sectors as well. Quality of internet found significant factor that affected parents' satisfaction from child learning but negative sign of the coefficient indicates that parent's dissatisfaction increased with the increase in quality of internet which shows that parents were not satisfied with the quality of education provided by schools during distant learning. If quality of education was an issue in the big cities of Pakistan: Islamabad and Rawalpindi, it can be expected that situation will be vulnerable in the districts like Dadu, Dera Bugti, Badin, Shaheed Sikandar Abad, Khuzdar which are the low ranked districts with respect to Information Communication and Technology in Pakistan.

Teachers feedback to parents about the activities, learning of child also found significant predictor of the dependent variable that is Parents satisfaction from child

learning. Teachers Feedback has a compelling influence on learner achievement. When teachers inform parents about learners' knowledge, understanding, errors and misconceptions - then teaching and learning can be synchronized and powerful. Feedback of teachers makes learning visible. Regular Reporting to parents and families formally in written statement from or through parent teacher meeting build parents' confidence and enable them to assist their child in better way and to focus on their weak areas which in turn improves the student achievement. But negative sign of the coefficient indicates that parent satisfaction decreases with the increase in feedback from teacher which reflects that teacher provided the feedback to the parents whose children did not perform during distant learning period.

Type of schools also found significant predictor as it is observed that parents of the children whose children enrolled in Government school were more satisfied than the parents whose children enrolled in medium fee private schools and High fee private schools, the reason might be the qualification, experience or training of the government school teacher or might be the expectation of the MFPS and HFPS parents from school or teachers.

Number of rooms in a house is being used to assess the privacy, by observing the signs of the coefficients of variable it is observed that privacy also found influencing parent satisfaction from child education during COVID-19. In Pakistan, on average household size is 6 person per household that indicates 4 children per couple as Total Fertility rate of country is 3.2. Therefore, if 4 children have to manage their education at same time, then separate room should be required for children to attend, respond and concentrate on studies. So, the number of rooms at home is found significant contributor to the parent satisfaction. Positive coefficient indicates that parents' satisfaction increases with the increase in number of rooms in home for better concentration and understanding.

Parents with Information and communication skills found satisfied with children learning because they have ability to guide their children about use of technology for

getting benefits form home schooling during school closure. Furthermore, it is observed that parents were not satisfied with the modes adopted by schools including online classes, assignments and WhatsApp videos for provision of education to primary school primary school children required supervision / guidance from patents for taking classes from home or to learn from videos or to complete assignments. From descriptive analysis, it is observed that mostly mothers helped children with their education during COVID along with household chores which increased their physical as well as mental burden. For working parents, management of education of primary school children was a great challenge. Parents found more satisfied with online assessment of their children as compared to physical exams conducted in schools.

As per parents' perspective Technical and Logistic indicators including type of school, feedback from teachers and quality of internet found major factors that affected children learning during pandemic.

4.3 Students Perspective

Technological developments allow us to use several techniques to design the online content for children during school closure due to pandemic. While designing the content for online learning, it is very important to consider the interest, preferences and perception of children to make the learning productive and effective. Preference of the learner leads to the readiness or willingness of the learner to participate in collaborative learning. In this part, we analyzed the Primary school children (attended Grade-5) preceptive regarding online education during COVID.

In March of 2020 in Pakistan, all schools were directed to discontinue the physical classes by considering the spread of COVID-19. Primary schools' classes moved online and school remained closed almost for the whole academic year. This study is designed to investigate student's perspective by considering the following research questions as students are the users of the online education system: -

- Have teachers maintained social contact with students during school closure?
- What type of methodology used by Schools for continuity of education?
- Have they faced any technological, financial or logistic issues during School from home period?
- Have students shared the device with siblings for taking Classes?
- Do they have privacy while taking the Classes?
- Have teacher introduced new content during online classes?
- Who helped them with their studies while school from home, for understanding the content and submission of assignments?

4.3.1 Parents Qualification and Technological Skills

There are some challenges for online learning system that can vary depending on the technological abilities to use gadgets and to download files and install software to access and avail the opportunities to be benefitted from online classes. These challenges are more obvious for children of primary school age. Children may not have access to connectivity or have restricted knowledge of online learning tools, such as computers, laptop or tablet (Fedynich 2014; Wedenoja 2020). Primary school children's online learning and access, depends upon parents / adult supervision. There is a need to consider children's developmental levels to determine the online learning tools, which are appropriate for children's participation and learning.

Qualification of parents along with there ICT Skills has also been explored in study. It is observed that parents with less qualification enrolled their children in Government schools. As in Pakistan, it is a perception that Government schools are not providing quality education and parents with high qualification avoid to enroll their children in Government for better future of children. As education has very strong impact on ICT skills and earnings, therefore, despite of Government instruction about conducting online classes, most of the Government schools were unable to conduct online classes.

About 60 parents whose children are enrolled in Government school has qualification below intermediate. As distant learning for primary school children is dependent on guidance from parents, therefore, it is expected that the education of these children affected a lot during the whole period. As many government schools haven't conducted online classes due to the issues like parents' qualification, internet availability and lack of internet available devices.

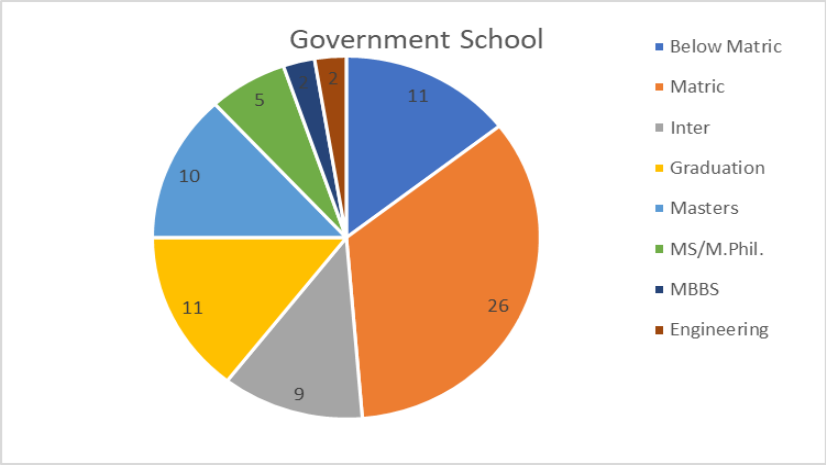


Figure 4.18 Qualification of Parents of Children Enrolled in Government School

Situation of Eduaction is of private school children is better than the childen enrolled in Government schools. Where 40 percent partents reported that they have completed Masters degree whereas only 20 percent reported they are under graduate.

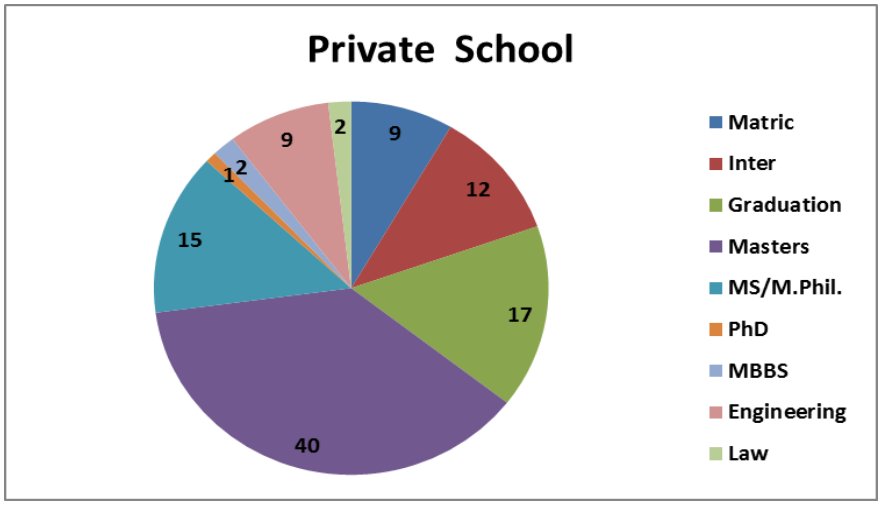


Figure 4.19 Qualification of Parents of Children Enrolled in Private School

There are many communication platforms that are convenient tools for children's online learning, these platforms allow children for real-time class meetings and face-to-face communication with teachers similar to physical classes. Primary school children may not have the technological skills necessary for online learning tasks, such as typing responses into a chat screen or sharing files with written information, therefore, they depend on parents for qualification and ICT Skills.

It is observed that 57 percent of the parents of Government school children don't have any ICT skill as compared to 14 percent Private school children. Only 14 percent parents of Government school children reported that they are able to use any kind of software and 21 percent reported that they can use Word, Excel, PowerPoint tools and only 17 percent are able to send email. ICT skills of the parents of Primary school children although found better than the parents of Government school children but not up to the level that is required to facilitate children to be benefited from E-Learning. It is expected that many children with disadvantaged background remain excluded.

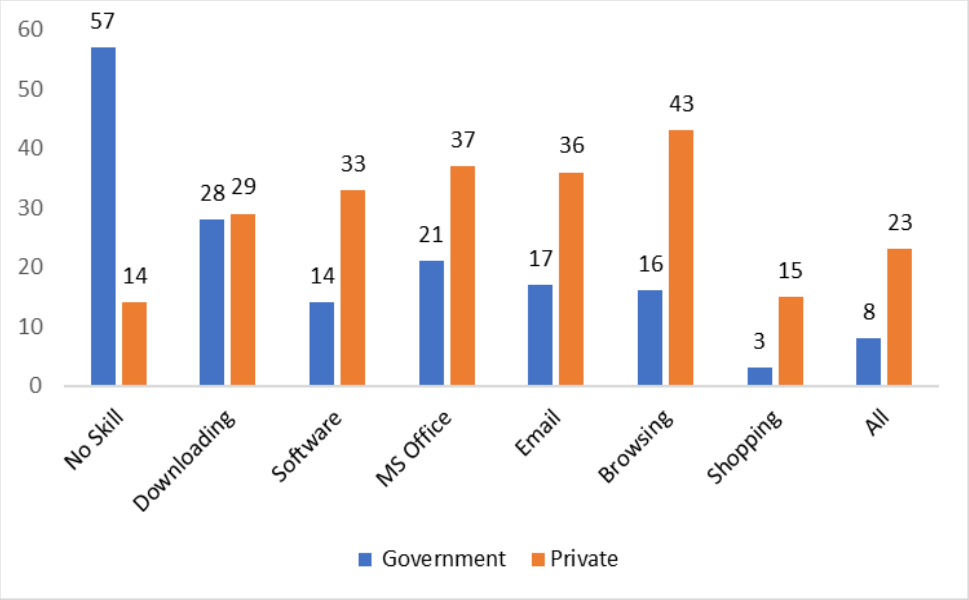


Figure 4.20 Parents by Type of ICT Skills

4.3.2 Privacy

In November 2020, the government started online education tools like tile-school (TV), and android based learning applications that could be freely downloadable. These initiatives were not widely advertised, and hence teachers and students were unaware of these offerings. Numerous children lacked personnel devices due to their humble backgrounds. It is impractical, if a family owns only one smartphone and two to three children have to share device. In response of the question related to separate device for taking online classes or for use during distant learning 56 percent children reported that they don't have separate device and they have to share device with their siblings.

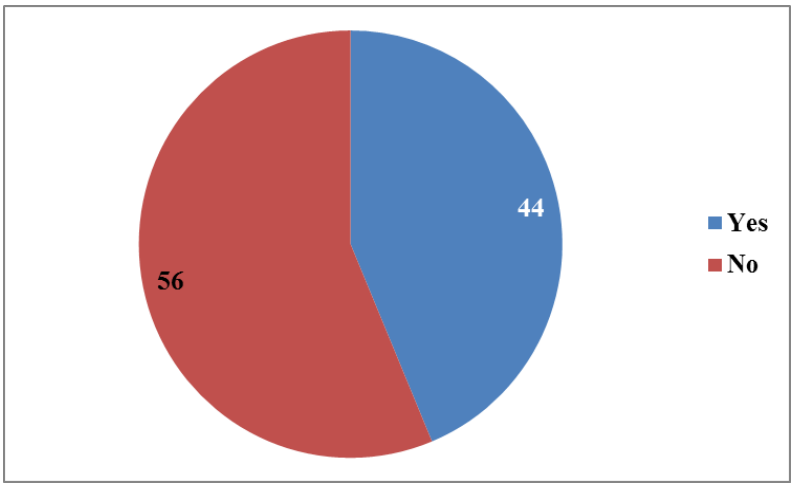


Figure 4.21 Children with Respect to Privacy

By comparing children enrolled in government schools with children enrolled in Private Schools, it is observed that only 20 children out of 76 reported that they have their own separate device for taking online class or to view video for completing their assignment and assigned task. While 60 children enrolled in Private schools out of 107 reported that they have separate device for taking classes or for using them for education purpose during COVID-19 period.

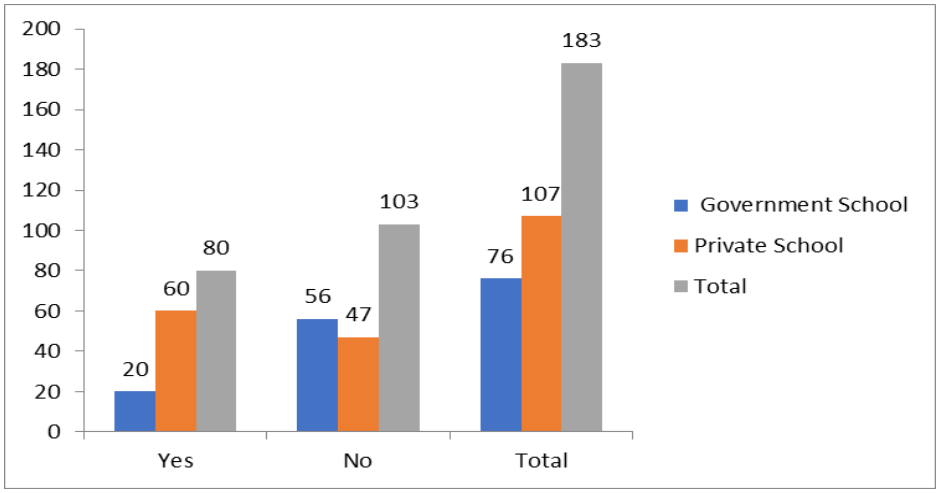


Figure 4.22 Children who have Personal Devices for learning during Pandemic

Study reveal that inequality increased with the type of School, Children enrolled in Governmnet and Low Fee Primary School(LFPS) are less likely to have personel devices to be benefitted from E- learning oppurtunities as compared to children enrolled in Medium Fee Primary School (MFPS) and High Fee Primary Schools (HFPS). The related findings are presented in the table below:

Table 4.14 Children with Personal Devices by Type of School

	Yes	No	Total
Government School	20	56	76
LFPS	8	16	24
MFPS	39	27	66
HFPS	13	4	17
Total	**80**	**103**	**183**

4.3.3 Teacher's Quality / Qualification

Teacher's quality and qualification also plays a vital role in affecting the students' learning in online classes. Teacher's quality refers to a teaching professional who recognizes the educational needs of child and has unique teaching skills, and have ability to understand the students' learning needs. According to Marsh (1991), five

instruments can measure the instructor's quality, in which the most commonly used method was Students' Evaluation of Educational attainment.

In response to question regarding Teacher's qualification, it is observed that mostly teachers are at least graduate. Both Qualifications Government school teachers and Private School teachers found qualified. Issue is the facilities and the socio-economic background of the children, Most of the Government school were unable to conduct online classes due to non-availability of devices and Internet.

Table 4.15 Parents Qualification by Type of School

	LFPS	MFPS	HFPS	Government	Total
Matric but below Intermediate	2	-	-	2	4
Graduate/BS /Degree/Diploma	10	29	4	11	54
M.A/M.Sc.	11	32	10	63	116
M.Phil.	1	4	2	-	7
Ph.D.	0	-	2	-	2
Total	24	65	18	76	183

4.3.4 Social Contact

During physical classroom activities, meaningful interactions between children and teachers result in building relationships among them. This interaction plays important and central roles in students' learning outcomes. Interacting with students in person allows teachers to gauge motivation, engagement, and content understanding, that is more difficult to judge from distance.

The transition to distant learning challenged teacher–student relationships globally. To explore the situation in Islamabad and Rawalpindi, students were asked about "Have their teachers maintained social contact with them?". Fifty eight percent children reported that teacher maintained social contact when required, 13 percent reported that teachers didn't maintain social contact at all. While 14 percent reported

that teachers maintained social contact once in a week and 15 percent reported teachers guide them by contacting them more than once a week.

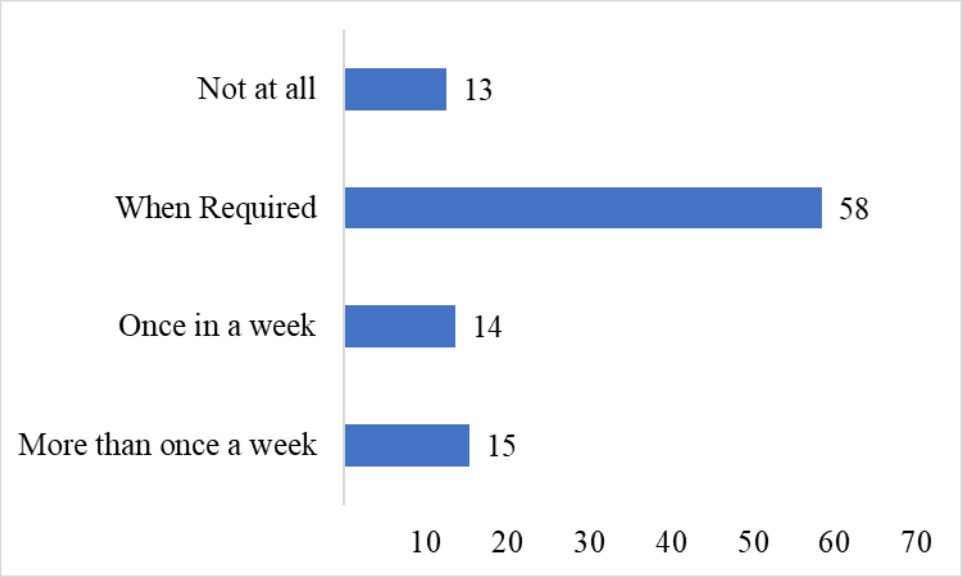


Figure 4.23 Children Social Contact with Teachers

These gaps in teacher–student social contact may increase the expected learning loss, that has already been attributed to the extensive reductions in instructional time, occurred due to pandemic. Teacher's communication with families of children was also disturbed in response to the pandemic, and this was a specific area of concern for teachers due to variation in household environments and their capacity to support distance learning. Children with disadvantaged background, with limited access to technology were more difficult to contact (Stelitano et al., 2020). Hamilton et al. (2020) found that teachers in rural areas often faced their own technological limitations, in addition to the families they served.

4.3.5 Introduction of New Content

School closure was announced in March 2020 and the whole session went online and introduction of new content to the children of primary school age is the biggest challenge for teachers specially when there is no one at home to guide the young children. By considering the fact, many schools and even boards reduced their syllabus to overcome the issue. But further research in the area is required that have

the schools to introduce all the basic content that was required for the grade and students understanding of the content. Private school, especially reduced the content as per their convenience without any approval and mainly taught only few chapters for collecting fees and to pretend that they are providing quality education.

In response of the question regarding introduction of content, 16 percent children reported that teachers didn't introduce new content at all and 58 percent reported that teacher introduced new content depend upon the understanding of children, 14 percent children reported that teachers introduced new content once in week and 12 percent reported introduction of content more than once a week.

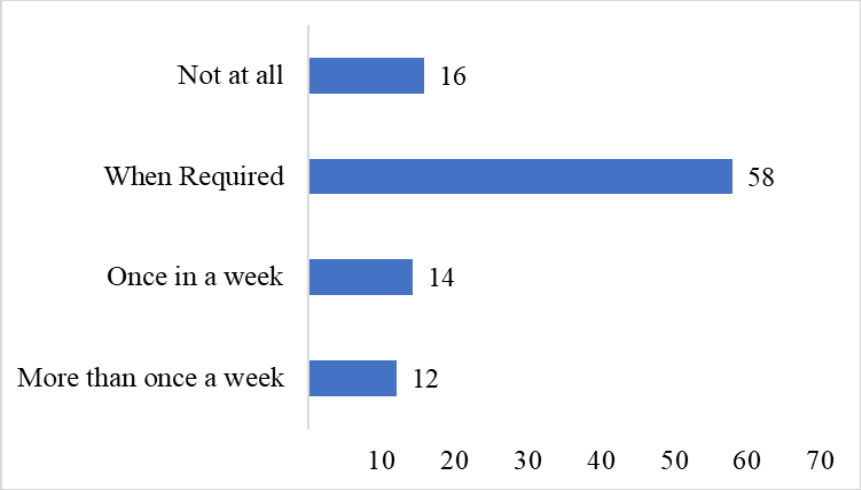


Figure 4.24 Introduction of New Content

4.3.6 Assessment and Child Learning Outcome

Improved learning outcome of students is an important aspect that all stakeholders of an education system usually focus on. A good understanding of student learning is important for parent and teachers' satisfaction, so they can focus their efforts on weak areas that need to be improved and enhanced by using different practices and techniques in the classroom. Policy makers also used examination and assessment data to understand the factors that hinder effective learning to improve future policies. In addition, examinations are necessary for admission to higher studies and for the job

market. A comprehensive assessment and examination system is integral to a good education system.

As from March 2020, whole education system was shifted to the online education and become technology dependent and assessment of children also becomes challenge for schools. Schools adopted different methods for assessment. Government school promoted children to the next class/grade on the basis of submitted assignments or Quizzes. From data it has been observed that 75 children of Government school promoted to next standard on the basis of assignments as compared to 54 percent of Private Schools. While some private schools conducted online exams or some schools also took assessment physically with 53 percent and 7 percent respectively. Some school adopted combination of methodology to asses the children.

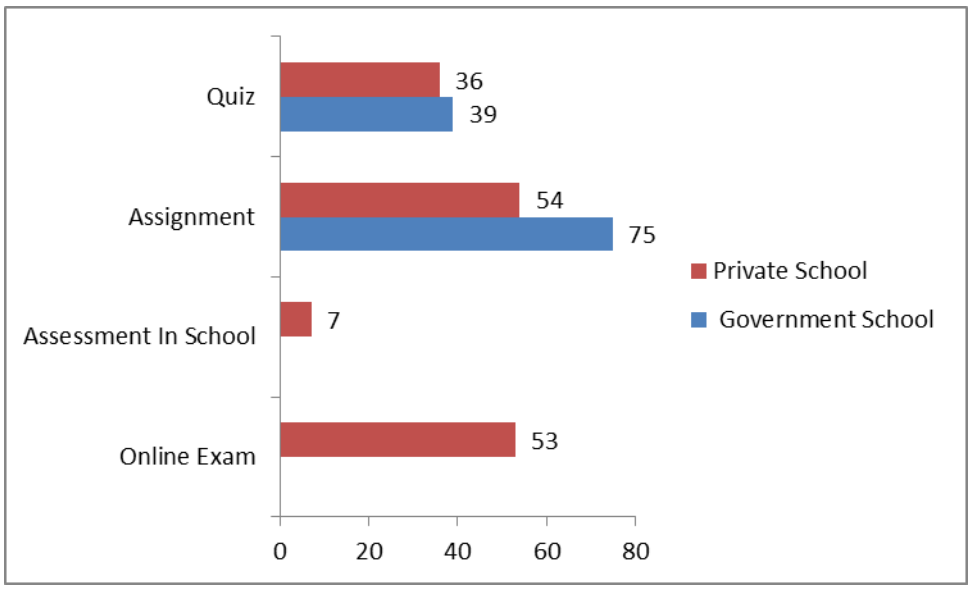


Figure 4.25 Assessment Methodology adopted by School Type

As data was collected in the month of June and July when schools were open for a while after third wave of COVID-19 before summer vacations, assessments of some schools were in process, therefore, data against 57 respondents regarding grades attained in last academic year is missing, therefore, along with questionnaire a general assessment was also shared with children to fill online. Considering the Private school's majority of children reported grades more than 50 percent, 44 children

reported grades between 51-75 percent, 60 reported grades between 76-90 percent and 16 reported grades above 90 percent. These high grades may be because schools introduced limited new content and reduced syllabus.

4.3.7 Regression Analysis

Students are the end users of online education. Their learning as outcome: the grades they attained will be considered as continuous dependent variable; whereas interaction with teacher, understanding of the content (new content), development of new skills regarding online education, along with availability of device and technology will be the independent variable.

The simple linear regression equation is being used to explore the significant factors that impact the learning of children during E- Education period due to school closure to stop the spread of disease.

$$\hat{Y} = b_0 + b_1 X_1 + b_2 X_2 + \ldots + b_p X_p$$

Table 4.16 Model Description

Dimensions	Description
Personnel	Education of Parents, ICT Skills, Privacy, working parents
Technical	Internet, Mobile Desktop/Laptop, Mode of Instructions
Logistic	Social Contact with teacher, School Type, introduction of new content, Assessment

Table 4.17 Logit Model Output, Children Perspective

Percentage	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Government	-5.449	3.56	-1.53	.128	-12.479	1.581	
Mfps	1.927	4.079	0.47	.637	-6.127	9.981	
Hfps	.175	4.96	0.04	.972	-9.62	9.969	
ict_skill	1.281	3.256	0.39	.695	-5.149	7.711	
Internet	1.867	2.841	0.66	.512	-3.744	7.477	
Mobile	-3.169	5.901	-0.54	.592	-14.821	8.484	
laptop_desktop	-1.648	2.583	-0.64	.524	-6.748	3.452	
online_class	6.688	2.859	2.34	.021	1.042	12.334	**
Assignment	-1.945	2.294	-0.85	.398	-6.475	2.585	
whatsapp_video	6.338	2.575	2.46	.015	1.253	11.423	**
online_exam	2.308	3.119	0.74	.46	-3.852	8.468	
assessment_in_school	-6.363	5.76	-1.10	.271	-17.737	5.011	
social_contact	-7.926	3.606	-2.20	.029	-15.046	-.806	**
new_content	6.354	3.058	2.08	.039	.315	12.393	**
working_parents	4.56	2.927	1.56	.121	-1.219	10.339	
parent_belowmatric	-12.662	5.238	-2.42	.017	-23.004	-2.32	**
parent_belowgrduate	-6.126	3.334	-1.84	.068	-12.709	.457	*
parent_highlyqualified	-3.566	3.117	-1.14	.254	-9.722	2.589	
Room	4.094	1.788	2.29	.023	.565	7.624	**
Constant	64.785	9.004	7.20	0	47.006	82.564	***
Mean dependent var		71.311	SD dependent var			15.953	
R-squared		0.371	Number of obs			183	
F-test		5.068	Prob > F			0.000	
Akaike crit. (AIC)		1487.060	Bayesian crit. (BIC)			1551.250	

**** p<.01, ** p<.05, * p<.1(Detailed output is annexed as Annexure-III)*

During Pandemic schools remain closed for almost whole academic year, although Government took initiative to facilitate children at home but due to poor infrastructure and lack of facilities and skills, the learning of children suffered a lot. To investigate the primary school children perspective information regarding their age, parents' education, ICT skills, school type, medium of instruction adopted by school, Mode of assessment and social contact with teachers.

Privacy, medium of instructions, parents' qualification, social contact with teachers and introduction of new content found significant predictors of child learning outcome during school closure due to pandemic. Privacy or separate room is a basic

requirement of children for E-Learning and it is observed that privacy has significant impact on child learning outcome. In Rawalpindi and Islamabad, almost 10 percent households are living in single room house. If 5-6 persons have to live, eat and study in only one room than focus on studies and taking online classes is very difficult which in turn affects the learning of child. Question regarding no of rooms in the house has also been included to analyze the impact percentage of children during home schooling. Sign of the coefficient indicates that the percentage increases with the increase in number of rooms in house.

Learning is rooted in social interaction and processes, pandemic shown that this is true, for better learning the importance of social contact with teacher cannot be denied. So, question regarding maintenance of social contact with teacher was included in questionnaire and the variable found significant predictor of the dependent variable learning outcome. One of the major limitations is the loss of human interaction between teachers and students as Human interaction is fundamental, especially for primary school children. Only good and trained teachers have ability to maintain social contact with children. Interactions, are required to feel emotions, and that cannot be given by distant learning there is no substitute for proper teacher-student interaction. Maintaining social contact with teacher found significant predictor of the dependent variable but negative sign of coefficient indicates that teacher maintained social contact with children who were weak or unable to understand the content or who were not performing well or not taking classes or not submitting assignments in time which affect their grades as well.

During school closure, schools facilitate children to continue education from home school choose medium of instruction by considering their capacity and the capacity of children enrolled in schools. Government schools chose assignments by communicating instructions through WhatsApp. Low fee private schools followed the government schools by considering the limitations and internet access of children. Medium and high fee private schools mostly adopted online classes. It is observed that online classes and WhatsApp videos significantly affect child learning and

coefficient of both variables indicate that child learning/percentage/score improved if the medium of instruction was online classes or communication of instruction through WhatsApp.

Parents qualification found another significant factor that affected the child learning during pandemic, as for the children of primary school age to get benefited from distant learning is not possible without parents' involvement or guidance. This study revealed that the percentage of children decreases if parent qualification is below matric and increases with the increase in parents' qualification. Results indicates that increase in parents' qualification impact child learning but negative sign shows that may be due to work load, parents were unable to guide children properly, as it is observed that mainly mothers helped their children in education and during COVID-19 due to school closure and lockdown mothers have to manage the household chores themselves along with extra duty of fulfilling the requirements of children of home schooling which in turn affected the education quality of children.

Medium of instructions / Quality of internet is also found significant contributor to the child learning outcome. In Pakistan, the access to internet is not universal till date and only 33 percent household have access to internet facility, in Islamabad and Rawalpindi being the big cities of country, the access to internet at household level is 70 percent and 57 percent respectively, but quality of internet is still a question and required immediate attention of Government. If the cities where access is more than 50 percent, education of children suffered due to poor internet quality, what we can aspect for the districts Rajanpur, Tharparkar: 3 percent, Torgarh: 7 percent and many districts of Balochistan where access to the internet is less than 5 percent and where the education statistics are already meditative; it is expected that due to pandemic situation will be worsen and Government serious attention is required in this regard.

Question regarding type of school in which child is enrolled was included in survey. It is observed that Medium Fee Private Schools and High Fee Private Schools with proper Learning Management (LM) system conducted online classes but Government

school and Low Fee Private Schools emphasized on assignments due to lack of facilities and disadvantaged background of children. Some Government schools also conducted online classes where children were able to manage to take online classes. As the sign of regression coefficient indicates that the percentage increases with the change in school type and negative sign of regression coefficient with government school indicates that percentage of children enrolled in government school is lower than the children enrolled in medium fee private school and high fee private school.

Parents ICT skills also indicate that child learning improved with parents' technological skills, Online education of Children of primary schools' children during COVID-19 has been analyzed. During School closure, children required support and guidance from parents. The sign of coefficient of variable ICT skills indicates contribution of parent ICT skill to the child learning. An important point arising from the foregoing study is the fact that family environment factors affect students' use of ICT. There is a widely agreed concept that students' educational attainment achievements are always supported by their families.

As for e-learning, parents have to support children by providing devices and through installation of application and software that is also a prerequisite of E-learning. Lack of parental knowledge about information communication technology significantly impact the child leaning outcome.

Question regarding employment status of parents is included, as if both parents are working then management of school from home can be a challenge especially for a primary school child. As working parents, especially working mothers have to manage child education, household chores and job simultaneously which put tremendous burden on them.

During pandemic in Pakistan except education sector all the economy sectors remained open by considering the economic situation and poverty rate of country. Therefore, parents have to manage education and job as well. As it is observed that

mothers as compared to fathers help their children more with their education and managed all that put tremendous burden on them but the percentage of children of working parents were better than the children whose both patents were not working. This involves further factors that economic condition of children whose both parents are working are better than the ones whose only one parent was working and they can facilitate their children by providing quality network, devices tutor and can guide their children better.

Parents' qualification and privacy found significant contributors that affected children's' grades during COVID-19 as parents were the only support for children during pandemic to help them with their education at home during distant learning. Privacy is also a prerequisite to concentrate on the content. Mode of instruction including online class and content shared through WhatsApp also found significant contributor of children learning during pandemic. Study revealed that as per children's' perspective Personnel, Technical and Logistic dimensions were the main reasons of children learning loss during Pandemic.

4.4 Discussion of Results

Till July 2020, 98.6 percent students across the world were affected by the COVID-19, which constitutes 1.725 billion children and youth of 200 countries from pre-primary to higher education (United Nations, 2020). Homeschooling was introduced by considering need of the time to make learning possible. Teaching techniques available and used for physical learning are not practicable for distant learning. Though a wide range of teaching techniques have been developed worldwide to facilitate children at home during distant learning, teachers who are unaware of use of technology require proper professional development training in order to fulfill the requirements of their students, if schools went close again due to another wave of pandemic.

Although large no of platforms and online educational tools were available for users, but all the stakeholders including teachers, learners and parents being facilitators faced frequent interruptions while using these tools and techniques. Some challenges faced by stakeholders has been highlighted through this research.

Generally identified challenges and barriers with e-learning are connectivity, affordability, lack of infrastructure accessibility, flexibility, satisfaction from learning, maintenance of social contact, these issues raised due to obsolete educational policy and will have long term impact on learning.

Research highlighted considerable issues including access to internet, uninterrupted Internet connection, affordability of devices and privacy. Children with disadvantaged background were unable to be benefited from distant learning due to lack of resources. Lack of parental guidance due to qualification, lack of ICT skills and working parents, especially for young learners of primary school age found considerable challenges. The inherently motivated children are found relatively less affected with respect to their learning as they required less guidance, on the other hand the vulnerable group of students who were already weak in studies faced a lot of difficulties. Furthermore, some competent children from disadvantaged background were suffered a lot due to access and affordability related issues.

According to teachers and parents, the performance of the students was not up to the mark due to reduced school hours of children and lack of social contact with teachers while understanding of new content. Schools conducted online assessments or evaluated children through assignments while some private school conducted physical exams with a lot of trial and error. The approaches adopted by schools to conduct assessment varies as per expertise and facilities. The lockdown of schools has not only affected internal school assessments and examinations but the Board examination as well. Children of government schools have been promoted mainly without assessment as directed by Government to promote children of Grade 1-7 to next class without considering his/her learning.

Distant learning during School closures that has been conducted in controlled environment to keep children socially connected and involved in learning by relying on technology through digital solutions. But all the children and parents didn't have enough resources, knowledge, IT skills to be benefitted from this transition from conventional learning to non-conventional E-learning modes.

Furthermore, most of students didn't have personnel devices at home and poor internet connectivity was another issue. For average and low-income group, the cost of internet is high, and continuous access which is basic requirement of distant learning is a costly business. The teachers were in dilemma to adopt tools to facilitate children by keeping in mind the children's background to facilitate them. Some adopted podcasts to facilitate them; but interactions were restricted. It was very difficult to design such system to fulfill the learning needs by considering the convenience of all the students. Therefore, by considering affordability and access of both devices and connectivity issues, Government Schools and Low free primary schools adopted tools like sharing videos through WhatsApp or assignments to engage children and to facilitate them. Whereas Medium Fee Primary Schools and High Fee Primary Schools preferred Online classes and mainly used (software) Zoom for that purpose.

Non-existence of online teaching infrastructure, professional development, and non-participative nature of the students made distant learning more challenging. Socio-economic conditions, environments at home and standards are not uniform for all the children. Further research in this area should be carried out to support the marginalized groups. Different strategies for provision of online education have been prepared and launched during this pandemic by many educationists and were free for learner. The accessibility and affordability of the available online material for students of diverse economic backgrounds remain a big challenge.

Many parents were not able to fulfill the requirements of online learning due to lack of access or affordability, that badly affected the learning outcome of this group of learners. Government has to facilitate these children by investing time and resources to help children of disadvantaged background. As evaluation of children through

assignments and assessments were carried out from home mainly, therefore, it was challenging for educators to find the authenticity of the work and the actual learning took place. Grading of students was another area of concern as uniform methodology was not developed and adopted. Further, parents guided and supported their children during their learning process, but the degree and extent of support varies greatly and was dependent on capacity, access and affordability.

Pandemic affected every sector of life but during pandemic people learnt different ways of communication and interaction during lockdown. Research questions were focused on the barriers and challenges faced by stakeholders due to this unexpected situation and the ways they adopted to overcome these challenges and barriers. Majority of teachers reported that they tried to maintain communication with students and their parents but quality of internet was the biggest issue they faced during school closure. Almost all teachers tried to introduce new content and assigned different and provided feedback to their students and parents.

While analyzing challenges faced by stakeholders of education system, certain facts emerged as significant predictors in regression analysis. Regarding teachers' quality of internet found crucial requirement for distant learning, to maintain social contact and to deliver online teaching content when schools were closed. Teachers' professional training was found important for providing task differentiation and for providing feedback to students. These findings can be linked with research that emphasizes the importance of teacher competence in successfully attaining relevant educational goals. Training programmes for teachers and their professional degree and gender of teacher found crucial for delivering online lessons and assigning different tasks by considering capacity and needs of children. Teachers who were provided with training regarding searching tools and selecting teaching materials by considering need of children have provided better opportunities and support to their students.

However, it was directed by Education Ministry to promote children till grade 7 without any assessments but private schools conducted assessments; some schools

conducted online exams that were later on submitted through WhatsApp. As assessments were conducted with limitations, some private schools have conducted exams physically in smaller groups at school premises. Assessments are essential, because if online formative assessments would not conducted, it would be difficult for teachers to identify students who need more attention when physical classes resume. After analyzing student needs and capacities, it is necessary for think tanks to make appropriate pre-instructional decisions and to establish a proper Learning Management System (LMS). Furthermore, authentic evaluation and timely feedback are essential components of learning. But all of these found challenging for the educators and the education system due to lack of infrastructure and proper planning.

Although E-learning bring overwhelming challenges for teachers, children's and parents but paved a way towards Online Education System. Parental support is prerequisite of homeschooling children need academic, economic and emotional support from parents.

Different mediums for providing online education have been explored and used by schools and teachers to facilitate children by considering their capacity. Mainly Zoom and WhatsApp have been used for communicating instructions. Different websites and portals have been designed as well to facilitate children. Government of Pakistan also launched tele school for children, first time ever to continue education. Such platforms should be explored further after resuming face-to-face physical classes, as use of these platforms during regular classes will provide additional information and guidance to the children. Teachers should be thankful for taking innovative initiatives to help and to overcome the situation caused by pandemic by adopting virtual modes of instructions. Pandemic encounter teachers, parents and children with un-predictable situation but on the other side has provided them the opportunity to teach and learn by using innovative techniques, a part from the typical classroom setting.

It's important to remember the extraordinary challenges stakeholders faced during distant learning. Schools, teachers, parents, and students performed tremendous efforts to continue academic activities in quarantine. Therefore, this success should be celebrated.

CHAPTER 5.
CONCLUSION & POLICY RECOMMENDATIONS

In Pakistan, Internet quality is quite low as compared to developed world with small number of access points, further by considering the household income, internet access is also very expensive, therefore, access and affordability of quality internet for by common man is insufficient. Policy-level interventions are required to progress in Information and Technology. Further research and study on establishment of effective online education system is need of the day.

There is a dire need to carry out affective studies to develop techniques for evaluation system and provision of timely feedback to ensure reliability of online education system. During COVID-19, access to quality internet and affordability of digital tools for learners belong to diverse economic background is identified as a challenge, for which, the ministry of Education has to pay attention for establishment of mechanism to facilitate disadvantaged group. Distant learning can become inventive, advanced and collaborative by using affective tools. To invest in the specialized training and development of teachers, especially regarding Information Communication and Technology and effective pedagogy by considering is the demand of the day. These measures will prepare the education system of the country for uncertain conditions in the future.

The COVID-19 pandemic teaches a lesson that teachers, parents and students should continue to use innovative online educational tools and techniques, after resuming physical classes to enhance their capacity and for better understanding of content**.** Curriculum should be allied with ICT and opportunities should be provided to students for using advanced digital technologies, tools and resources at school which enable them to use creative ideas and innovative problem-solving techniques. There is need to decrease the ‘gap’ between students’ learning & development at school and skills and practices which children need to enter into the ICT era.

It is observed that most of the teachers were unaware of the use of technological tools in education systems. By learning the lessons from pandemic, firstly gadgets must be introduced to teachers and students in systematic manner and even to their parents being caretakers – digital technology should be introduced into routine teaching and learning processes.

The scenario created due to pandemic has just showed the consequences, if schools will fail to overcome the ICT transformation challenges. Therefore, it becomes essential to provide ICT learning opportunities during professional teachers training to train the teachers about use of technology while communicating with children. Teachers may learn from available reports on the use of good practices that can be adopted for distance learning. Schools should adopt the concept of blended learning, that should be premeditated combination of conventional and un conventional. Further, school is a place for social learning of children, they go to school to meet and greet their friends and perform developmental tasks according to their age, which is important part of their social development.

This study also highlighted the areas of teacher competence including teacher qualification and experience that have impact on teachers' success during challenging time like pandemic. It emphasizes on Digitalization in schools that covers important part, that should not be missed during teacher professional training.

5.1 Limitations

Regardless of promising findings of this study, there are some limitations as well. Firstly, sample was small as schools were closed and when opened, it was very difficult to interact with school management and teachers for data collection due to their workload. Secondly, study was carried out in only in schools of Rawalpindi and Islamabad being big cities and having better environment and infrastructure of both public and private schools, generalization of results to other cities and districts and their educational system is not possible. Though, results can be generalized by considering the infrastructure of marginalized cities/districts of Pakistan that may be

confronted with similar or more challenging situation regarding distant learning during COVID-19 due to complete or partial school lockdown.

5.2 Policy Recommendations regarding E-Learning for COVID-19 and beyond:

The efforts made during pandemic to continue the education system in a short time highlighted that change is possible. We should grab the opportunity for exploring the new ways to address the learning crisis to bring solutions which were considered impossible to implement previously. Access to quality Internet for connectivity will increase the options for distant learning and will ensure quick response during school closures.

Expansion of definition of the right to education to include connectivity will be helpful for removing the barriers and challenges. Curriculum based production of accessible digital and media content should be ensured, that will not only help for quicker response, but for its regular use can create the learning opportunities for children in and out of school.

- To facilitate the children of marginalized areas including remote areas and rural areas, Investment in Infrastructure should be a priority for the Government.
- Access to quality Internet for connectivity will increase options for distant learning and will ensure quick response during school closures.
- Teacher training should include the management of classrooms virtually for improving their presentation skills, maintaining social contact with learners and caregivers and innovative blending of technology into lessons.
- Teacher professional training, provision of support to the parents, use of technologies during normal school days should be the part of education policy

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Annexure-I

Output of Logit Model Teachers Perspective

```
Iteration 0:   log likelihood = -34.052846
Iteration 1:   log likelihood = -22.397114
Iteration 2:   log likelihood = -18.181373
Iteration 3:   log likelihood = -17.336932
Iteration 4:   log likelihood =  -17.31838
Iteration 5:   log likelihood = -17.318322
Iteration 6:   log likelihood = -17.318322

Logistic regression                             Number of obs     =         95
                                                LR chi2(16)       =      33.47
                                                Prob > chi2       =     0.0064
Log likelihood = -17.318322                     Pseudo R2         =     0.4914

------------------------------------------------------------------------------
socail_contact |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
---------------+--------------------------------------------------------------
    experience |  -.0157623   .1308071    -0.12   0.904    -.2721396    .2406149
          male |   -1.36838   1.331226    -1.03   0.304    -3.977535    1.240774
       married |  -.8614093   1.597918    -0.54   0.590    -3.993272    2.270453
completed_edu~n |   .6998552   .4955704     1.41   0.158     -.271445    1.671155
      training |    2.03364   1.350101     1.51   0.132    -.6125098     4.67979
computer_liter~y |  -.2828643    1.22346    -0.23   0.817    -2.680802    2.115073
internet_quali~y |    3.61007   1.313539     2.75   0.006     1.035581     6.18456
    government |  -.4648922   2.585905    -0.18   0.857    -5.533172    4.603388
          mfps |  -1.825079   2.712901    -0.67   0.501    -7.142268    3.492109
          hfps |   .0131411   2.775268     0.00   0.996    -5.426284    5.452566
 medium_online |   1.394496   2.129715     0.65   0.513    -2.779669     5.56866
medium_whatsapp |   .0341643   1.646003     0.02   0.983    -3.191942     3.26027
medium_assignm~s |  -.1454381   1.496891    -0.10   0.923    -3.079291    2.788415
satifaction_ch~e |  -1.854156   1.202358    -1.54   0.123    -4.210734    .5024215
 reduced_salary |  -1.840649   1.195928    -1.54   0.124    -4.184625    .5033272
education_degree |    .505218   .3999671     1.26   0.207    -.2787031    1.289139
          _cons |  -2.139331   3.495992    -0.61   0.541    -8.991351    4.712688
------------------------------------------------------------------------------
```

Annexure-II

Output of Logit Model Parents Perspective

```
Iteration 0:   log likelihood =  -124.5384
Iteration 1:   log likelihood = -85.312595
Iteration 2:   log likelihood = -84.219868
Iteration 3:   log likelihood = -84.207371
Iteration 4:   log likelihood = -84.207368

Logistic regression                             Number of obs     =        183
                                                LR chi2(18)       =      80.66
                                                Prob > chi2       =     0.0000
Log likelihood = -84.207368                     Pseudo R2         =     0.3238

------------------------------------------------------------------------------
parent_satisfaction |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
--------------------+---------------------------------------------------------
         government |    1.539108   .7050445     2.18   0.029      .157246    2.920969
               mfps |   -.8865849   .7188346    -1.23   0.217    -2.295475     .522305
               hfps |   -.6179731   .8624437    -0.72   0.474    -2.308332    1.072385
 parent_belowmatric |   -1.634396   .9039502    -1.81   0.071    -3.406106     .137314
parent_highlyqulified|   -.2555338   .4846459    -0.53   0.598    -1.205422    .6943547
               room |    .4247746   .3605346     1.18   0.239    -.2818601    1.131409
          ict_skill |    .4833368   .6214754     0.78   0.437    -.7347326    1.701406
           internet |    .9737918   .6133557     1.59   0.112    -.2283632    2.175947
             mobile |    2.638368   1.586174     1.66   0.096    -.4704773    5.747212
            desktop |     .507695   .5927012     0.86   0.392    -.6539781    1.669368
             laptop |    .3399622   .5579864     0.61   0.542     -.753671    1.433595
   internet_quality |   -.9595548   .4285254    -2.24   0.025    -1.799449   -.1196605
       online_class |   -.7293314   .5800338    -1.26   0.209    -1.866177    .4075139
      whatsapp_video |    .0729437   .5040807     0.14   0.885    -.9150364    1.060924
         assignment |   -.8205392   .4826577    -1.70   0.089    -1.766531    .1254525
        online_exam |   -.0471334   .5886034    -0.08   0.936    -1.200775    1.106508
assessment_in_school |   -1.396255   1.217245    -1.15   0.251    -3.782012    .9895021
            feedback |    -2.1519   .5628745    -3.82   0.000    -3.255114   -1.048687
               _cons |    1.062648   2.048007     0.52   0.604    -2.951372    5.076668
------------------------------------------------------------------------------
```

Annexure-III

Output of Logit Model Children Perspective

Source	SS	df	MS	Number of obs	=	183
				F(19, 163)	=	5.07
Model	17201.3289	19	905.333101	Prob > F	=	0.0000
Residual	29115.917	163	178.625258	R-squared	=	0.3714
				Adj R-squared	=	0.2981
Total	46317.2459	182	254.490362	Root MSE	=	13.365

percentge	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
government	-5.449016	3.560031	-1.53	0.128	-12.47874	1.580708
mfps	1.926983	4.078804	0.47	0.637	-6.127123	9.98109
hfps	.1746502	4.960145	0.04	0.972	-9.619773	9.969074
ict_skill	1.280857	3.256255	0.39	0.695	-5.149025	7.710739
internet	1.866666	2.841332	0.66	0.512	-3.743899	7.477231
mobile	-3.168681	5.901201	-0.54	0.592	-14.82134	8.483976
laptop_desktop	-1.648112	2.582779	-0.64	0.524	-6.748131	3.451907
online_class	6.68842	2.859254	2.34	0.021	1.042466	12.33437
assignment	-1.945219	2.294105	-0.85	0.398	-6.475214	2.584777
whatsapp_video	6.337906	2.575205	2.46	0.015	1.252843	11.42297
online_exam	2.30786	3.119438	0.74	0.460	-3.851859	8.46758
assessment_in_school	-6.363011	5.760173	-1.10	0.271	-17.73719	5.011169
social_contact	-7.926429	3.605749	-2.20	0.029	-15.04643	-.8064274
new_content	6.353928	3.058103	2.08	0.039	.3153223	12.39253
working_parents	4.559792	2.926623	1.56	0.121	-1.21919	10.33877
parent_belowmatric	-12.66182	5.23759	-2.42	0.017	-23.00409	-2.319542
parent_belowgrduate	-6.12554	3.333791	-1.84	0.068	-12.70853	.4574456
parent_highlyqulified	-3.566271	3.117252	-1.14	0.254	-9.721673	2.589131
room	4.094398	1.78759	2.29	0.023	.5645786	7.624218
_cons	64.78514	9.003809	7.20	0.000	47.006	82.56428