COMPARATIVE STUDY OF PUBLIC AND PRIVATE UNIVERSITIES REGARDING ONLINE LEARNING: CHALLENGES AND OPPORTUNITIES

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ABSTRACT

Title: Comparative Study of Public and Private Universities Regarding Online Learning: Challenges and Opportunities**.**

Online Learning as a concept is the most talked phenomenon over the past two decades. In this research, I present comparative analysis from a systematic literature of public and private universities regarding online learning. The explanatory Sequential mixed method was used in this research work. A stratified random sampling technique was used. The data was collected from the population that consists of 14720 students in Islamabad based upon two public sector universities, 8623 students from two private sector students, 433 faculty members from two private sector universities, and 545 from two public sector universities faculty members. The study's sample size was 323 faculty members (179 from public sector universities and 144 from private sector universities) and 505 students (295 from public sector universities and 210 from private sector universities). Data were analyzed through means, T-test, and thematic Analysis. Results regarding the quantitative section of the research showed that the teaching presence and Learning Platforms were the most relevant challenges reported in public and private universities in Islamabad. Moreover, in terms of opportunities, the study implicates various outcomes for the faculty members and students that mainly address their competencies for online learning and teaching was technological innovation. The analysis from the collected data investigated that university administration should act as a catalyst between students and faculty and develop a proper Learning Management for lifelong learning opportunity.

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Muhammad Aftab

DEDICATED

TO

MY MOST LOVING PARENTS

CHAPTER 1

INTRODUCTION

1.1 Background of the study

Present research study compared the challenges and opportunities regarding online learning in Islamabad's public and private universities. Online learning was introduced soon after the pandemic in institutions where traditional face-to-face in-person learning is practiced worldwide and in Pakistan. Online learning is a mode of engaging students in learning through synchronous and asynchronous modalities. It is a method of education where students learn in a virtual environment. The COVID-19 outbreak disturbed the normal process of learning and teaching in the universities. This situation created substantial challenges to the higher educational institutions. Face-to-face traditional mode of learning was replaced with online learning mode. This shift influenced students in various ways (Li & Che, 2022). During COVID-19 Pandemic, the government closed all educational institutions and higher educational institutions in Pakistan introduced online learning to continue educational activities. The classroom-based learning system was changed into a virtual learning Platforms. A smooth switch to online learning from traditional classroom educationally is difficult to be done immediately. Faculty and students both are expected to face many challenges in this regard (Yeung & Yau, 2022).

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Many universities in Pakistan were not fully prepared to cope with this situation. Most of the university faculty and students were not equipped and familiar with online learning. Universities faced various challenges in this regard. Students and faculty also suffered due to the non-availability and insufficient resources for conducting online classes. Therefore, to fill this gap, researcher felt the need to identify the challenges faced by students and faculty regarding students' online learning Platforms. Various opportunities were also provided to students and faculty to make online learning smooth and effective. Present research also explored the opportunities available to students and faculty regarding online learning. Major challenges confronted by higher educational institutes were insufficient training, internet connectivity issues, institutional support, student engagement and online assessments (Farooq, Rathore & Mansoor, 2020). Moreover, public and private sector universities vary in terms of infrastructure, financial resources, and management practices (Khan & Aajiz, 2018). Therefore, present research compared the online learning challenges and opportunities in public and private universities.

In Pakistan, most higher education institutions employ conventional or face-to-face education, and online education is less widely used. However, several institutions have utilized other strategies, such as independent online and virtual learning. Initially, studying online at the university level was perceived as using applications such as WhatsApp to send voice notes and messages relating to lectures. It appeared as a challenging task for both the faculty and students, using WhatsApp to send and receive the lectures with the notice of parents to accept the responsibility.

In December 2019, the first case(s) of what later came as COVID-19 emerged in Wuhan, China, toppling the world order, particularly regarding social engagements. In March

2020, the World Health Organization (WHO) declared COVID-19 as a pandemic that was affecting lives across the globe. The pandemic resulted in enormous destruction on financial, social, political, and security levels; in particular, it disrupted the education systems worldwide on a large scale. The rundown continues by adding that the schooling system affected by the pandemic contrasted with the other enterprises (Wiesenmayer, 2010).

Online learning permits students to access distribution and sharing of knowledge, which is not quickly accessible in specific geographic regions (Callaway, 2012). This sort of direction during the COVID-19 pandemic encountered definitive confirmation. With an internet-based class, students gained influence in their learning climate, which at last fostered a more critical view of their certification course(s). New learning models are perpetually skipping up looking out, furnishing students with changing chances to design their coaching into something that fits them. It is like a way that permits people to complete a degree they might have begun and could not go on with for some explanation.

While the impacts closure of institution for long time, varied in intensity from country to country, developing countries such as Pakistan faced enormous difficulty in dealing with this health emergency not only in managing its already struggling health infrastructure but also in terms of adapting to the alternative practices in the field of education. In an overall population where youngsters are crippled to keep or use cellphones and PCs, regardless of the web, they need to prepare and grasp the meaning of cutting-edge contraptions for enlightening purpose. The majority of the parents reacted negatively towards addressing class lectures on WhatsApp. At the onset of the pandemic, school administrations in several cities in Pakistan urged the government to take action, forcing them to pay up regular fees for online education. However, the pressure was felt by the students and their parents. As a result, students of the

university level who were not mature enough to use cellular phones were forcibly induced to attend lectures through WhatsApp. Furthermore, students were promoted to the following stages based on their previous results because of the pandemic. From the end of 2020 till the beginning of 2021, students reportedly encountered many challenges resulting from the online learning mode. They asked their faculty about conducting their final term examination online and other questions similar to the educational context (Nosharwan & Abbasi, 2021).

Other than challenges, online learning models have different opportunities as well, particularly considering the advancement in the techniques for learning. Most of the data assembled for this research work was collected from online datasets. This merge includes arranging materials, live conversation accounts, and messages. The above trajectory has been adopted, assuming the area requires further explanation (Bryant & Bates, 2015). The research intends to explore the challenges faced by the students attending public and private sector universities in Pakistan and reflect upon the opportunities created due to shifting towards online teaching and learning.

Present research investigated the challenges and opportunities regarding online learning in the public and private universities of Islamabad.

Terms of online learning, e-Learning, and distance learning have been used interchangeably in my many studies. These terms are also different based on the learning platforms and implementation of these learning systems and modalities in various countries (Moore, Dickson-Deane & Galyen, 2011). In Pakistan two leading institutions, Allama Iqbal Open University (AIOU) and Virtual University are practicing distance learning education. AIOU provides education to remote areas learners who are facing problems of access to educational institutions while VU provides learning opportunities to students with latest

technological resources (Bughio, Abro, & Rashdi, 2014). Moreover, some other universities and educational institutions has also implemented distance learning courses parallel with the traditional system of education i.e. Islamic International University. Online learning is a sort of learning where students and teachers interact with each other through various online modes for accomplishing various learning tasks i.e., lectures and assessment activities.

Distance education is bigger umbrella. Distance Learning is a non-traditional schooling mode which separates teachers and students in terms of time or place. Time and geographical disconnection are managed by various alternative instruction delivery means for distant learners. It is an opportunity for those who cannot avail themselves of a formal education system due to some reasons such as financial and cultural. DL provides a flexible opportunity to students where they can manage content and time at their own pace (Modesto & Gregoriose, 2016). Term "Distance education" is also used for distance learning. It offers access of learning to those students who are distant geographically. Computer is also involved in it. Instructional delivery involved both electronic and print media. When adopting distant learning, the teacher assigns homework and conducts digital check-ins, while the students work remotely from home (Moore, Dickson-Deane & Galyen, 2011). Whereas e-learning covers the course content and teaching methods through various technologies.

Major challenges faced during distance learning in distance educational institutions are managing & designing learning activities, conducting synchronous learning activities, bandwidth, learners' irregularity, individual feedback on students work, maintain quality and training (Bukhsh & Chaudhary, 2015). In online learning, students also face many challenges such as technology-oriented, various intrusions during classes, workload management, digital

competence, assessment, supervision, compatibility with the discipline and socio-economic factors (Adedoyin & Soykan, 2020).

Present research focus is on online learning conducted by majority of the universities of Pakistan after COVID-19 pandemic which were previously following the traditional in person classroom learning. Online learning was implemented due to closure of educational institutions and for continuing the educational activities.

1.2 The Rationale of the Study

In online learning, various important technologies and the internet are used for instructional delivery, developing materials, program management and other educational tasks through synchronous and asynchronous modes (Adedoyin & Soykan, 2020). Bozkurt and Sharma (2020) in their research highlighted that Covid-19 pandemic became the cause of closure of education system. During this situation, instructional delivery through digital transformation came with various attitudinal modifications and logistical challenges (Ribeiro, 2020). Feldman (2020) in his research said that students face negative consequences regarding academic performance due to pandemic anxiety and economic resource differences. Furthermore, teachers were not prepared and trained for quality teaching remotely. Students and teachers faced many challenges due to digital transformation in online learning.

Online learning is accompanied by various challenges such as gravity of hands-on training and technical issues. Besides challenges, online learning during COVID-19 has originated numerous opportunities for students and faculty to strengthen education of students e.g., awareness about application of new technological resources. It also provided opportunities to the educational institutions in establishment of required infrastructure for online learning. Additionally, it also supported the technological innovations in online education. (Jalali et al.,

2023). Online learning has several benefits such as self-pacing, flexibility and interactivity (Smedley, 2010; Wagner et al., 2008).

Present research focused on faculty members and students of public and private universities regarding online learning challenges and opportunities during the crisis response management of COVID-19. In Pakistan public and private sectors are working parallel at all levels including higher education. Both sectors are different in various aspects such as funding, resources, governing bodies, management systems and structures. Therefore, present research focused on comparison of both sectors regarding challenges faced and available opportunities during the online learning to students and faculty. Moreover, students and faculty were considered samples of study as both are major stakeholders and have key roles in online learning. Previous research studies also took the sample of both students and teachers in online learning e.g., Adedoyin and Soykan, (2020) also took sample of both students and faculty for exploring challenges and opportunities in online learning.

The COVID-19 outbreak led to the closure of educational institutions and the implementation of lockdowns across the globe. Nevertheless, this study explicitly brings forth the comparative study between public and private institutions focusing on online learning, challenges faced by students and faculty members in correspondence, and opportunities and resources utilized by students and faculty during online learning. Before the COVID lockdown, most universities in Pakistan followed on-campus learning systems. Only Virtual universities and campuses in big cities followed virtual/online learning. As the Higher Education Commission (HEC) indicated, the prolonged lockdown resulted in food shortages, a closed financial system, unemployment, and increased neediness. The same holds for educational

institutions. The pandemic forced the HEC to make difficult decisions mandating all educational foundations to conduct online courses.

Due to a lack of resources and a poor competence rate, Pakistan's state authorities, for a very long time, could not implement efficient online learning, unlike other developing countries. As per Ndubisi (2004), the primary indicators of successful online learning are not limited to external factors like hardware purchase and setup, faculty and student mechanical mindfulness, or course material planning. Multiple flaws in the country's online learning were exposed during the lockdown, which, had they been identified earlier, would have necessitated an enhanced level of capacity. This research shows the comparative study of online learning challenges and opportunities between the public and private institutions in Islamabad, which shall prove vital in understanding and planning the future of Pakistan's education system(s).

In this view, educational institutions had to confront some significant challenges, especially in the case(s) of countries that needed to be more technologically advanced to ensure a swift shift toward online learning. As a result, traditional classrooms are transmitted into online learning rooms. While the transition mentioned above worked in developed countries, Pakistan had to grapple with a distinct set of challenges to fully introduce and adopt online learning setups. This resulted in prolonged closure(s) of schools, colleges, and universities, both private and public, and later in the form of challenges to train and practice new online education methods. Lack and, in some cases, absence of necessary facilities direly affected the student's academic performance(s) and their mental well-being during the pandemic. Following two years into the pandemic, this research draws a holistic picture of online learning methods through a comparative analysis of its practice in Pakistan's private and public sector universities.

Existing literature focuses on factors that accord significance to online learning. The fulfillment issue is well-established in academic and non-academic (workplace) contexts. Information about student satisfaction helps universities respond even more quickly to the demands of an academic environment that is changing in the commercial world. However, it is essential to mention that not all Pakistani public and private area institutions that offer online courses have been contacted for this research. This work attempts to add to the discourse of online learning techniques used in public and private universities in Pakistan and eventually support the choice to make the point and conduct research on the subject.

1.3 Significance of the Study

The current study represents a significant contribution to the literature as it has studied the comparative perspectives of challenges and opportunities related to online learning. The research findings will be beneficial, particularly from the perspective of students and faculty members from both public and private sector universities in Islamabad for both private and public sector universities students and faculty understanding the challenges faced by students and faculty and the opportunities availed by both beneficiaries; it also supports in resolving these challenges. The main underlying objectives in doing so are to pinpoint the challenges encountered by students during online learning at the university level while exploring the opportunities this mode of learning created in the process. The research also focuses on faculty members' challenges in shifting toward online teaching methods. The study highlights one specific facet of the efficient use of online learning.

The opportunities outweigh the obstacles if a qualitative comparison assists in identifying the best ways to enhance faculty and student satisfaction with online learning by addressing the enormous challenges. Research conducted at the post-graduate level uses

theoretical methods and attempts to produce solution-oriented results. Regarding resources, those pursuing education in the private sector have more opportunities to succeed. A comparative study of online learning strategies for the solutions presented by the study, which are focused on policy, can address the challenges faced by both public and private sector institutions in Pakistan and serve as a means to mitigate future challenges. The recommendation of the research will also be helpful for the university management in resolving the primary challenges experienced by university students and faculty in online learning. It is also helpful for HEC and other stakeholders in the policy-making department to make a brief and comprehensive policy to make it easy for students and faculty of universities.it is also helpful for universities who start online courses in future.

1.4 Statement of the Problem

Educational institutions in Pakistan are based mainly only on traditional face-to-face learning in the physical settings of classrooms. During COVID 19, educational institutions worldwide and Pakistan also shifted from formal classroom learning to online learning. As, online learning concept was new and most students and faculty in Pakistan were unfamiliar with online learning Platforms. Due to this situation, educational institutions faced many challenges regarding online learning. Implementation of online learning also provided various opportunities to students and faculty in this context. Moreover, in Pakistan two sectors public and private are working parallel at Higher Education Level. Keeping in view of this scenario, present research was carried out to compare the public and private sector universities regarding challenges and opportunities of online learning faced by students and faculty.

Moreover, comparative study was needed because the majority of research studies only emphasized challenges and opportunities rather than a comparison of online learning in public

and private universities. This gap of less research work on comparative study of online learning studies research during 2019 years also work as catalyst for conduction research in this area.

1.5 Objectives for the study

1. To identify the challenges faced by students of public and private universities during online learning

2. To explore the opportunities available for students of public and private universities during online learning.

3. To compare the challenges faced by students during online learning in public and private universities

4. To compare the available opportunities for students during online learning in public and private universities

5. To identify the challenges faced by faculty during students' online learning in public and private universities

6. To explore the opportunities available for faculty during students' online learning in public and private universities

7. To compare the challenges faced by faculty during students' online learning in public and private universities

8. To compare the available opportunities for faculty during students' online learning in public and private universities

1.6 Research Questions

1. What are the challenges faced by the students of public and private universities during online learning?

2. What opportunities are available for students of public and private universities during online learning?

3. What are the challenges faced by faculty of public and private universities during students' online learning?

4. What opportunities are available for faculty of public and private universities during students' online learning?

1.7 Null Hypotheses

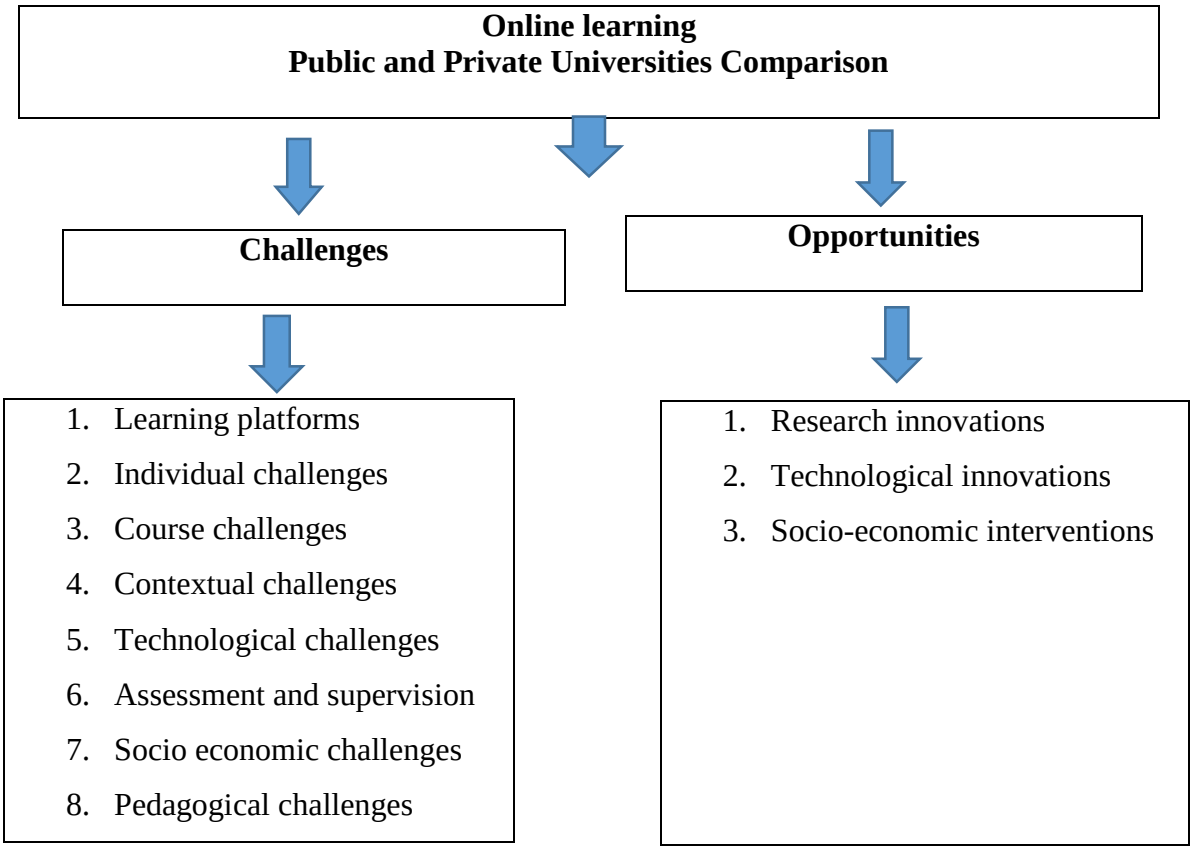
Ho1: There is no significant difference in challenges faced by students during online learning in public and private universities.

Ho2: There is no significant difference in challenges faced by faculty during students' online learning in public and private universities.

Ho3: There is no significant difference in opportunities available for students during online learning in public and private universities.

Ho4: There is no significant difference in opportunities available for faculty during students' online learning in public and private universities.

1.8 Conceptual Framework



Various research studies helped in the development of present research framework. Online learning was practiced before, during and after COVID-19. Different research studies discussed various challenges and opportunities regarding online learning. These studies helped in the development of conceptual framework of research. Ferri, Grifoni and Guzzo (2020) discussed the pedagogical, technological, and social of online learning. Technological challenges are related to access to the infrastructure e.g., technological devices including Internet connectivity. Whereas pedagogical challenges include teachers' skills of using technology for pedagogical purposes, teaching materials and feedback during online learning (Yusuf & Ahmad, 2020). Moreover, social challenges include suitability of environment and support in online learning. Aldowah, Al-Samarraie and Ghazal (2019) in their research study

explored the course, individual and contextual challenges. Course challenges include challenges regarding course design, course content, and activities required for the delivery of course online. Individual challenges include interaction, motivation, time management, workload management and learning strategies. Contextual challenges include contextual factors related to online learning. Adedoyin and Soykan (2020) explored the challenges technological, assessment & supervision, Learning Platforms and socio-economic challenges regarding online learning. In addition to this Adedoyin and Soykan (2020) explored the online learning opportunities of research innovations, technological innovations, and Socio-economic interventions. Stone (2019) explored the challenges of mode of delivery, courses designing for online learning, individual and contextual challenges.

Conceptual framework of present research is based on deductive reasoning model using top-to-the-bottom approach. It uses previous studies to deduct conclusions findings of the previous work on the subject issue.

	Challenges	**Research Studies**
1	Individual challenges	Aldowah, Al-Samarraie, & Ghazal, (2019); Stone, 2019
2	Course challenges	Aldowah, Al-Samarraie, & Ghazal, (2019); Stone, 2019
3	Contextual challenges	Aldowah, Al-Samarraie, & Ghazal, (2019); Stone, 2019
4	Technological challenges	Adedoyin, & Soykan, (2020); Ferri, Grifoni, & Guzzo, (2020)
5	Assessment and supervision	Adedoyin, & Soykan, (2020).
6	Learning platforms	Yeboah, R. (2022).
7	Socio economic challenges	Adedoyin, & Soykan, (2020).
8	Pedagogical challenges	Ferri, Grifoni, & Guzzo, (2020); Yusuf & Ahmad, 2020; Stone, 2019

S. No	Opportunities	Research Studies
1	Research innovations	
2	Technological innovations	Adedoyin, & Soykan, (2020).
3	Socio-economic interventions	

1.9 Operational Definitions

1.9.1 Online Learning

Online learning refers to mechanism via learning management system allowing student to faculty interaction in terms of conn synchronously (real-time) faculty and students interacting at the same time or asynchronously referring to interaction between student and faculty on irregular intervals. Online learning is a mode of engaging students in learning through synchronous and asynchronous modalities. It is a method of education where students learn in a virtual environment.

Challenges

Students and faculty members of universities faced many challenges and availed opportunities as well during online learning. The eight kinds of challenges that have been identified after reviewing of different articles and research papers which already discussed and mentioned in above tale are briefly define below statements.

Learning Platforms

Online teaching and learning platforms are integrated software solutions which makes it possible to engage in e-learning. They provide avenues for transmitting and acquiring knowledge, skills and attitudes through the use of technological equipment such as computers, smartphones, tablets and internet connection (Tosheva, 2016). Online platforms were

previously just static software based courses made up of single-source content and few technological avenues for collaborating. Today, online-learning platforms are more flexible and dynamic to use and can be accessed on different kinds of electronic devices connected to the internet. Contents engaged with on such platforms can be sourced from different avenues which makes the information more dynamic and varied for learning

Individual challenges

Individual challenges represent a significant dimension of practical classes conducting online learning. Understanding challenges that hinder the implementation of the study of online learning technologies and their impact on educational practices can facilitate the implementation of online learning in higher education. Individual challenges need to be adequately worked upon and researched in developing countries.

Variables, such as faculty confidence, motivation and commitment, qualification, and the factors such as motivation, self-discipline, and time management, have been found to impact the efficacy of online learning significantly. The literature also exhibited that individual challenges may be linked to a lack of organizational and technical support, including software and hardware capabilities. As a result, the success or failure of online learning depends mainly on the university's quality of organizational and social support.

Course challenges

Course challenges refer to the significant issues related to course design and support services made available by the organization to the individuals to for effective delivery of online courses.

Contextual challenges

The application of online education occurs within a particular setting. According to the reviewed literature, contextual factors are linked to the success or failure of online learning. Additionally, the organization's policy also has a significant role in encouraging enhanced reliance on online learning. Contextual challenges encompass factors related to organizational and cultural aspects that are significant in the employment of online learning anywhere.

Technological challenges

Online learning depends heavily on technology, particularly the availability of tech devices and internet connectivity can significantly impact the success of online learning. Poor internet connections can limit access to e-learning for both faculty and students. The reliance on technological equipment for online learning and its availability has been a significant challenge in providing education.

Assessment and supervision

There is also the assessment that faculty one way to determine instructional objectives through tests is by incorporating assessment-based learning activities, quizzes and examinations. Although there is extensive literature available on the topics of tests, measurement theory, and analysis, while there is a wealth of literature on tests and measurement theory and analysis, there is a lack of information on the planning, development, and utilization of test items by faculty.

Socio economic challenges

Due to the varying socio-economic status of students, some rely on the computer and free internet provided by educational institutions for online learning activities. However, due to the closure of educational institutions during COVID-19, the process of migration for these

students is expected to be slow due to their dependency on the computer and free internet available at educational institutions, which is impacted by disparities in socio-economic status. It turns out to be incontestable that students with low socioeconomic background will face greater difficulties in migrating as early as expected due to the non-availability of online services available at educational institutions.

Pedagogical challenges

In virtual classrooms, it is important to have diverse pedagogical patterns. The role of faculty in virtual classrooms is more of a moderator and consultant, and the organization of lessons cannot be the same as in a physical classroom. For that learning, specifically supervision and response, should be given in a modified technique.

1.9.2 Opportunities

Like challenges in online learning there were also some opportunities which were observed during online learning. The three kinds of opportunities that have been identified after reviewing of different articles and research papers which already discussed and mentioned in above tale are briefly define below statements.

Research Innovation

The COVID-19 pandemic threatened humanity, given the state of emergency declared by the World Health Organization. As the threat posed by COVID-19 emerged, researchers swiftly mobilized to find both short-term and long-term solutions. There also erupted a necessity for instructional technologists. Particularly researchers' involved researchers have been actively working to find short-term and long-term solutions to address the challenges posed by COVID-19. The increase in participants in online learning during the pandemic has

also presented an opportunity for researchers to advance their research and develop innovations to address the challenges of online learning.

Technological Innovation

The tasks of providing research avenues were burdened upon universities and other research centers worldwide. This was so that researchers' collaboration to produce positive results may be facilitated at the earliest for addressing the challenges posed by COVID-19. As a result of this enhanced workload to be achieved within a short-term frame, Several scientific innovations were produced by some universities to assist in addressing the challenges brought about by the COVID-19 pandemic, those engaged in providing health services for eradicating the pandemic In response to the rapid spread of COVID-19, many universities developed scientific innovations aimed at assisting both their academic community and the general public in slowing down the spread of the virus.

Socioeconomic Intervention

Palliatives were being given to citizens in developed nations to lessen the effects of the lockdown. These methods, including philanthropic contributions to institutions, cannot, in large part, absolve public and private organizations of their obligations.

1.10 Research Approach

In this study, the researcher used mixed methods for conducting the study. The research employed both qualitative and quantitative methodologies. In the quantitative research approach for this study, the researcher needs to collect primary data in a numeric format. A quantitative approach to analysis would be more appropriate. The researcher used self-developed tools for students and faculty separately. For the qualitative section, a semi-structured questionnaire was developed. The researchers conducted interviews with a total of

10 faculty members from public sector universities and an equal number of faculty members from private sector universities.

The interviews focused on the themes mentioned below. 10 students from public sector universities same no of students from private sector universities were also interviewed as per the given theme. The output of challenges faced by university students and faculty have been categorized under questions asked by researchers as "themes," i.e., Obstacles in the Learning Platforms , for each individual, in the course, in the setting, with technology, with evaluation and supervision, with socioeconomic obstacles, and with pedagogical challenges. The opportunities availed by university students and faculty have been categorized under questions asked by researchers as "themes," i.e., research innovations, technological innovations, and socio-economic interventions.

1.11 Population of the Study

The numbers of enrolled students in public universities of Islamabad were 14720 and faculty 545. In private sector universities register students were 8623 and 433 faculty members.

1.12 Sampling Technique

The study employed the stratified random sampling technique for qualitative section of research. Saturation immersion used for theme and sub theme. "Saturation" could be a term that frequently comes up when one is inquisitive about qualitative research and, in specific qualitative interviews. The concept of immersion is related to the number of interviews to be conducted in qualitative research.

1.13 Research sample

From Islamabad, four universities were chosen, two from the private and two from the public sector. Information and data gathered by social science and natural science faculty

members for Educational organizations both in the public and private sectors were included in the study. Students and faculty from four private and public universities in Islamabad made up the study population. The sample of the study size was 321 faculty affiliates (179 from public sector universities and 144 from private sector universities), and about 505 students (295 from public sector universities and 210 from private sector universities) from universities situated in Islamabad were chosen. For the qualitative section, 10 students and faculty members were selected for Islamabad's private and public sector universities. Since the research uses a mixed-method strategy for collecting data, so for the quantitative method, data was collected through tools involving the physical survey method. During the physical surveys, researchers gathered data about the availability of facilities within the universities, their quality, how frequently they are used, and the visuals of students studying there.

1.14 Data collection

The research method chosen for the research involved physical surveys and questionnaires. In order to associate the online learning programs offered by both public and private universities in Islamabad, surveys in various universities were a major requirement. Additionally, questionnaires were also used through which a large amount of data was collected efficiently and effectively from a variety of public and private universities located in Islamabad.

These questionnaires were disseminated to the study collected data from faculty members and students in the departments of social sciences and natural sciences from both public and private universities.

1.15 Delimitations

No study is comprehensive in its objective and leaves specific gaps and limitations that give future studies on the same subject. Following are the delimitations of this research;

1.1. Current research was delimited to students and faculty of two public (NUML & Federal Urdu University) and two private (Riphah International University & Shifa Tameer Millat) universities of Islamabad. Keeping in view the limitation of time and resources, only students and faculty of four universities were selected as a sample of study.

2. Current research was delimited to the individual, course, contextual, technological, assessment & supervision, Learning Platforms , socio economic and pedagogical challenges.

3. Current research was also delimited to the opportunities of research innovations, technological innovations and socio-economic interventions.

4. Only those universities were selected which were offering both social sciences and computer engineering.

5. It is also delimited to those institutions which offered online learning during COVID-19 Pandemic, and were previously offering traditional face to face classroom learning.

CHAPTER 2

LITERATURE REVIEW

2.1 Background of Study

An analysis of existing research demonstrates the need for a much deeper understanding in the information age due to subjects like communication and data innovation and globalized access to knowledge via global networks. In order to address the rising learning needs irrespective of time or space, it is possible and realistic to provide flexible and collaborative online learning opportunities. This study aims to narrow the knowledge gap in how public and private universities operate when it comes to educating their students and to produce a study outlining various educational system techniques in Pakistan. Enormous data has been published to investigate the feasibility and productivity of online modes of education in private and public universities worldwide. Online mode of teaching-learning was promoted during the pandemic among universities and schools in most parts of the world. Different theories and models in the subsequent sections elucidate the problems and contingencies that private and public universities face in adopting the online learning system.

2.2 Significance of Education

Every nation's overall progress depends on the solid foundation that education provides. It is essential for developing nations, yet occasionally it needs to be noticed primarily due to low quality and incompetence. Although the government has tried to enhance the standard and quantity of education for its citizens, Pakistan's inadequate education percentages have only worsened. The government prioritizes quantity over quality in education and stresses it. The government may raise and improve education quality by establishing strict checks and

balances. Toro and Ms (2013) identify and explore the outcomes of the online teaching models. The research explored many population statistics and attributes influencing students' learning outcomes during online education. These features are essential for facilitators and faculty, enabling learning to be more influential. Husain et al. (2012) implied that attributes of the administration and faculty collectively contributed to the quality of education in a broader context. In contrast, the students' and institutions' features and attributes express moderation regarding the quality of education.

Moreover, the study also signified the students' perceptions regarding the quality of education related to their backgrounds and socioeconomic class. Awan (2014) revealed that in the 21st century, education plays a pivotal role in nations' fall and rise. The main reason is worldwide competition in the fields of education and technology. The progress of any country is subject to its core competitiveness. Awan (2011) studied various countries with numerous schooling systems, which Pakistan also carried in his work. The two main types are identified as public and private school systems. In Pakistan, the private school system is dominating because of its acceptability among the people.

The qualification standards of faculty, teaching methodology, syllabus, and academic environment analyze the standard of education. During the 1990s and 2000s, the private sector is the dominant sector for providing quality educational services in terms of comparative and absolute analysis. As per the empirical studies, this percentage of private schools rose to 69 percent overall. Six million children were catered for educational needs by the private sector in the early year 2000. By 2007-08, this figure rose to twelve million– almost equivalent to thirty-four percent of the total enrolment. During this period, the faculty strength increased in private universities. Saeed and Awan (2014) find that private universities eradicate

unawareness and promote students' better educational skills. Awan (2012) argues that private universities are beeping unawareness in developing countries. It is believed that if primary private education is systematically run, it may enhance Pakistan's education level. However, in the 1990s, when there was a cold war era, the disintegration of the Soviet Union entirely resulted in backlash on the educational system, and there was the presence of no private sector institutions during that phase.

2.2.1 Student Behavior

Lameck Ondieki Agasa et. al. (2018) used factor analysis, and found three behavior change factors, i.e., students engaging in drugs, students being disobedient and students engaging in early marital sex explained 58.09 per cent variance of the behavior changes. Mohammad Nur Nobi (2012) studied such confrontational student politics, session jams, limited enrollment opportunities, and lack of modern classroom facilities in public universities are responsible for increasing students' enrollment in private universities.

2.3 COVID-19 and Education System(s)

Before the impact of Coronavirus, vast numbers of research and papers drew comparisons between physical in-person classes and virtual distance courses related to the performance of students at the higher intuitional level and the various spectrum of other curriculum and socio-geographical features. Bonner and Soesmanto, for example, analyzed an alternative systematic study routine in that students studying during first years at business school in Australian University of Griffith can consider their statistical course to be online mode or through engagement with the teacher in person. It is noteworthy to mention that the dual mode system resulted through comparative study with indicating no changes among academic achievement and satisfaction of learning between the two. In California State

University, the study implied that through sound technology and right level of training, university's faculty resources are able to offer lectures both online and in person of business technology course. The similar level of effectiveness is observed while measuring students' grade points.

2.4 Comparing Private and Public Sector Educational Institutions

Despite the fact that every single study limits factor analysis, several studies are now being conducted in Bangladesh that compare private and public university studies. As a result, the current study greatly fills this information and study gap with the aid of factor analysis. The present study's main objective is to deepen understanding of pertinent comparisons between studies of private and public institutions from the viewpoint of students in terms of educational quality and students' satisfaction with the model.

2.4.1 Private Institutions

Quamrul H. Mazumder (2014) presented that the level of entire satisfaction regarding education was higher in the private sector university students compared to low levels of satisfaction in the public sector universities of Bangladesh. A study by Fahmeda Yeasmin et al. (2018), A Comparative Analysis between Private and Public institutional students, related to the hesitation in the English Language in Bangladesh. Her study highlights the reasons for hesitation in the English Language at higher educational levels in Bangladesh. It relates and contrasts the reasons for hesitation in the English Language among the students studying in both private and public sector institutions in Bangladesh.

Jahur and Islam (2007) explore influential factors of private university education. As per them, there are six factors, including course curricula, cost, exposure, human resource, competitiveness, and image, forcing students to study in private sector universities in Pakistan.

According to the study on private universities in Bangladesh by Khalid et al. (2009), private universities were already equipped with the online learning setup due to the high amount of technological resources available to students. Most of the students already had their laptops with adequate computer skills. In addition, the university staff proposed and installed the Learning Management System (LMS) to be used by the students.

However, data showed that regular users of LMS were less than 10 percent, which led to the conclusion that LMS was unpopular and unsuccessful. A survey was conducted by Khalid, Jahan, and Sobhan (2009) on 38 different questions to evaluate the ability of universities to deal with online learning systems. Data were analyzed using descriptive statistics highlighting that students' technological capacity is more than 82 percent.
Furthermore, projects such as "Digital Bangladesh" should be initiated with adequate e-preparedness to adapt to the online learning model. The study concluded that online learning had become a valuable asset for educating a wide range of students.

Despite technological limitations, online learning can still be effectively adopted in developing countries like Bangladesh, which have minimal resources. With the rapid growth of mobile communication device usage in the country and the development of such technology at reduced costs, a well-planned and comprehensive online learning framework will undoubtedly contribute significantly to educational development and, therefore, to poverty alleviation. All digital Bangladesh initiatives of the government and other organizations addressing various target groups should consider adopting and implementing e-preparedness to achieve the maximum return on investment in technology (Khalid, Jahan & Sobhan, 2009)

With the application of online learning, it is anticipated that faculty staff representatives' duties will shift from typical tutor-centric to student-centric, which will benefit

new curriculums. So, the present study focuses on the perceptions of the staff about their experiences and barriers concerning COVID-19. This is through highlighting the challenges which came across learning online. Moreover, the strengths relating to the adoption of online learning and underlying factors are also investigated in the current study.

It would help higher education make online education practically viable not only during a pandemic but also during a non-pandemic state. According to Khalid, Jahan, and Sobhan's (2009) research, the primary challenge in implementing online learning in Bangladesh is the expensive cost of equipment and personal laptops for students. Due to the high cost of laptops, most students cannot afford to buy them. In addition, other barriers to online learning include unstable or non-existent internet access, inadequate English language proficiency, frequent electricity outages, low individual income, limited education budget, insufficient government investment in IT infrastructure, and low education participation resulting from poverty.

2.4.2 Public Institutions

Hakim and Bhuiyan (1995) analyzed that in public sector universities, the cost is lower in higher education (very insignificant) than in private universities. The study further shows that this cost is even cheaper than that in other developed countries (Mutisya & Makokha, 2016). Collected the data using questionnaires handed out to 210 students and 420 lecturers. These questionnaires were then analyzed using descriptive statistics. The study analyzed the challenges faced by both faculty and students. They found that heavy workloads were regarded as the most dreadful challenge faced by lecturers, which affected the effective adoption of online learning modes. Other obstacles being faced include unreliable internet connection, refusal of copyrights for the lecturer's developed online learning courses, limited ICT skills, scarcity of incentives and bonuses, insufficient number of computers, low number of computer

laboratories at the universities, and lack of time appropriate for E-interaction between students and faculty.

On the other hand, the major obstacles faced by students include; the first and most significant is unstable or no internet connectivity, which is followed by: an insufficient number of computers, a low number of computer laboratories, insufficient ICT skills among the students, and lack of adequate time for online interaction with the faculty students as well as staff both are facing intricacies. The adoption of the online learning system is moving slower than expected and is yet at its initial stages in Kenyan Public Universities. The study recommended that all universities increase their funding and invest a handsome amount in the massive enhancement of Online learning infrastructure, up-gradation of online learning, content development, and improvement of online learning awareness.

Another critical research was done by Mutisya and Makokha (2016) in Kenya to examine the hurdles public universities face in switching to the online learning model. Like all universities around the globe, in Kenya, public universities are also adopting the utilization of Online learning platforms in a crucial struggle to manage the high requirement for university education in the country. The results and findings from the research substantiated the claim that public universities in the Republic of Kenya are adopting the online learning system in their optimistic bid to increase the accessibility of higher education in the country. However, embracing the advanced teaching system is still in its initial stages (Mutisya&Makokha, 2016). This is evident from the fact that out of the seven, only two chosen public universities had an online learning policy in their curriculum.

Furthermore, only 35% of students and only 32 percent of lecturers regularly used online learning platforms. Another piece of evidence is that only a minute number of course

units, that is, 10 percent were available online, and a staggering majority of modules online, that is 87 percent, were PDF files consisting of materials included in course books in the past, hence lacking interactivity – a crucial element of the online learning system. University directors also confirmed this slow divergence of online mode of learning platforms in public universities (Mutisya &Makokha, 2016).

2.5 Online Learning

Samir (2014) highlights online learning models' predictions and argues to find ways to motivate students during online learning. The absence of physical contact diminishes students' motivational levels for online learning. Study indicates that one remedy to enhance students' motivational levels is if they are allowed to complete online motivation assessment. As per Saltzbert and Polyson (1995) saying, online learning is considered an instructional model that can be combined with traditional classroom-based courses. To ensure that lecture instruction and learning can take place independent of place and time, resource materials should be accessible to both students and faculty from non-centralized locations.

Kruse (2004) observed that the advantages of online learning are multiple. It includes overall low expenses like exemption from room rentals, and students' transport costs are lowered mainly. Study acquisition time is significantly lowered by approximately forty to sixty percent (Hall, 1997). In India, universities and universities worldwide are bound to cease physical classes due to the fast expansion and growth of the COVID-19 disease. The in-person classes were shifted to virtual classrooms to keep COVID from expanding uncontrollably. Private institutes swiftly followed such an orientation in the classroom scenario. The public-based universities still adapted to the situation because of the reduced facilities and expertise.

In addition, in marking such change, there is an ongoing debate on whether assessments and papers can be conducted through virtual classrooms or other ways.

Farooqui (2020) emphasizes the urgency to address the challenges faced in online learning. With the shift to virtual classrooms, students must spend significant time on mobile and computer screens to keep up with lectures and syllabi. Similarly, faculty must adjust to new ways of conducting classes and managing students. However, advocates of online learning, such as Dinesh Singh, the vice-chancellor of DU, argue that in a country like India with limited resources, online education can leverage technology to reach a larger population of students with fewer faculty. Singh notes that while in-person classrooms have unique benefits, similar benefits can also be attained through dynamic online teaching tools.

The role of tutors is to serve as mentors rather than just standing in front of the classroom as students write down notes. For instance, an exceptional mathematics tutor can lecture online, record the entire lecture, and post it on the Internet along with notes and comments. This allows for comprehensive and insightful learning that anyone can access anytime. However, like all things, online learning has its pros and cons. In India, immediate internet access, accessibility to a computer or smartphone, and the ability to use this technology are still significant challenges, resulting in attendance shortages and participation difficulties for students.

Zaheer, Gondal, and Qadri (2015) found that many students preferred the online learning mode, suggesting that it could help provide secondary education in areas with limited educational institutions. The study identified several factors contributing to student satisfaction, such as the quality of tutorials, faculty, student involvement, content, resources, and the online Learning Platforms . In addition to addressing the shortage of higher education

institutions, the COVID-19 pandemic has made urgent instruction problematic due to the high risk of virus transmission in public spaces.

To mitigate this risk, universities have shifted to online learning models. Muilenburg and Berge (2005) conducted a study that explored the various obstacles faced by students in public universities regarding virtual learning. Their findings revealed that management issues, student motivation, study skills, computer skills, high costs, and limited access to reliable internet connections were significant challenges related to online learning.

2.5.1 Challenges to Online Learning

Aljawarneh et al. (2021), in their work, uncover the hurdles faced during online learning faced by students and faculty. The IT faculty and its students at the University of Benghazi conducted the study. Most healthcare operations were on the verge of collapse, endangering human lives. They contended that among the most affected activities were the institutes of higher learning that had to close. Faculty and students were directed to switch to a drastic online learning change.

Numerous difficulties and drawbacks were faced in this new online Learning Platforms . Their research highlights and examines these challenges, i.e., how online learning impacted the online learning process of students, how faculty are adapting to new teaching techniques, and most importantly, how the setup for online learning has been implemented in the public sector universities have limited resources during this pandemic.

A descriptive-analytical approach is applied in this study (Aljwarneh et al., 2021). The obtained outcomes of such an approach are analyzed comprehensively by statistical methods. A total of two different questionnaires were planned out. The first was distributed among students, and the second was the faculty questionnaire.

The expected results were concluded by using four different features, including the extent to which online learning can be used during this era o the pandemic and the advantages and disadvantages of using online learning tools in the IT faculty. The findings were analyzed, and encouraging results were attained, highlighting the usage of online learning instead of conventional education at the university level in general and during emergencies.

The study (Rashaideh et al., 2021) showed that the students reaffirmed their commitment to online learning and believed its advantages outweighed its disadvantages. The most important use of Copying lectures is possible through online learning. Furthermore, learn from them whenever they want. They strongly emphasize the necessity of online learning and how it has upgraded their academic standards. They do argue that the introductory phase of online learning is challenging. Another obstacle the students faces is an unreliable and slow internet connection. Another major drawback of online learning is that the workload of students has increased and that of faculty has decreased, which is a demanding task for the students.

The study by Alharbi et al. (2021) finds respect for the faculty such that the teaching staff have also reaffirmed their commitment to online learning and highlighted its significance. This will enable the students to enhance their technological skills, which is critical in this modern era. Online learning is the future, and everyone is connected via email and other social networking websites, making it easier to conduct online classrooms. However, the teaching staff also believes online learning has challenges, including the high cost of maintenance and implementation of online learning classrooms. This requires financial support, which needs to be dealt with.

Aboagye (2020) analyses the difficulties students encounter at public universities face in embracing the virtual schooling model during the coronavirus and analyzes further if scholars are ready to study online or need more time. It was concluded in the study that a hybrid approach that combines in-person and online learning should be provided to learners. Another research conducted by Radha (2020) examines the online learning process among students of public universities. The research concluded during the period of lockdown because of the coronavirus pandemic. Online learning among several public sector institutions has become a prevalent culture in academia.

Ali (2018) examined the accomplishment of online acquiring models for university-level students. In a survey, 94.9 percent of the students of private universities were found to be employing distinct virtual learning approaches. In order to scale the interior precision of the aspects, the Alpha test of Cronbach was used to test reliability. The results showed that such students favor online learning as it saves time, is convenient for use, and is usually cheaper. Different researchers have researched and presented different theories regarding the online learning model. They have studied at private and public universities, and the challenges and opportunities faced by both institutions have been discussed.

Most researchers have concluded that private universities have better adopted the online learning model due to better resources for both the university and students. However, there is immense opportunity for public universities. They are gradually adapting to the online learning setup. We will conduct personal research to unveil the opportunities and hurdles encountered by comparing public and private sector institutions.

2.6 International Practices in Online Learning

A survey by "IIT Kanpur" revealed that only 9.3 percent of the 2,789 students successfully downloaded the study material their educational institute referred to continue their studies online. Among them, 34.1 percent of the students had Accessing, and streaming online lectures requires a stable internet connection. "Local Circles" carried out a different survey, which included 25,000 respondents. The survey concluded that only fifty-seven percent of the students acquired the necessary equipment, a computer, and an internet connection in their homes to participate in their online classes effectively.

According to "Takshashila Institution," a public school of policy, regularly administered online education to its students since 2011. With over 3,500 students, the institution had an integrated learning management system to conduct its online classes, with recorded videos and live webinars. The director of Takshashila, Mr. Nitin Pai, explains if online learning promotes interpersonal relationships and thinking skills. He says: It is possible to incorporate brainstorming, mentoring, and interpersonal relationships into the online education scheme only by knowing on utilizing technology and deploying it. The real success depends on the degree to which the students and faculty are comfortable using and adopting the technology. However, on the other hand, he further suggests that in-person classrooms can only partially replace the online learning education model. At the undergraduate level, there is a requirement for better public universities that may bring out talented individuals. Universities provide excellent platforms for diversity, and young individuals may use the opportunity to interact with one another and have beneficial academic exchanges. Online education should be used as a supplement. (Farooqui, 2020)

According to a study conducted by Xiao and Jiang (2009In 2008, Massive Open Online Courses (MOOCs) were established and had robustly and rapidly become a trendsetter in higher education. Nevertheless, on the other hand, the exponential increase in MOOCs, online learning courses, and large-scale intake of students has also caused the problem of quality crisis (Jiang & Xiao, 2009). To counter such problems, Small Private Online Course (SPOC) is considered by leading universities around the globe, including the University of California and Harvard University, Berkeley. SPOCs were first introduced and implemented at the University of California, Berkeley, by Professor Armando Fox. SPOCs are the opposite of MOOCs: Small implies the limitation on the strength of students is less than a thousand in number, and Private signifies the possible prerequisite rules that apply for students engaged in SPOC matching the prerequisites (Zhu & Liu, 2014).

This scale of the SPOC model enables us to plan out more rational teaching pieces of stuff and teaching analysis rules. This can conveniently supply resources for teaching for the students of the university, and its class criteria adopt a combination of one on one and in-person classes as well as virtual self-comprehending, which stands advantageous for faculty at efficiently managing the classroom and personalize their methodology of instructing to match students' learning requirements. Therefore, SPOC is an amalgam of teaching modes that transforms the MOOCs model into effective online learning programs (Zhu & Liu, 2014; Wei, 2012).

In China, the development of a first-class undergraduate curriculum was implemented by the Chinese Ministry of Education in October 2019. in order to flourish the talent as published in October 2018. This distinctly highlights the importance of promoting the online learning advancement through teaching reform, developing a teaching mode that effectively combines online and in-person teaching, effectively promotes small-class teaching and mixed

teaching, to scientifically designing and developing course assessment and content that may foster teaching morals (Ministry of Education of People's Republic of China, 2018).

In October 2019, the Chinese Ministry of Education implemented the development of a high-quality undergraduate curriculum, signifying the need for solid improvements in education and teaching reforms and the incorporation of these reforms' outcomes into the curriculum's construction. It further proposed that teaching methodology signifies interactive nature blended with information communications technology and skills involved in teaching that mentors scholars to enhance their knowledge and self-learning. The report further stated that offline and online courses signify online teaching methodology referring to MOOCs and SPOCs (Ministry of Education of People's Republic of China, 2019).

ZYU's online course dashboard documented and assembled the data, including the names of students, their majors, time durations for student log-ins on the dashboard, and the time they spent while studying online on the dashboard, along with their class test results. The study by Yang (2021) collected this data and out of such conditions, the times of attempts students make to log in to their dashboard, the time they spent while studying online on the dashboard, and the amount of times they posted and commented reflects the quality of learning behavior taking place. The test results of students reflect their attitude toward academics and learning. The data assembled can be categorized into two as per the study. The first one was the data assembled showing the number of attempts the student used to log into the course subject, the time they spent studying online on the dashboard, and the results of their test scores. The second category was the results of their final exams, which all the students gave simultaneously.

The primary aim of collecting and analyzing such two categories of data was to analyze the correlation to examine the relationship between learning outcomes and learning behavior. The study Yang (2021) collected the online learning students' behavior data from 224 sample E-learners. It aimed to examine and analyze the relationship and the existing relationship to explore the correlation between academic achievement and online learning behavior among university students. Results were examined and obtained through the use of the Pearson correlation coefficient. The research collected many experimental data on students' online learning. It then utilized the methodology of statistics and analysis.

The study aimed to examine how the learning outcomes of university students are related to their learning behavior. This was aimed at enlisting multiple ideas and agendas for the subject reform of private universities and presenting some references to implement the SPOC model in private institutions. The results exhibit that students' learning outcome was advantageously related to the number of attempts they visited to watch relevant videos and the number of placements on the forum, and the relevant replies, which depict active participation. They also strengthened the relationship with the test scores they obtained (Yang, 2021).

One of the significant constraints of this study was the ineffective understanding of the population because the study only accumulated data from students of Zhejiang Yuexiu University, which was digital and primary. This sample needed to be more significant to produce effective and fair results. Another limitation was that the online learning behavior data accumulation still needs to be inclusive and complete as it should have been. Although there is no doubt that online learning behavior was influenced by various reasons coupled with the learners themselves, the results highlighted above in this study can instill some understanding of the course reform of private universities (Yang, 2021).

Lorenzo-Alvarez et al. claimed in the study that a radiography course taught at Australian University discovered equal academic outcomes regarding online learning. Cavanaugh and Jacquemin conducted data based on four years of university, which were ten in strength, and the courses were considered as five thousand in this study. The institutes were public sector, out of which Ohio State University was also considered to have face-to-face instruction as a medium for teaching. It was further implored that this study's results indicated no discernible difference in grade-based student achievement for courses where both instructional techniques are applicable. Furthermore, the regression analysis of the study clarified that grades influenced students' GPAs. In online courses, students with higher GPAs appeared to perform better compared to others who had lower GPAs while considering the online mode of the study compared to face-to-face interactive lectures.

In California, at Chapman University, Nyer compared practical ways of quickly taking a virtual class in a subject traditionally given with the help of typical in-person lectures. The such analysis drew a comparison of students' learning results (with the measurement of their assessment scores) by the three distinct ways of giving lectures:

- Typical in-person lectures
- Instructing with the aid of video recording of class lectures
- With the use of static documents giving online lectures with the aid of a transcript, which is edited and included in graphs, charts, and others

Those students who were undergoing online medium of study, referring to video recordings, showed to develop poor quality notes compared to those who were availing face-to-face lecture delivery mode. Furthermore, the effect of instructional material mediated the relationship between perceived note quality and student engagement. Bozkurt et al. is the

primary document showing the consequences of academic disruption amid COVID-19 in thirty-one countries. Further to the assessment in every case, such research insisted on the primary outcomes which arose in the nations as an outcome of the distortion in academics caused due to COVID-19 disease, such as there is no uniformity in the division of internet and is aggravated by a virus, the requirement of another analysis and evaluation methods, which includes the shift to assessments.

The survey resulted in the evaluation of 303 students and 56 faculties at a university in Norway. Hjelsvold et al. studies primarily evaluate facilitators' reactions to learning amid the Corona pandemic's lockdown. According to the research, the primary obstacles to online learning were insufficient facilities and time constraints. The evidence indicates that both students and faculty have no experience with online learning; such research indicated that both classes were accustomed to online learning swiftly and positively related to the change. Following research results, pertinent factors affecting virtual training in the initial days of online learning, and such are the following: in learner's perspective: faculty's feedback, the role of discussion in forms, the role of using tutorials, the role of working in the group through participation; in educator's perspective: a communication with clarity within time regarding all forms of assessments that include course exams, course assignments, and quizzes.

The scholars are informed regarding the tools to learn that include occurring at the same time and not at the same time. Providing guidance to the learners on getting used to the tools and ensuring an atmosphere of conductivity where interactions of the student to student and faculty to student are confirmed, providing guidance and advice to students for setting up their space for study at home and doing their routine work in allocating time for self-study; in the perspective of leaders and administrators: within the time having communication with the

students regarding exam schedules and date sheets, also supporting the learners in coming up with new innovative pedagogical techniques to uplift the quality of learning and to achieve more collaborative approach between facultys and the students.

2.7 Online Learning in Pakistan: Challenges and Opportunities

While there are numerous positive signs, a few difficulties hinder online learning in universities in Islamabad. To begin with, students detailed having restricted admittance to a PC, and the standard of internet supply is conflicting, particularly at student homes. Many students highlighted that because there is limited time for admission, children typically use computers at school. Many people described having trouble accessing online resources due to a lack of accurate data. When they looked at Islamabad's public and private institutions' online learning offerings, they found that the innovation problems were significantly worse.

Only 70 percent of the universities within the city possessed the foundation and equipment to be classified, even though all open private universities in Islamabad declared that they had adequate preparation for online learning. These institutions in the capital area have partial admittance to the internet and are using outdated PC architecture. (Coppola et al., 2002). In an overview of students in three state-funded universities in Islamabad, the acknowledgment of online learning was better than expected. Students that would typically enjoy online learning were younger and more creative.

The talks with college administrators, professors, and students helped the experts see the benefits and competence of Internet learning. The members lauded both the cost-effectiveness and the flexibility of online learning. Despite these helpful ideas, the faculty members did not influence the online learning philosophy. They were, therefore, academically unprepared to use a framework for online learning. (Cox, 2008). The challenges of online learning are that

university students think it would be challenging to create an online Learning Platforms after traditional home-based learning. Because of the abrupt transition, the attendee finds it challenging to adjust to knowledge acquisition based on homeroom work. The public area students at the college continually focus on the typical homeroom outlook. These techniques won the new Learning Platforms with a relatable perspective (Cox, 2008). Most candidates for public universities lack the skills necessary to use and comprehend online learning. They must therefore overcome a variety of challenges while engaging in online learning.

Their understanding of complex problems and many PC applications is poor. Due to this, they have to encounter various obstacles during online learning. Their information on specialized issues and various PC applications is limited. This impacts the quality of online meeting sessions. There is a likelihood that a helpless network makes a hurdle to download enough data indicated with the course, concealed recordings, and many, particularly at public area universities (Crawford-Ferre & Wiest, 2012). Public area universities are confronting the absence of PC instruction.

Countless researchers realistically are functionless personal computers with Microsoft Word and PowerPoint. Moreover, numerous problems occur, and it is therefore considered difficult to tackle such a circumstance. Students encounter problems with online classes, utilizing fitting symbols, Microsoft Office, correlational-related programs and websites, chasing educational stuff, and many other examples. They acknowledge not internet usage, like the ability to log in, live course instructions, generate and accomplish tasks, and talk with facultys and peers (Crawford, Ferre & Wiest, 2012).

The students of public universities have a low level of knowledge of internet usage. They are new to online learning, and they need to learn. This makes them dependent upon the

organizer to book them. Online learning offers flexible time options, in contrast to customary study halls. Some face trouble changing following the time needed for internet teaching (Crawford, Ferre & Wiest, 2012). Attainment at home is a fabulous idea to experience. Students expect data relevant to the grounds of the school. Notwithstanding, college students need to oversee everything in one's life with relatives around them with internet learning. Students can be quickly flustered by little things at home (Finch & Jacobs, 2012). Most college students have learned in the actual study hall. Online learning can cause them to adjust to various learning styles, and a few students can adjust quickly.

These cases need focus, power to comprehend the live classes, and trouble-making activities and tasks utilizing innovation (Finch & Jacobs, 2012). Students need viable relational abilities during online learning. The professionals give tasks for bringing improvement to pursue and composing abilities. However, likely, they would not have the choice to create that faculty understanding of driving their errands. Students can be counted on figure tips to suggest that it is time to argue with their faculty members and companions due to the new education model. It can be for various reasons, including poor mechanical abilities with applications, powerlessness to communicate via live visits, absence of interest, video calls, or instant messages or messages (Finch & Jacobs, 2012).

Through lecture recordings, email, live discussions, messaging, or post-recorded audio and video recordings, online classes help faculty members grasp the readings, assignments, and correspondence. Despite these activities, some children do not understand how virtual setups differ from traditional ones. Typically, these pupils do not approach the professors to ask questions (Gabriel & Kaufield, 2008). Individual students require criticism for their exhibition during the online mode of the learning cycle to improve their ability to learn. The

research also uncovers students' visits in correspondence to their tasks to check their proposals and remarks. The criticism model concerning the web will be muddled for them to comprehend and execute. The chances for online learning are recorded as under:

- Today's adaptive online learning modifies the content in accordance with specific needs by using artificial knowledge. It aids in providing tailored instruction to take into account students' strengths and weaknesses for improved learning outcomes.
- Public and private universities must find a quick web association.
- Both public and private universities should have students access to assistance tools that enable them to handle a variety of concerns by phone, email, or virtual visit. Universities in the public and commercial sectors should consider teaching staff when resolving problems.

- When studying online, time management is both extremely difficult and important to the success of the learning process.
- Public sector universities should let parents know that when studying online, a specific period of time should be set aside with no interruptions from pointless diversions, and a specific location should be reserved for studying before an online lecture. Students must focus on their studies in order to provide their friends and family the greatest possible time.
- Better learning results would be sustained as a result of the learning styles. Students at public and private universities can learn by using audiovisual materials, such as printed lecture notes.

- In order to study more effectively, students must become aware of the importance of correspondence. Students' learning experiences are improved via online learning. It offers a place to relate to and support the others. Appropriately, students can secure from students and enhance their intuitions and limitations. If students have any issues in correspondence, by then quest for help from faculty members and mates.
- Through calls or virtual learning stages, students have the option of speaking with their professors in person to clear up any issue. Clearly, facultys might help students with field trips. With straightforward reading materials that are simple to understand, facultys can help students. After the meeting, students need more time to discuss the material with their classmates and lecturers in order to quickly understand the concept (Gallagher & LaBrie, 2012). Facultys are available to students for feedback on presentation and execution. Faculty should point students in the right route for growth and acknowledge both their weaknesses and strength. Comments can help students improve their approach. There is a chance that pupils may not be able to fully develop their learning if they refuse the recommendations of their professors. In Islamabad, sessions, interactions, and contributions are all fostered online thanks to the current research, which reveals the distinction between these types of learning. It is noteworthy that this analysis does not focus on adopters' insights while applying innovation, but rather on the discernments of the expected adopters. Conventional students who attend regular in-person classes make up our target audience. In essence, exploratory examination queries are needed for the study. Notably, pupils must accept online learning to a certain extent. What is the impact of self-guidance with the acknowledgement of online learning? (Gallagher & LaBrie, 2012).

2.8 Literature Review Summary

The review of past studies necessitates a much deeper understanding of the information age due to communication and data innovation and globalized access to information utilizing worldwide systems. In order to address the rising learning needs while disregarding time or space, it is possible and realistic to provide flexible and collaborative online learning opportunities.

It will be impossible to meet an individual's learning needs and improve the viability of online education at same time as the demand for online learning increases, learning demands and interfaces change, learner composition varies, and the number of learners rises. Online Learning Platforms s can supplement traditional learning by managing need of different learners and online learning preferences by utilizing data and communication innovation along with the right-stated training. The government, businesses, and faculty use technologies to advertise an information society's openings. Online learning gives an arrangement to deep-rooted learners, shifting student-faculty connection to ancient “Sage on the Stage” show to the “Guide on the Side” worldview. Whatever the case, balancing instructions with character traits and learning styles is a particularly difficult task in today's classrooms and online learning platforms.

To create an electronic platform that offers a vibrant Learning Platforms that is learner-centered and accommodates various online learning methods, requirements, and wants, it truly takes a diverse mindset. The web's crisscrossing multidimensional structure, which provides a variety of data and communication channels, strengthens the framework needed in a collaborative and intelligent learning platforms nevertheless, without proper guidance, online learners risk becoming overwhelmed with data and innovation.

CHAPTER 3

METHODS AND PROCEDURES

The study aims to employ an academic approach to analyze and present the data collected in order to provide meaningful insights into the respective struggles of students and faculty members, as well as the challenges and opportunities available to both groups at private and public universities in Islamabad. This chapter discussed the procedures and methods used during the current research study. This study encompasses a detailed description of the research methodology, including the research design, the population under investigation, the sampling technique, and the sample size. The chapter aims to provide a comprehensive understanding of the research methodology, from the pilot testing phase to the data collection process, to ensure the reliability and validity of the research findings.

3.1 Research Methodology

In this research design both qualitative and quantitative approaches are applied. The most important and critical component of a research study is the research methodology. Instrumentation, organization analysis, ethical consideration, research methodology, population, sample size, sampling strategy, instrumentation specifics, data collection procedures, data and study design are all included in this chapter. This chapter explains the methodology used for this study. In this chapter's section, the study methodology was presented and the development of the research was thoroughly covered. The study methodology, population, sampling strategy, sample and data collecting technology, data collection, validity, reliability, and data analysis were all covered in this chapter.

3.2 Research Approach

In this study researcher used mixed method for conducting the study. Both qualitative and quantitative approached were applied here. Quantitative research approach is applied for this study, for the reason that, Researchers must gather primary data numerically, and a quantitative approach to analysis is preferable. Researcher used self-developed tools for students and faculty separately. To develop qualitative semi-structured questionnaire, 10 faculty members overall from public institutions and the same number from private universities were interviewed as per below mentioned themes. 10 students from public sector universities and the same no of students from private sector universities were also interviewed as per given theme. The output of challenges faced by university students and faculty have been categorized under questions asked by researchers as "themes," i.e. Learning Platforms, individual challenges, course challenges, contextual challenges, technological challenge, assessment and supervision, socio- economic challenges and pedagogical challenges. The opportunities availed by university students and faculty have been categorized under questions asked by researchers as "themes," i.e. research innovations, technological innovations and socio-economic interventions.

3.3 Research Design

In this study, an explanatory sequential technique was applied. The quantitative analysis deals with numbers and graphs to confirm or test theories. This type of analysis is used to establish the facts concerning a certain subject. By selecting an appropriate research design, the researcher may minimize data inaccuracy because research design helps the research be consistent and gain an all-out-efficacy in the study.

3.4 Population of the Study

Population of the present study was students and faculty of two public and two private universities of Islamabad. It was further delimited to social sciences and engineering students of these universities. The total no of students enrolled in social sciences and engineering in public sector universities were 14720, and faculty members teaching here were 545. The students enrolled in two private sector universities were 8623 and faculty members were 433.

Students and faculty members from social sciences and computer engineering were selected due to the nature of study and the technicality involved in computer engineering. Online learning is not easy in case of computer engineering without using any lap or physical presentation.

Table 3.1

Population of the study

Universities	**Number**	**Population**	
Public Sector	2	Students	Faculty
		14720	545
Private Sector	2	8623	433

3.5 Sample Size and Sampling Technique

Stratified random sampling technique was used to select sample size of faculty and students from public and private universities of Islamabad. Initially, keeping in view the comparative nature of study, two strata consisting of two public and two private universities were made. Under each stratum, two further strata of students and faculty were made.

Students and faculty from four private and public universities in Islamabad made up the study's population. For this research study, 323 faculty members (179 from the public sector and 144 from private sector universities) and about 505 students (295 from public sector universities and 210 from private sector universities) from universities situated in Islamabad were chosen. Information from the faculty and students of private and public universities in Islamabad was obtained.

Table 3.2

Details of Sample Size

Universities	Population		Calculated Sample Size		Returned Responses	
Public Sector	Students	Faculty	Students	Faculty	Students	Faculty
	14720	545	375	226	295	179
Private Sector	8623	433	264	204	210	144

An online calculator was used for calculating the sample size. Cohen, Manion and Morrison, (2007) proposed the use of online for calculating the sample size. It used confidence level of 95% with 5% margin of error. Students at public universities were 14720 whereas estimated sample size was 375 and returned responses were 295. Students at private universities were 8632 whereas estimated sample size was 264 and returned responses were 210. Faculty at public universities were 545 whereas estimated sample size was 266 and returned responses

were 179. Faculty at private universities were 433 whereas estimated sample size was 204 and returned responses were 144.

3.6 Research Instrument

There were two questionnaires used in the current research. One questionnaire was used for the students and second was used for faculty members to compare the challenges and available opportunities regarding online learning in two sectors, there were of total 55 Questions in each questionnaire. Both questionnaires were consisted of eight challenges (individual, course, contextual, technological, assessment & supervision, Learning Platforms , socio economic and pedagogical) and three opportunities (research innovations, technological innovations and socio-economic interventions). Each challenge and opportunity contain five questions. Researcher self-developed the tools for students and faculty separately.

Same statements and same challenges and opportunities were used in both teachers and students' online challenges and opportunities questionnaire as area of concern was online learning. Students were asked about the challenges faced during online learning and available opportunities in online learning. Moreover, teachers were also asked about the challenges faced by teachers about students' online learning and available opportunities in this context. Another reason for using the same statements and challenges and opportunities was that it is a comparative study and for comparison the same criterions are required. Moreover, while designing the statement it was also considered that these statements fit for both students and faculty. Furthermore, instructions were also provided at the beginning of questionnaire for more clarity on both questionnaires.

Researcher used self-developed tools for students and faculty separately. Three subject specialists helped the researcher validate the tool. The tool that the researcher created

underwent validation by professionals in the field of education. Two specialists from the Education Department at the National University of Modern Languages in Islamabad (NUML) and one specialist from National Defense University (NDU) Islamabad received the tools. Copies of the validity certificate, the covering letter, and the researcher's synopsis were included with the questionnaire. Those professionals sort through research resources in light of their goals. Researchers developed some tool modifications in the light of insightful advice from experts. Researcher modified the tools as per instruction and guideline received from subject expert. The language of the questionnaires was simplified by subject expert.

For qualitative semi structured questioner developed, 10 faculty members overall from public institutions and the same number from private universities were interviewed as per below mentioned themes. 10 students from public sector universities and the same no of students from private sector universities were also interviewed as per given theme.

3.6.1 Suggestion Incorporated Given by Experts

Experts helped in the development and corrections of statements, improvement of grammatical errors and selection of rating scale. Initially a 4-point rating scale was used. Experts suggested a 5-point rating scale ranging from strongly agree to strongly disagree. Examples of few statements are as under:

	Previous Statements	**Suggested Statements**
Technological interventions	Availed new modes of communication	Availability of new modes of communications
	Learnt about advanced software.	Latest innovations in new software/ LMS
Socio-economic interventions	Saved the cost of transportation and travelling time	Cost efficient in term of expenditure and time

All these suggestions were incorporated before data collection. Validity certificates were taken and attached in the annexures.

3.7 Pilot Testing

One hundred sixty respondents were selected for pilot testing. 90 student respondents and 70 faculty members from Public sector universities and 70 students and 40 faculty members from private sector universities.

3.8 Tools Validity and Reliability

The process of certifying a data collection tool is known as tool validity. A test that checks what it is intended to evaluate is said to be valid. Three subject specialists helped the researcher validate the tool. The tool that the researcher created underwent validation by professionals in the field of education. Copies of the validity certificate, the covering letter, and the researcher's synopsis were included with the questionnaire. Those professionals sort through research resources in light of goals. Researchers developed some tool modifications in light of the insightful advice from experts. When a test yields consistent, reproducible, and precise results, it is said to be reliable. In order to determine if the tool was reliable or not, the research also conducted pilot testing by asking some of the respondents for their responses to questions. The data was entered into SPSS once the responses were received from the researcher's choice of some of the respondents who were requested to complete the questionnaire for this purpose. The tool's reliability was examined using the Cronbach's alpha test.

3.9 Reliability of Tool Developed for Faculty

Table no 3.5

Construct	No. of Items	Cronbach' Alpha
Learning Platforms	5	.948
Individual challenges	5	.946
Course challenges	5	.946
Technological challenges	5	.946
Assessment and supervision challenges	5	.946
Socio-economic Challenges	5	.946
Pedagogical Challenges	5	.933
Contextual Challenges	5	.952
Research Innovations	5	.954
Technological innovations	5	.902
Socio Economic Intervention	5	.952
Overall Reliability	55	.967

A reliability analysis was carried out on the challenges faced by the faculty in the university during online learning. "Cronbach's value is .967 which is above 0.80". It shows that the questionnaire reaches acceptable reliability, $\alpha = 0.967$. Most of the items appeared to be retained. This tool is reliable and well-constructed enough to collect data.

3.10 Reliability of Tool Developed for Students

Table 3.6

Construct	No of Items	Cronbach's Alpha
Learning Platforms	5	.948
Course challenges	5	.846
Technological challenges	5	.946
Assessment and supervision challenges	5	.839
Socio-economic Challenges	5	.831
Pedagogical Challenges	5	.933
Contextual Challenges	5	.952
Research Innovations	5	.845
Technological innovations	5	.839
Research Innovations	5	.910
Socioeconomic Intervention	5	.921
Overall Reliability	55	.876

Reliability analysis was carried out on the challenges faced by the students in the university during online learning. "Cronbach's value is .876, which is above 0.80". It shows that the questionnaire reached acceptable reliability, $\alpha = 0.876$. Most of the items appeared to be retained. The research instrument is very reliable and well developed, good for collect data.

3.11 Data Collection Process

In a research data collection is a process of collecting data through a research instrument from a selected population and analyzing that data in order to define and draw

findings and conclusions. Physical surveys and questionnaires constitute a major part of the research methodology. It was necessary to survey universities in order to compare the online learning provided by the public and private universities in Islamabad. The second strategy was employing questionnaires, which allowed us to collect a significant amount of data quickly and efficiently from numerous public and private universities in Islamabad.

Many attempts were made to select the desired calculated sample size through various modes of data collection. Number of returned responses which were less as compared to actual calculated sample size was one of the limitations of present research.

The faculty and students at public and private universities who study social science and engineering, were given these questionnaires to complete. In the qualitative section, to acquire information about the difficulties faced with online instruction and learning as well as the opportunities available, semi-structured in-depth interviews with faculty and students were performed. There was no set limit or limitation for the open-ended queries. From both private and public universities in Islamabad, ten students and the same number of faculty were questioned. Data organization is the process of organizing data gathered through a research instrument. To organize the collected data, an identification code was given to each respondent questionnaire on the top right corner to easily enter the data into SPSS and check in case of any discrepancy.

3.12 Data Analysis

Examining, purifying, converting, and modeling data is the process of conducting data analysis. The goal is to find relevant information that can help draw conclusions and enhance decision-making.

Table 3.7

Data Analysis Description

Objectives of the Study	**Tests for Quantitative Section**	**Test for Qualitative Section**
To identify the challenges faced by students of public and private universities during online learning.	Mean	Thematic analysis
To explore the opportunities available for students of public and private universities during online learning.	Mean	Thematic analysis
To compare the challenges faced by students during online learning in public and private universities	Independent sample t-test	
To compare the available opportunities for students during online learning in public and private universities	Independent sample t-test	
To identify the challenges faced by faculty during students' online learning in public and private universities	Mean	Thematic analysis
To explore the opportunities available for faculty during students' online learning in public and private universities	Mean	Thematic analysis
To compare the challenges faced by faculty during students' online learning in public and private universities	Independent sample t-test	

To compare the available opportunities for faculty during students' online learning in public and private universities	Independent sample t-test

SD= Standard deviation

3.13 Ethical Considerations of the Research

While conducting research projects, a researcher is obliged to adhere to particular ethical standards. Since no responder was coerced into providing an answer against their choice, the researcher complied with research ethics. The investigator sent Google form for quantitative part and interview for qualitative part, requested students and faculty Participants in the study were given ample time and freedom to complete the questionnaire and interview, without feeling coerced or rushed. They were allowed to fill out the forms over the course of one or two days, at their convenience.

Moreover, the participants were explicitly informed that the data collected would be used exclusively for research purposes, and would not be disclosed to any external authority. To ensure confidentiality, participants were given the option to withhold their identities by omitting their names from the questionnaire and interview responses, so that they should feel uncomfortable providing such information.

CHAPTER 4

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

Current chapter is based on the tabular representation of the data obtained from a total of 505 students and 323 faculty members affiliated with two public and two private universities in Islamabad. The data analysis was conducted using SPSS 21st version, a widely recognized statistical software. The study utilized a mixed-method research approach, incorporating both quantitative and qualitative research methods. In addition, a comparative research method was implemented to draw comparisons between the problems that online learning presents to both students and faculty.

The study is classified as both inferential and descriptive, as it aims to fulfill specific research objectives related to the challenges and opportunities of online learning. Specifically, the study focuses on a single variable, namely, the challenges and opportunities of online learning. The study's goal is to examine the challenges faculty and students at both private and public institutions in Islamabad encounter and compare these challenges among university students and faculty members. The study is inferential and the study is comparative in nature, the researcher utilized an independent sample t-test to draw a comparison between the challenges faced by students and faculty members and faculty of both public and private universities. For the purpose of data collection, the researcher utilized a self-developed questionnaire that was specifically designed to assess the challenges associated with online learning.

The questionnaire was structured around the variable of challenges, and it served as the primary instrument for collecting data from both students and faculty members like Learning

Platforms , course challenges, individual challenges, contextual, technological challenges etc Garrison, D. R., Anderson, T., & Archer, W. (2000). The questionnaire used in the study consisted of 5 subscales, which are presented in Appendix E.

The data collected through the questionnaire was analyzed using mean scores and an independent t-test, as determined by the study's research design. The researcher carried out a comprehensive analysis and interpretation of the collected data, aiming to provide meaningful insights into the challenges associated with online learning, as perceived by students and faculty members.

In this study, faculty and students answer questions about online learning, including its challenges and opportunities. In order to collect the qualitative data, researchers developed questionnaires and in-depth interviews with faculty and students from both private and public universities in Islamabad. The "Likert scale," which has five parts, is part of the research instruments. Study sample includes the engineering/IT and social sciences university's faculty members, students of the private sector and public sector universities of ICT. This consists of the comprehensive analysis of study tools, objectives, tools, collected data, tests applied to those data and their interpretations. It consists of the sections mentioned below.

4.2 Section Wise analysis

The research was mixed method, so both quantitative and qualitative section separately interrupted in order to compare the challenges and opportunities of online learning at public and private universities, Google forms were utilized for data collecting. For qualitative data collection the Five Point Likert's Scale was used in the creation of the questionnaire for the

quantitative section, while the researcher interviewed faculty members and students at particular universities for the qualitative data.

4.3 Demographic Information

The most crucial element of the study is the demographics portion, which provides information about the respondents' backgrounds. The tool demographics, tables, and their description were included in this chapter.

Demographics

Table No 4.1

Sector wise demographic data of students

Sector	Frequency	Percent
Public	295	58.5
Private	210	41.5
Total	505	100.0

Table no 4.1 shows sector-wise demographic details of students. This table reveals that the 58.5 % students were from the public sector, while 41.5 % students were from the private sector.

Table No 4.2

Education-*wise demographic data*

Education	Frequency	Percent
BS	233	46.1
Masters	147	29.1
MS/MPhil	88	17.4
Others	37	7.4
Total	505	100.0

Table no 4.2 shows that 46.1 % students were in BS class, 29.1% students were in Masters Class, 17.4 % students were from MS/M.Phil. Class and other than these classes were 7.4 %.

4.4 Quantitative Section Analysis

4.5.1 Student's challenges and opportunities

Objective No 1: To identify the challenges faced by students of public and private universities during online learning.

Question: What are the challenges faced by the students of public and private universities during online learning?

Table 4.3

Challenges faced by students of public sector during online learning

Challenges	Public Universities	Private Universities
	Mean (Remarks)	Mean (Remarks)
Learning Environment	4.09 (Agree)	3.91 (Agree)
Contextual Challenges	4.10 (Agree)	3.92 (Agree)

Individual Challenges	1.96 (Disagree)	2.15 (Disagree)
Course Challenges	1.97 (Disagree)	2.15 (Disagree)
Technological Challenges	1.8 (Disagree)	1.99 (Disagree)
Assessment &Supervision challenges	1.90 (Disagree)	2.05 (Disagree)
Socio-economic Challenges	1.88 (Disagree)	2.00(Disagree)
Pedagogical Challenges	2.0 (Disagree)	2.15 (Disagree)

Table 4.3 shows challenges faced by students of public and private universities during online learning. Results of mean score showed that students of public and private universities were agreed that they faced Learning Platforms (Public: M=4.09, Private: M=3.91) and contextual challenges (Public: M=4.10, Private: M=3.92). The mean score of individual challenge, technological challenges, assessment and supervision challenges, socio economic challenges, pedagogical challenges and course challenges showed disagreement about these challenges faced by students during online learning.

Objective No 2: To explore the opportunities available for students of public and private universities during online learning

Question: What opportunities are available for students of public and private universities during online learning?

Table 4.4

Opportunities available for students at public sector universities during online classes

Opportunities	Public University Students	Private Universities Students
	Mean (Remarks)	Mean (Remarks)
Research Innovations	2.17 (Disagree)	2.00 (Disagree)
Technological Innovations	2.10 (Disagree)	` 2.17 (Disagree)
Socio-economic interventions	2.10 (Disagree)	1.94 (Disagree)

Table 4.4 show the mean values regarding the opportunities available for students during online classes in public and private universities. This table shows that students of both public and private universities showed disagreed attitude towards available opportunities of technological innovation (Public: M=2.10, Private: M=2.17), research innovations (Public: M=2.17, Private: M=2.00) and socio-economic intervention (Public: M=2.10, Private: M=1.94).

Objective No 3: To compare the challenges faced by students during online learning in public and private universities

Ho_1: There is no significant difference in challenges faced by students during online learning in public and private universities.

Differences among Learning Platforms , Contextual Challenges, Teaching Presence, Individual challenges, Course Challenges, Technological challenges, Assessment and supervision, Socio economic challenges and Pedagogical challenges constructs in public and private sector regarding online challenges students faced

Table No 4.5

Challenges	**Sector**	**N**	**Mean**	***SD***	***T***	***df***	**Sig**
Learning Platforms	Public	295	4.09	.95	1.947	504	.05
	Private	210	3.91	1.11			
Contextual Challenges	Public	295	4.10	.90	2.029	504	.043
	Private	210	3.92	1.11			
Individual challenges	Public	295	1.96	.91	-2.044	504	.041
	Private	210	2.15	1.08			
Course challenges	Public	295	1.97	.92	-1.955	504	.05
	Private	210	2.15	1.10			
Technological challenges	Public	295	1.79	.98	-2.025	504	.043
	Private	210	1.99	1.13			
Assessment and supervision challenges	Public	295	1.90	.93	-1.770	504	.077
	Private	210	2.05	1.07			
Socio-economic Challenges	Public	295	1.88	.97	-1.287	504	.199
	Private	210	2.00	1.11			
Pedagogical challenges	Public	295	2.0	.90	-1.458	504	.146
	Private	210	2.15	1.11			

p<.05

Table no 4.5 shows differences among Learning Platforms , Contextual Challenges, Individual challenges, Course Challenges, Technological challenges, Assessment and supervision, Socio economic challenges and Pedagogical challenges constructs regarding

online challenges students face in public and private universities. This table shows that there is no difference in students' responses on the challenges of assessment & supervision, socio-economic challenges and pedagogical challenges because *p* value is greater than .05, while there is a difference in responses of public and private universities students in Learning Platforms, contextual challenges, individual challenges, course challenges and technological challenges *as p* value is equal or less than 0.5.

Moreover, students of both public and private universities were facing higher level of Learning Platforms challenges (Public: M=4.09 & Private: M=3.91) and contextual challenges (Public: M=4.10 & Private: M=3.92). Furthermore, public sector universities were facing more challenges as compared to private sector universities in Learning Platforms challenges and contextual challenges.

Furthermore, significant difference was found in the individual challenges, course challenges and technological challenges regarding online learning among students of public and private universities.

Objective No 4: To compare the available opportunities for students during online learning in public and private universities.

Ho3: There is no significant difference in opportunities availed by students during online learning in public and private universities.

Table No 4.6

Difference between Research Innovation, Technological Innovation and Socio economics Intervention constructs regarding online learning opportunities availed by students

Opportunities	Sector	N	Mean	*SD*	*t*	*df*	Sig
Research Innovations	Public	295	2.17	1.07	-2.0	504	.03
	Private	210	2.00	.90			
Socio economic intervention	Public	295	2.10	1.08	-1.5	504	.03
	Private	210	1.94	.93			
Technological Innovations	Public	295	2.10	1.12	-1.6	504	.09
	Private	210	2.17	1.07			

P<.05

Table no 4.6 shows the difference between Research Innovation, Technological Innovation and Socio economics Intervention constructs regarding online learning opportunities availed by students. This table shows that there is a significant difference in the available opportunities of research innovations and socio-economic interventions as p value is equal or less than .05. Additionally, no significance difference was found in the socio economic intervention as p value was greater than .05.

4.5.2 Faculty challenges and opportunities

Objective No 5: To identify the challenges faced by faculty during students' online learning in public and private universities.

Question: What are the challenges faced by faculty of public and private universities during students' online learning?

Table 4.7

Challenges faced by faculty during students' online learning in public and private universities

Challenges	Public University Faculty	Private University Faculty
	Mean (Remarks)	Mean (Remarks)
Learning Environment	4.17 (Agree)	4.16 (Agree)
Individual Challenges	2.04 (Disagree)	2.01 (Disagree)
Course Challenges	2.10 ((Disagree)	2.03 (Disagree)
Technological Challenges	2.02 ((Disagree)	2.01 (Disagree)
Assessment & Supervision	2.04 ((Disagree)	2.01 (Disagree)
Socio-economic Challenges	1.88 ((Disagree)	2.10 (Disagree)
Pedagogical Challenges	2.02 ((Disagree)	2.01 (Disagree)
Contextual Challenges	2.02 ((Disagree)	2.01 (Disagree)

Table 4.7 shows challenges faced by faculty of public and private universities during students' online learning. Results of mean value shows that faculty faced learning Platforms challenges as the main challenge during students' online learning in both public and private universities (Public: M=4.17 & Private: M=4.16). Moreover, majority of faculty responses disagreed about the contextual challenges, individual challenges, course challenges, technological challenges, assessment & supervision, socio economic challenges and pedagogical challenges regarding students' online learning in public and private universities.

Objective No 6: To explore the opportunities available for faculty during online learning at university.

Question: What opportunities are available for faculty of public and private universities during students' online learning?

Table 4.8

Opportunities available for faculty during online classes

Opportunities	Public University Faculty	Private University Faculty
	Mean (Remarks)	Mean(Remarks)
Research Innovations	3.9(Agree)	2.0(Disagree)
Technological Innovations	4.0(Agree)	3.0(Disagree)
Socio-economic interventions	4.0(Agree)	3.5(Agree)

Table 4.8 shows opportunities available for faculty during students' online learning in public and private universities. Results of the mean value showed that majority of the faculty of public sector universities were agreed about the available opportunities of research innovations (M=3.9), technological innovations (M=4.05) and socio-economic interventions (M=4.0) regarding students' online learning. Moreover, majority of private sector university faculty were agreed about the available opportunities of socio-economic interventions (M=3.5), neutral about technological innovations (M=3.06) and disagreed about research innovations (M=2.0) regarding students' online learning.

Table No 4.9

Objective No. 7 To compare the challenges faced by faculty during students' online learning in public and private universities

Ho_2: There is no significant difference in challenges faced by faculty during students' online learning in public and private universities.

Differences among Learning Platforms , Individual challenges, contextual challenges, Course Challenges, Technological challenges, Assessment and supervision, Socio economic challenges and Pedagogical challenges constructs regarding online changes faced by faculty during students online learning.

Table No 4.9

Challenges	**Sector**	**N**	**Mean**	***SD***	***t***	***df***	**Sig**
Learning Platforms	Public	179	4.17	.95	2.6	322	.07
	Private	144	4.16	.91			
Contextual Challenges	Public	179	2.02	1.90	2.5	322	.06
	Private	144	2.01	.25			
Individual challenges	Public	179	2.04	.91	2.0	322	.04
	Private	144	2.01	1.19			
Technological	Public	179	2.02	.98	.29	322	.06
challenges	Private	144	2.01	1.22			
Socio-economic	Public	179	1.88	.97	.22	322	.04
Challenges	Private	144	2.10	1.19			
Course Challenges	Public	179	2.01	1.32	.27	322	.03
	Private	144	2.03	.98			
Assessment and	Public	179	2.04	.93	.29	322	.22
supervision challenges	Private	144	2.01	1.11			
Pedagogical challenges	Public	179	2.02	.90	.27	322	.03
	Private	144	2.01	1.20			

P<.05

Table no 4.9 shows differences among Learning Platforms , Contextual Challenges, Individual challenges, Course Challenges, Technological challenges, Assessment and supervision, Socio economic challenges and Pedagogical challenges constructs regarding online challenges students face in public and private universities This table shows that there is no difference in faculty's responses on the challenges of Learning Platforms , Contextual Challenges, Technological challenges and Assessment & supervision, because *p* value of is greater than 0.5.

Whereas there is a difference in responses of public and private universities faculty in Individual challenges, course challenges, socio economic challenges and pedagogical challenges *as p* value is equal or less than 0.5.

Objective No 8: To compare the available opportunities for faculty during students' online learning in public and private universities

Ho_4: There is no significant difference in available opportunities for faculty during students' online universities, both public and private.

Table No 4.10

Difference between research innovation, technological innovation and Socio-economic intervention constructs regarding online challenges faced by faculty

P<.05

Opportunities	**Sector**	**N**	**Mean**	***SD***	***t***	***df***	**Sig**
Research Innovations	Public	179	3.9	.98	15.0	322	.00
	Private	144	2.0	1.21			
Socio economic intervention	Public	179	4.0	.98	-.16	322	.08
	Private	144	3.5	.94			
Technological Innovations	Public	179	4.05	.93	10.0	322	.00
	Private	144	3.06	.36			

P<.05

Table no 4.10 shows the difference between research innovation, technological innovation and socio-economic intervention constructs regarding online learning opportunities availed by faculty. This table revealed that faculty of public and private sector universities significantly differ on the opportunities of research innovation and technological innovations as p value is equal or less than 0.5. Whereas research innovation and technological innovations opportunities were more availed by faculty of public sector universities regarding students' online learning.

Moreover, results of mean score showed that higher level of research innovation, technological innovation and socio-economic intervention was found in faculty of both public and private universities during students' online learning.

Difference was in favor of public sector universities. While faculty of public and private sector did not significantly differ at socio economic intervention *as p* score value was greater than .05.

Table 4.11

Details of objective, hypothesis and results

Objectives	Question/Hypotheses	Results
To identify the challenges faced by students of public and private universities during online learning.	What are the challenges faced by the students of public and private universities during online learning?	The results showed that Learning Platforms and contextual challenges were the main challenges faced by students of public and private universities during online learning
To explore the opportunities available for students of public and private universities during online learning.	What opportunities are available for students of public and private universities during online learning?	Results showed that technological innovation opportunity mean score is more than other two opportunities.
To compare the challenges faced by students during online learning in public and private universities	There is no significant difference in challenges faced by students during online learning in public and private universities	There is difference in responses of public and private universities students in Learning Platforms, contextual challenges, individual challenges, course challenges, and technological challenges *as p* value is equal or less than 0.5.
To compare the available opportunities for students during online learning in public and private universities	There is no significant difference in available opportunities for students during online learning in public and private universities	There is a significant difference in the available opportunities of research innovations and socio-economic interventions as p value is less than .05.
To identify the challenges faced by faculty during students'	What are challenges faced by faculty of public and private	Results show that faculty faced Learning Platforms , course challenges, technological challenges

online learning in public and private universities	universities during students' online learning?	and contextual challenges were the main challenges faced by students during online learning.
To explore the opportunities available for faculty during students' online learning in public and private universities	What opportunities are available for faculty of public and private universities during students' online learning?	Results show that research innovation mean score is more than other opportunities.
To compare the challenges faced by faculty during students' online learning in public and private universities	There is no significant difference in challenges faced by faculty during online learning in public and private universities	There is difference in responses of public and private universities faculty in Individual challenges, Course Challenges, Socio economic challenges and Pedagogical challenges *as p* value is equal or less than 0.5.
To compare the available opportunities for faculty during students' online learning in public and private universities	There is no significant difference in available opportunities for faculty during online learning in public and private universities	Results showed that faculty of public and private sector universities significantly differ on the opportunities of research innovation and technological innovations as p value is equal or less than 0.5.

4.5 Method for Qualitative Section Analysis

For qualitative data collection, semi structured questionnaires were developed, total 10 faculty members from public sector universities and the same no of faculty members from private sector universities were interviewed as per below mentioned themes. 10 students from public sector universities and the same no of students from private sector universities also

interviewed as per given theme. The output of challenges faced by university students and faculty have been categorized under questions asked by researchers as “themes,” i.e. Learning Platforms , individual challenges, course challenges, contextual challenges, technological challenge, assessment and supervision, socio-economic challenges and pedagogical challenges. The opportunities availed by university students and faculty have been categorized under questions asked by researchers as “themes,” i.e. research innovations, technological innovations and socio-economic interventions.

4.6 Qualitative Section Thematic Analysis

In this part of chapter, analysis of the interviews from the students and faculty members of two private and two public sector universities is presented. A total 10 faculty members form public sector universities as well as same number of faculty members from private sector universities were interviewed as per below mentioned themes. A total of 10 students from public sector universities and the same number of students from private sector universities were also interviewed as per given theme.

The output of challenges faced by university students and faculty have been categorized under questions asked by researchers as “themes,” i.e. Learning platforms, individual challenges, course challenges, contextual challenges, technological challenge, assessment and supervision, socio economic challenges and pedagogical challenges. The opportunities availed by university students and faculty have been categorized under questions asked by researchers as “themes,” i.e. research innovations, technological innovations and socio-economic interventions.

The number of interviews necessary to attain saturation concentration is a topic of significant discussion for the theme and Meta theme in qualitative research. “Saturation” could

be a term that frequently comes up when we are inquisitive about qualitative research and, in specific qualitative interviews. The concept of immersion is related to the number of interviews to be conducted in qualitative research about. Interviews are one method of gathering information for a study about reach Saturation immersion. Bernard (2012) expressed the quantity of interviews necessary for a qualitative study consideration to investigate Saturation immersion was a number he may not evaluate, but that the analyst takes what he can get.

The idea of saturation immersion, also known as "Saturation method" or the moment at which no fresh themes "emerge" from saturation, is broadly referenced in thematic analysis (TA) investigate in wear and work out and past. The magnificence of qualitative research about is to discover a reply for 'WHY' & on the other hand quantitative study would needed 10 respondents in each category/sample

4.7 Qualitative Section Analysis

The study's evaluation of data authentication relied on four criteria: credibility, dependability, conformability, and transferability. To ensure the validity of the data, the researcher used a triangulation approach that involved semi-structured interviews, note-taking during interviews, and long-term engagement with the data. In addition, a sub-sample of participants was asked to review the initial findings, codes, and categories in a process called member checking, while external colleagues who were not involved in the study performed peer checking to review specific parts of the data.

To establish the dependability of the findings, an external observer who was knowledgeable about online learning and qualitative research methodology provided their opinion on the research. The external review confirmed the consistency of the results. Conformability of the findings was achieved by documenting all activities and producing a

report of the research process. Furthermore, to ensure transferability, the results were shared with two non-researcher faculty members whose situations and experiences were similar to those of the participants. The results were confirmed by these individuals as well.

4.7.1 Challenges faced by students of Public Sector Universities

Theme 1: Learning Platforms

There are numerous aspects that influence online education in contexts where students and faculty member need appropriate conditions. The process of learning is disrupted by the lack of basic necessities, noise at home, and interruptions and conversations from family members.

Sub Theme: Social Presence.

Many times it is difficult to manage online classes from home due to some social activities; guests come in class time and many other activities which are going on daily in the home environment.

Responses on social presence

- *In the home environment sometimes unexpected things occurred i.e. noises of children, pets' destruction and guests etc. It is very difficult to manage classes due to the above mentioned challenges. (Respondent no 8)*
- *My younger brother interrupts during online classes, he is too young. (Respondent no 3, 4)*

Sub Theme: Teaching presence

Students in public sector universities have noted that the teaching approach is ineffective, and as a result, they were unable to recall the key points of the lectures delivered to them.

- *I was told to take classes online, but I had no knowledge how it is to be done. At that moment not told about the platform/ mode of communication which is best to be used for online classes (Resptondent1).*

- *I was not mentally prepared to take classes online, but I don't know how to do it. Just know to send "e-mail or WhatsApp" in online learning (Resp-9).*

Theme 2 Individual challenges

There were many individual challenges faced by university students during online learning, i.e. very less support from faculty. Less motivation, conversation difficulty and time management is also the main issue faced by students and during online learning. One of them said (Rep. 7)

"The teaching team frequently uploads one-sided offline meetings in which we cannot engage actively. The professor sends out slides with a voice-over. This cannot be compared to a classroom setting where you may raise issues and answer questions. Therefore, from my perspective, students' participation and interaction are not seen, and that is a huge issue."

The other interviewee said*: Resp 7*

- *"Individual training and growth is another excellent virtual teaching strategy. I believe the percentage of engagement will rise if both parties obtain training in virtual systems since awareness always makes things better."*

Theme 3 Course challenges

Due to COVID19, lockdown was announced and many universities were not ready to start online classes and the courses designed only for face to face classes.

- *Online learning does not encourage group work, course were not alienated as per module set for online learning (Respondent 7)*
- *In my point of view the courses were not cover during the time line which is allocated (Respondent 9)*

Theme 4 Contextual challenges

Many students reported that less communication occurred faculty to students, feeling anxiety and it effect the subjective wellbeing of individual (Respondent 6, 9 and 10)

- "*I have to investigate to what extent engineering education can be delivered virtually. It might be possibleto virtualize 100% of the content in the social sciences field, but in engineering, this is not possible."*
- *"Online education is preferable regarding theoretical ideas, clinical reasoning, and other topics, but actual activities must unquestionably be carried out in person and cannot be done electronically. However, practical technical instruction should be given in person. In the case of differential discussion of complex cases, it performs far superior."*

Theme 5 technological challenge

Students mostly in BS level were not aware about the latest technology and software handling. Zoom, Google meet and MS Teams developed and added many new things and features in their application. One of the participants said (Resp. 8):

- *"Learning about engineering online undoubtedly requires quality supervision. To guarantee quality, some norms are required."*
- *"If we are worried about the calibre of education, we should pay attention to the infrastructure. Considering the web's speed, we are unable to download a*

documentary. No one was able to download a movie that one of the teachers posted." (Resp. 10)

Theme 6 assessment and supervision

Students of public sector universities need institutional help for successful online learning and assessment. Institutions need to train about the assessment process, the online examination created many problems for the students.

Theme 7 socio economic challenges

After the lockdown, all students in rural Pakistan moved back to their home towns, where the socioeconomic system was poor and there were many issues for the pupils. The internet was quite expensive, and the services were really subpar. Students in public sector universities who are primarily from rural areas like GB, Chitral, Ex-FATA, interior Sindh, and south Punjab, among others, lack access to good internet and mobile network infrastructure.

- *The resources are not so adequate therefore it is difficult to learning online, mostly students facing financial issue (Respondent 6)*

Theme 8 pedagogical challenges

The learning management system (LMS) which were created by universities during lockdown and after smart lock down when classes were online was not good and the content was unorganized. Curriculum design and framework was not adequate.

- *At that time I knew about the modules because used it when I was doing online course (Respondent 2).*
- *I know how to use Google meet and don't face any problem while teaching online at any stage (Respondent 8)*

4.7.2 Challenges Faced by Students of Private Sector Universities

Theme 1 Learning Platforms

The various factors that affect online learning in a home environment where students and faculty need proper settings. Due to lack of basic needs, home distraction and interruption from family members the process of learning and teaching disturbed. Private sector universities have less resources and also financial constraints due to COVID-19 and the lockdown issue. All the expenditures and salaries and other management costs of private sector universities come from student fees, which were not paid by students in that situation.

Social Presence.

Sometimes it is difficult to manage online classes from home due to some social activities, guests coming to class in a timely manner and other activities which are going on daily in the home environment.

Responses on social presence

- *In the home environment sometimes unexpected things like guests etc come at class time. It is very difficult to manage classes due to the above mentioned challenges. (Respondent 8 and 1)*

Teaching presence

Students in private sector universities highlighted that the way of learning is not appropriate, due to this, they were not able to pick the main points of their lectures which were delivered by faculty members.

- *I was asked to learn online, but without providing any training on how it is to be done, which software to be used (At early time of COVID 19). (Respondent 2, 6 and 9).*

Theme 2 Individual challenges

Private university students reported that they had various unique difficulties while learning online, including a lack of faculty support. Less motivation, trouble starting conversations, and time management are other major problems, that students encounter when learning online.

- *"The fact that this curriculum doesn't demand actual presence makes me really happy. That, in my opinion, is the main benefit of online learning. Being able to study in my own room, and take breaks whenever I want to spend time with my kids, makes me happy as well. I'll be able to balance my family life and my studies better this way."* (Resp10)

Theme 3 Course challenges

Due to COVID-19, when lockdown was announced, many universities were not ready to start online classes, and the courses were designed only for face to face classes.

- *Online learning discourage group work, course were not alienated as per module set for online learning (Respondent 5 and 8)*
- *The duration of interaction between students and faculty were very short that's* why courses not covered properly (Respondent 6 and *3)*

Theme 4 Contextual challenges

Many students reported that less communication from faculty to students, feeling anxiety and it effect the subjective wellbeing of individual (Respondent no 6, 9, 1 and 8)

- "I feel alone since I don't know any of my other students well, and lack the courage to call them and ask whether they experience the same anxiety as me. I wouldn't even dare to call my teacher. I have to view everything from a distance because of the very nature of distance learning."(Resp8)

Theme 5 Technological challenge

Students mostly in BS level were not aware about the latest technology and software handling. Zoom, Google meet and MS Teams developed and added many new things and features in their application.

- *I am using Google classroom, but connectivity keeps on loosing (Respondent 2, 3 and 6).*
- *I don't have a laptop at home, it's difficult to take online classes and also don't know how to use internet (Respondent 1, 4 and 7).*
- *"One of the issues with online learning was the sluggish internet speed. Things have become challenging due to the poor pace of downloading instructional videos and lectures, since some files are so big that they take a while to download."*

Theme 6 assessment and supervision

Students of public sector universities need institutional help for successful online learning and assessment. Institutions need to trained about the assessment process, the online examination created many problems for the students.

- *There are numerous online tasks, and it might be challenging to check them all. Since I don't have a printer in my house, I want to make copies of the results and evaluate them, but I can't (Respondent-2, 3 and 10).*
- *Due to inadequate bandwidth, I was unable to download huge files from the internet (Respondent-5, 7 and 9).*
- "We ought to put students in the corridors with social distance for summative examinations and administer live assessments while recording them. Cheating in exams

is another syndrome that exists in this situation. The student arranges for a substitute to take the test. The plot is really convoluted.*"*

Theme 7 socio economic challenges

In remote areas of Pakistan after lockdown, all students shifted to their native villages where the socio economic system is not well and created many problems for students. The cost of the internet was very high and the services were very poor. Public sector universities students mostly belong to remote areas like GB, Chitral, Ex FATA, interior Sindh and south Punjab etc. did not have reliable facilities of internet and mobile network.

- *Students can understand the concepts with already existing material online on various free websites, paid reading martials available there (Respondent-2).*
- *Our faculty using blackboard as a LMS for some courses online, so it's similar to teaching from home. I don't find much difference and feel the same (Respondent-1, 3 5 and 9).*

Theme 8 pedagogical challenges

The learning management system (LMS) which were created by universities during lockdown and after smart lock down when classes were online were not extraordinary in their performance and the content was unorganized. Curriculum design and framework was not adequate.

- *I feel that online learning is just waste of time , as no effectiveness takes place (Respondent 3, 6 and 7)*
- *Because of lack of resources and facilities, online learning is adversely affected. I don't feel like learning anymore (Respondent 9).*

Table. 4.7.3

Comparison Challenges Faced by Students of Public and Private University Students

Challenges	**Public Universities Students Responses**	**Private Universities Students Responses**
Theme-1 Learning Platforms	3	2
SubTheme1: Social presence SubTheme2:Cognitive presence	2	1
Sub Theme3: Teaching presence Theme-2	3	4
Individual Challenges Theme-3	2	4
Course Challenges Theme-4	3	5
Technological Challenges Theme-5	7	6
Assessment and Supervision Theme-6	4	7
Socioeconomic Challenges Theme-7	3	4
Contextual Challenges Theme-8	6	3
Pedagogical Challenges	3	4
	2	3

The no of responses shows that in public sector universities individual challenges is the most common challenge faced by public sector university students during online learning. In private

sector universities course challenges is the most common challenge faced by students during online learning.

4.7.4 Challenges faced by faculty of Public Sector Universities

Theme 1 Learning Platforms

Enormous factors affect online learning in home environments where faculty members need proper settings. Due to non-availability of basic needs, disturbance at home, interruption, and conversation from family members affect the process of learning.

Social Presence.

Many times it is difficult to manage online classes from home due to some social activities, guests come during class time, and many other activities happen that are going on daily basis in the home environment.

Responses on social presence

- *In the home environment sometimes unexpected things occurred i.e. noises of children, pets' destruction and guests etc. It is very difficult to manage classes due to the above mentioned challenges. (Respondent 2 and 8)*

- *My nephew interrupted during online classes, he is too young. (Respondent 3 and 10*)

Teaching presence

Faculty members in public sector universities highlighted that the method of teaching is not appropriate, as a result, they couldn't pick the main points of their lectures which were delivered by faculty members.

- *All the required and best online modes are expensive, Zoom is open-source and illegal software that I'm employing, but it comes with time and user limits (Respondent 9).*

- *I use LMS provided by my institution, therefore proper training provided by institution (Respondent 3).*

Theme 2 Individual challenges

There were many individual challenges faced by university faculty during online learning, i.e., students stating very less support from faculty. Less motivation, conversation difficulty and time management were some of the main issue faced by students and during online learning.

- *I probably would have never imagined it if someone had told me at the start of the online classes, that I wouldn't have developed close bonds with a few of my students. Contrary to popular belief, I believe that the relationships I have built inside the confines of this virtual program are stronger than any I have ever had in my face-to-face sessions.*

Theme 3 Course challenges

Due to COVID-19, when lockdown was announced, many universities were not ready to start online classes, and the courses designed only for face to face classes. The courses were not designed for online classes, so it created confusion for faulty members who they teach effectively.

- *Online teaching not good for grouping students and assigning group assignments, course were not alienated as per module set for online teaching (Respondent 7 and2)*
- *In my point of view, the courses were not covered during the timeline, which is allocated in the semester (Respondent 6)*

Theme 4 Contextual challenges

Many faculty member of public sector universities reported that less communication was seen from faculty to students, feeling anxiety and it effected the subjective wellbeing of individuals (Respondent 6, 9, 10 and 1)

- *"*Due to the fact that the technical courses have a 3-dimensional mode and require more explanation, I believe we have something wrong. I am unable to accomplish it remotely.*"*

Theme 5 technological challenge

Most of the faculty members are not aware about the latest technology and software handling. Zoom, Google meet and MS Teams developed and added many new things and features in their application. Institutions did not provide proper training on how to handle new software and technology.

Theme 6 Assessment and Supervision

Universities in the public sector require institutional support to improve online learning and evaluation. Institutions must educate themselves on the evaluation procedure, because the faculty had several issues with the online exam. In online testing, there is a chance of cheating and plagiarism. The majority of the faculty members who were interviewed were unsatisfied since they were unable to properly supervise their students, which is another major issue.

- *While the teacher explained a problem in a face-to-face class, it was easier to communicate with the other students or the faculty and ask them questions in order to understand the material fully. Although these inquiries and responses have improved learning, we need helpful online educational environments." (Resp 2)*

Theme 7 Socio Economic Challenges

In remote areas of Pakistan after the lockdown, most of the students and faculty members shifted to their native villages, where the socio economic system is not well and created many problems for students and faculty members. The cost of the internet was very high and the services were very poor.

- *I feel that online teaching is only waste of time and resources, as no effective and good result seem to be obtained from it (Respondent 3).*
- *Due of non-availability of required resources and facilities, online teaching negative impact on students and faculty (Respondent 9).*

Theme 8 pedagogical challenges

The learning management system (LMS) which were created by universities during lockdown and after smart lock down, when classes were online was not good, and the content was unorganized. Curriculum design and framework was also inadequate.

- *I have good command of the mode of online learning, because I was using it in the regular teaching (Respondent 2).*
- *I am very good using Google meet and I do not facing any problem to using the software (Respondent 4).*
- *Teaching remotely suffers as a result of a lack of amenities and assets. I no longer have the desire to teach (Respondent 5)*

4.7.5 Challenges faced by faculty of Private Sector universities

Theme 1 Learning Platforms

The different elements that influence online education and instruction in a situation where students and faculty need appropriate conditions. The educational process was disrupted as a result of a lack of necessities, domestic distractions, and family interruptions.

Social presence

Due to the various social events, visitors that arrive during class, and several other activities that take place every day in the home environment, managing online lessons from home can often be challenging.

Responses on social presence

- *In the home environment, sometimes unexpected things occur i.e. noises of children, pets' destruction and guests etc. It is very difficult to manage classes due to the above mentioned challenges. (Respondent 5,1, 3 and 7)*
- *My daughters and nephew interrupt during online classes, he is too young. (Respondent 4,8 and 5)*

Teaching presence

Faculty members in private sector universities highlighted that the method of teaching is not appropriate, due to this, they did not pick the main points of their lectures which were delivered by faculty members.

- *All the available online mode are good, I used open software Zoom, at that time when all the service providers were upgrading softwares,, so very limited access and no of users were allowed (Resp-7).*
- *My institution provided me LMS, but did not provide proper training, that why ,it was difficult for me to use it (Resp-3).*

Theme 2 Individual challenges

When teaching online, private sector university faculty members faced a variety of unique difficulties, including the fact that students reported receiving little help from their professors. Less motivation, trouble starting conversations, and time management are other major problems that students encounter when learning online.

- *My university has encouraged me to use Zoom open software which is open-source, needs to put details and has privacy issues which is not good for me (Respondent 4, 1, 5 and 9).*
- *During online learning MS Teams and licenses obtained by the university mean that I don't see any security risks, thus everything is OK in my book (Respondent 5)*

Theme 3 Course challenges

Due to COVID-19 when lockdown was announced many universities were not ready to start online classes, and the courses were designed only for face to face classes.

- *Online teaching does not encourage group work, course were not alienated as per module set for online learning (Respondent no 1, 3, 4 and10)*
- *In my point of view, the courses are covered during the time line which is allocated (Respondent 7, 5, and 9)*

Theme 4 Contextual challenges

Many faculty reported that responses from students to faculty, feeling anxiety and it effects the subjective wellbeing of individual (Respondent no 6, 9 and 1)

- *I comprehend each sentence and term in the online course the professor emailed us, but I have no idea how to apply the directions to create the programming. Because I don't know precisely what the teaching staff expects, I always include a note with my*

*assignment asking her to "please let me understand whether I need to do more" to ensure that I complete everything I am required to. (*Resp6*)*

Theme 5 technological challenge

Private sector university faculty members did not use paid teaching software; instead, they used free software, which caused disruptions while teaching online. Most BS-level students were ignorant on how to handle modern software and technologies. The applications from Zoom, Google Meet, and Microsoft Teams have all undergone extensive development and feature additions.

Theme 6 assessment and supervision

Faculty members of private sector universities required institutional help for successful online learning and assessment. Institutions need to train about the assessment process, the online examination created many problems for the students.

- *Students are not so good, they used copy paste and when assessment is done in online learning, it is not so effective for learning and assessment process (Respondent 4, 5, 9 and 10).*
- *It is quite challenging to create questions with an excessive taxonomy level, for pupils are unable to respond, even with the use of an open book. Few teachers are capable of creating these queries.*

Theme 7 socio economic challenges

After the lockdown, all students in rural Pakistan moved back to their home towns, where the socio economic system was poor and there were many issues for the pupils. The internet was quite expensive, and the services were really troublesome. Students attending private

universities who are primarily from rural areas, such as GB, Chitral, the former FATA, interior Sindh, and south Punjab, lack access to strong internet and mobile network infrastructure.

- *My observation was that the teaching method using online platforms are not so effective, the output are not so good (Respondent 3, 8, 9 and 10).*
- *One of the important another syndrome which we are facing is the inadequate access and availability of resources and facilities, online teaching is adversely affected. My feeling is negative about online teaching (Respondent-1, 4 and 9).*

Theme 8 pedagogical challenges

The learning management system (LMS) which was created by universities during lockdown and after smart lock down, when classes were online was not good and the content was unorganized. Curriculum design and framework were not adequate.

- *Because I used Moodle for my regular teaching, I am an expert in it (Respondent-1, 3 and 2).*
- *I feel ease at utilizing Google Meet and encounter no issues whenever teaching online. (Respondent-3, 5 7 and 9)*
- *Teaching remotely suffers as a result of a lack of facilities and resources. I no longer have the desire to teach (*Respondent-10 and 9*)*

Table 4.7.6

Comparison Challenges faced by faculty of public and private university students

Challenges	Public Universities Faculty Responses	Private Universities Faculty Responses
Theme-1 Learning Platforms	4	3
Sub Theme1: Social presence	3	4
Sub Theme2: Cognitive presence	5	3
Sub Theme3: Teaching presence	4	2
Theme-2 Individual Challenges	4	2
Theme-3 Course Challenges	4	3
Theme-4 Technological Challenges	7	8
Theme-5 Assessment and Supervision	4	2
Theme-6 Socioeconomic Challenges	3	5
Theme-7 Contextual Challenges	3	4
Theme-8 Pedagogical Challenges	2	2

The no of responses shows that in public sector universities technological challenges are the most common challenge faced by public sector university faculty members during student's online learning. In private sector universities faculty were also faced technological challenges during student's online learning.

4.7.7 Opportunities Availed by Students of Public Sector Universities

Theme1 Research Innovations,

The innovation in research emerged after the COVID19 incident, when universities began developing online teaching and learning modules and the learning management system (LMS). Learning procedure were redesigned. It generated fresh concepts for investigation and invention.

- *"It falls under the pre-corona and post-corona categories. Before Corona, the academics' computer literacy level may be about 10%, but after Corona, they were compelled to learn. Most of my coworkers are acquainted with one technique for creating electronic content (Resp 8)*

Theme 2 technological innovations

Technology was innovated, thanks to online learning; numerous software developers added new features to their modules. One of the interviewees explained this as follows

- *"In any event, Corona introduced this strategy to coworkers. We picked up some new software. I was also made to use virtual software. The institution, but Corona made us implement it."*

Theme3 socio-economic interventions

Students now have greater freedom to do their coursework, thanks to online education. Lower commuting costs, flexible class scheduling, and the availability of more educational materials.

4.7.8 Opportunities by Students of Private Sector Universities

Theme1 Research Innovations,

After COVID 19 the idea of new research emerged, and several software development companies started working on it after creating spaces for research. When online classes first started very few universities in Pakistan were implementing online learning and teaching.

Theme 2 Technological Innovations

Technology was innovated, thanks to online learning; numerous software developers added new features to their modules. New applications for hybrid classes and meetings have

been created by Zoom, Google Meet, MS Teams, and many other large software businesses to handle official gatherings.

Theme3 Socio-Economic Interventions

Students now have greater freedom to do their coursework thanks to online education. Lower commuting costs, flexible class scheduling, and the availability of more educational materials.

Table No. 4.7.9

Comparison Opportunities Availed Students of Public and Private University Students

Opportunities	Public Universities Students Responses	Private Universities Students Responses
Theme-1 Research Innovation	6	5
Theme-2 Technological Innovation	8	9
Theme-3 Socioeconomic intervention	4	7

The no of responses shows that in public sector universities, technological innovation is the most common opportunity availed by public sector university students during online learning, and also same responses received from private sector universities students.

4.7.10 Opportunities Availed by Faculty of Public Sector Universities

Theme1 Research Innovations,

Because public sector institutions began offering online teaching and learning modules and established the learning management system (LMS) with HEC's assistance, faculty members there have greater opportunities. It fostered innovation in online research and learning. Redesigned learning procedures. It generated fresh concepts for investigation and invention.

- *"Nevertheless, Corona introduced coworkers to this methodology. We acquired some new software. I felt compelled to use digital programs as well. Well, the university already had this policy, but Corona forced us to implement it."*

Theme 2 Technological Innovations

Technology was innovated, thanks to online learning; numerous software developers added new features to their modules. New applications for hybrid classes and meetings have been created by Zoom, Google Meet, MS Teams, and many other large software businesses to handle official gatherings.

- *"Individual training and growth is another excellent virtual teaching strategy. I believe the percentage of engagement will rise if both parties obtain training in virtual systems since awareness always makes things better." (Resp. 7)*

Theme3 Socio-Economic Interventions

Students now have greater freedom to do their coursework, thanks to online education. Lower commuting costs, flexible class scheduling, and the availability of more educational materials.

"In order to prevent students from feeling alienated, online learning should be promoted. Students stop studying and will only review lessons at the end of the semester if they are informed that there will be an exam covering these 20 subject areas at the conclusion of the term."

4.7.11 Opportunities Availed by Faculty of Private Sector Universities

Theme1 Research Innovations,

After COVID-19 situation when universities started online teaching and learning modules and developed the learning management system (LMS) the innovation came in research. The learning processes redesigned. It created new ideas for research and innovation.

- *"It's a terrific opportunity to learn online. Education must now be verified. So that others can view it, the lecturer presents it virtually. It won't go away. It will be recorded if you upload a PowerPoint presentation, voice recording, or other items. Before, this situation didn't exist."*

Another said: (Resp 8)

- *"We may now have the lecturers' remarks and teachings record, thanks to the advent of online learning, unlike in the past. This has made it possible for me to study and play it again in order to properly analyze and comprehend it. I believe it enabled me to study more deeply."*

Theme 2 Technological Innovations

Online learning created innovation in technology, many software companies developed their modules and created new features. Zoom, Google Meet, MS teams and many other big software companies developed new applications for hybrid classes and meetings for dealing with official meetings.

One of them said (Resp. 6):

- *"The faculty is unfamiliar with the technological advances among the more seasoned members. For instance, they will seek assistance if requested to install software on their personal computer. As a result, high-tech professors have greater success."*

Theme3 Socio-Economic Interventions

Online teaching and learning created more liberty to students for completion of their studies. The transportation expenses reduced, flexible scheduling of classes, eventually leading to provision of more learning resources.

- "During the time I was requested to offer lessons digitally, I first opposed strongly because I thought that online learning couldn't possibly be an acceptable substitute for conventional classes. I discovered after a few sessions that I can also achieve good results with online learning after utilizing various applications, analyzing students' actions, and participating in certain sessions."

Table No. 4.7.12

Comparison Opportunities Availed Faculty of Public and Private University Students

Opportunities	Public Universities Faculty Responses	Private Universities Faculty Responses
Theme-1 Research Innovation	8	7
Theme-2 Technological Innovation	7	8
Theme-3 Socioeconomic intervention	3	5

The no of responses show that in public sector universities research, innovations are the most common opportunity availed by public sector university faculty during students online learning. The no of responses show that in private sector universities technological innovation are the most common opportunity availed by private sector university faculty during students online learning

Table No. 4.7.12

Comparison between Public and Private Universities

Public	Private

	Students	**Faculty**	**Students**	**Faculty**
Quantitative				
Challenges	Learning Platforms Contextual	Learning Platforms	Learning Platforms Contextual	Learning Platforms
Opportunities	Research Innovations, Technological Innovation Socio-economic (Not Available)	Research Innovations Technological Innovations Socio-economic (Available)	Research Innovations Technological Innovations Socio-economic (Not Available)	Socio-economic Interventions (Available)
Qualitative				
Challenges	Technological and Individual Challenges	Technological	Technological and Individual Challenges	Technological
Opportunities (Available)	Technological Innovations	Technological Innovations and Research Innovations	Technological Innovations	Technological Innovations and Research Innovations

CHAPTER 5

SUMMARY, FINDING, DISCUSSION, CONCLUSION AND RECOMENDATIONS

5.1 Summary

The main aim of the current study was to compare the challenges and opportunities regarding online learning in public and private universities.

In accordance with the goals of the study, the researcher also produced four hypotheses. The study's conceptual framework was based on four past studies on online learning. The framework contained eight components of challenges and three components for opportunities regarding online learning. The research was based on mixed methods so both quantitative and quantitative approach applied here. The quantitative method was used to categories the collecting of numerical data or information that may be transformed into useful statistics. For qualitative approach semi structured questionnaire used for interview both students and faculty member of both private and public sector universities in in Islamabad. The total sample size of students for both universities was based on 505 from the social sciences and engineering department. The total sample size of faculty for both universities was based on 323 from social sciences and engineering department. The study utilized a stratified proportional sampling approach to select the sample for investigation. A self-developed questionnaire was utilized to collect data from both faculty and students at public and private universities. To ensure the validity of the instrument, three professionals in the field of education were consulted. Their insightful feedback was considered to enhance the tool.

Additionally, the reliability of the instrument was assessed through pilot testing conducted by the researcher. The collected data was analyzed using independent T-Test analysis. Finally, the researcher assessed the results and provided recommendations based on the findings. One hundred sixty respondents were selected for pilot testing 90 student respondents and 70 faculty members from Public sector universities and 70 students and 40 faculty members from private sector universities. The tool was refined subsequent to the analysis of pilot testing results.

In addition, a demographic section was incorporated into the questionnaire to obtain more information about the respondents. The study was conducted amidst the COVID-19 pandemic in Pakistan, necessitating the use of online data collection methods. To collect data, the researcher distributed the questionnaire to male and female students in private and public universities in Islamabad via a Google Sheet link. The collected data was analyzed using SPSS 21, with statistical tests such as Cronbach's alpha, item total correlation, inter-section correlation, mean score, and independent T-test. Based on the findings, the researcher evaluated the results and provided recommendations.

For the qualitative section total 10 faculty members from public sector universities as well as same number of faculty members from private sector universities were interviewed as per addressed themes. A total of 10 students from public sector universities and the same number of students from private sector universities were also interviewed as per the given themes. Thematic analysis was used for qualitative data analysis.

5.2 Findings

5.2.1 Quantitative Section Findings

1. It was found that students of public and private universities were agreed that they faced learning Platforms (Public: M=4.09, Private: M=3.91) and contextual challenges (Public: M=4.10, Private: M=3.92). (Table 4.3).
2. It was found that students of both public and private universities showed disagreed attitude towards available opportunities of technological innovation (Public: M=2.10, Private: M=2.17), research innovations (Public: M=2.17, Private: M=2.00) and socio-economic intervention (Public: M=2.10, Private: M=1.94). (Table 4.4).
3. It was found that there is a significance difference in responses of public and private universities students in learning platforms, challenges, contextual challenges, individual challenges, course challenges and technological challenges *as p* value is equal or less than 0.5. Moreover, students of both public and private universities were facing higher level of learning platforms challenges and contextual challenges. Furthermore, results also showed that public sector universities were facing more challenges as compared to private sector universities in learning platforms challenge and contextual challenges. (Table 4.5).
4. It was found that there is a significant difference in the available opportunities of research innovations and socio-economic interventions as p value is less than .05. Moreover, intensity/ level of available opportunities to students regarding online learning was low. (Table 4.6).
5. It was found that faculty faced Learning Platforms challenges as main challenge during students' online learning in both public and private universities (Public: M=4.17

& Private: M=4.16). Moreover, majority of faculty responded disagreed about contextual challenges, individual challenges, course challenges, technological challenges, assessment & supervision, socio economic challenges and pedagogical challenges regarding students' online learning in public and private universities. (Table 4.7).

6. Results show that majority of the faculty of public sector universities were agreed about the available opportunities of research innovations (M=3.9), technological innovations (M=4.05) and socio-economic interventions (M=4.0) regarding students' online learning. Moreover, majority of private sector university faculty were agreed about the available opportunities of socio-economic interventions (M=3.5), neutral about technological innovations (M=3.06) and disagreed about research innovations (M=2.0) regarding students' online learning. (Table 4.8)
7. It was found that there is a difference in responses of public and private universities faculty regarding students online learning in Individual challenges, course challenges, socio economic challenges and pedagogical challenges *as p* value is equal or less than 0.5. However, level/ intensity of these challenges faced by faculty regarding students' online learning was low in both public and private universities. (Table 4.9).
8. It was found that during students' online learning, faculty of public and private sector universities significantly differ on the opportunities of research innovation and technological innovations as p value is equal or less than 0.5. Whereas research innovation and technological innovations opportunities were more availed by faculty of public sector universities regarding students' online learning. (Table 4.10).

5.2.2 Qualitative Part Findings

Challenges faced by Students in Public Sector Universities

Students from public sector universities encounter numerous difficulties during online learning, including improper classroom settings, internet problems, a lack of devices, technological problems, and problems with the course material caused by a absence of rudimentary necessities, home distractions, and disruptions from family members and visitors. The majority of students at public universities offered response varying in length and detail about the aforementioned problem.

5.2.2.1 Challenges faced by Students in Private Sector Universities

Due to COVID19 and the lockdown issue, private sector universities had fewer resources and budgetary restrictions. Private sector institutions' whole budget, staff wages, and other administrative costs are covered by unpaid tuition. According to those interviewed, students at private institutions suffered significantly more during COVID-19 than students at public universities.

5.2.2.2 Challenges faced by Faculty in Public Sector Universities

Public sector university professors emphasized that teaching style is natural and that online learning was not practical for the course material. The teaching atmosphere was unworkable, the equipment was outdated, the faculty members did not receive the proper training, and the assessment and supervision of tests was improper.

5.2.2.3 Challenges faced by Faculty in Private Sector Universities

Public sector university faculty members emphasized how improper the teaching approach is. They did not choose the major points of the lecture that their professors gave as a

result. The teaching and learning processes are hampered by the fact that faculty members at private sector institutions lack paid software for instruction, institutional and technical assistance, and financial problems because they are not paid by the university administration.

5.2.3 Opportunities

Opportunities Availed by Students in Public and Private Sector Universities

Innovation in research emerged after COVID19, when universities launched online teaching and learning modules and created the learning management system (LMS). The methods for learning were revised. It generated fresh concepts for investigation and invention. Following interviews, university students from the public and private sectors shared the same views on socioeconomic intervention, technical innovation, and research innovation. Students are now more accustomed to using new software, programs, and IT hardware.

Opportunities Availed by Faculty in Public and Private Sector Universities

Because public sector institutions began offering online teaching and learning modules and established the learning management system (LMS) with HEC's assistance, faculty members there have greater opportunities. It fostered innovation in online research and learning. The methods for learning were revised accordingly leading to the development of fresh concepts for investigation and invention. However, when we compare the options available to public sector institutions with private sector universities, the outcomes were not outstanding and satisfactory, and HEC does not support this. Open online apps were being used by academics, staff, and students for teaching and learning.

5.3 Comparative Findings of Public and Private Universities

According to the interviewed and thematic analysis above mentioned students from private sector universities faced challenges related to technology, assessment and supervision,

contextual, but in public sector universities the facilities of technology and the module of courses and assessment and supervision were slightly good. Students of private sector universities faced challenges related to their equipment, lack of technical assistance, not having proper assessment and supervision system. The module and contextual things were better as compared to public sector universities.

5.4 Discussion

The primary goal of the study was to compare the challenges faced by students and faculty and opportunities availed by both among public and private universities This research, which involved staff and students from both public and private universities in Islamabad, had a main objectives to identify the main challenges and explore the availed opportunities and compare it among private and public universities. To get data from respondents, the researcher employed a self-created questionnaire. The researcher collected the data, which is shown the challenges of online learning and teaching in home environment or while working from home were significant for both students and faculty. They had some chances and were taught some manners, which are important for learning and teaching and call for more sophisticated classroom supplies such a whiteboard, pen, and printer. There are many external factors that exist in home settings that negatively impact the quality of education and learning, such as the disturbance of children and pets, visitors or guests, music, family obstacles, and family work. It is important to create a suitable environment, free from outside distractions and upsetting family influences.

Ala-Mutka et al. (2008) proposed that addressing digital competence as an emergency remote teaching issue could be achieved by incorporating it into the teaching and learning process of all subjects, rather than designing a separate platform for learning digital skills.

Similarly, Omotayo and Haliru (2020) emphasized the importance of motivating learners to acquire digital competency in order to remain relevant in the modern world. Both studies highlight the need for a comprehensive approach to addressing digital competence in education, as it is crucial for successful remote teaching and for preparing learners for the demands of the digital age. The institutional online teaching and learning that provided technical training for new software was when a simple computation advanced during an investigation.

HEC provided MS Teams free of cost to faculty members and students at public universities, however the administration of the institution did not provide adequate instruction on how to use the program. Han and Ellis (2019) proposed that it should help students understand the benefits of blended discussions and also clarify the integration of online discussion and traditional face-to-face learning. Wang, Cheng, et al. (2020) highlighted the importance of sharing current research findings across various disciplines to facilitate collaborative inquiry and technological networking in developing effective preventive and control measures for the COVID-19 pandemic. Such collaboration is essential for ensuring the success of online studies. The faculty's side uploads reading materials, while the student's side uploads homework and other things. Some academic institutions created their own learning management systems (LMS). The university's IT department provided faculty and students with thorough training, and these individuals handled online classes flawlessly.

Educational technology researchers need to focus on the development of alternative assessment methods that are resistant to cheating and plagiarism, while paying attention to Feldman's recommendations for fair and equitable assessment systems, to prepare for any future pandemic, or other external disruptions that may occur in the education system (Bozkurt

& Sharma, 2020). While online education offers new opportunities for delivering and accessing educational content, assessment practices in the online environment often lack diversity and are limited in their modes of delivery (Williams, Cameron, & Morgan, 2012). The success of implementing these modalities has been demonstrated in countries such as Croatia and Serbia (Eder, R.B., 2022).

When asked about online teaching and learning, faculty reported feeling uncomfortable; some courses required face-to-face connection because of their practical or numerical components. This makes it obvious that addressing individual problems is necessary for effective online training and learning. The faculty should be motivated by having their efforts recognized with monetary and non-monetary prizes like the "best online faculty award", additional incentives for their struggle with online classes, and financial support for purchasing specialist frameworks and web offices.

5.4.1 Limitation of Present Research

1. Many attempts were made to select the desired calculated sample size through various modes of data collection. The number of returned responses which were less as compared to actual calculated sample size, was one of the limitations of present research.
2. Secondly data was also collected on the demographic variables, but it was of no use as objectives of research study does not support the demographic information.

5.5 Conclusion

It was concluded that students of both public and private universities faced learning platforms and contextual challenges as main challenges during online learning. Majority of students was of the view that individual challenge, technological, assessment and supervision

challenges, socio economic challenges, pedagogical challenges, and content challenges were not as challenges for the students. Students of both public and private universities were disagreed about available opportunities of technological innovation, research innovations and socio-economic intervention.

In comparison of public and private universities regarding challenges faced by students during online learning, significant difference was found in learning Platform challenges, contextual challenges, individual challenges, course challenges and technological challenges. Students of both public and private universities were facing higher level of learning Platform challenges and contextual challenges. Furthermore, public sector universities were facing more challenges as compared to private sector universities in learning Platforms challenges and contextual challenges. In comparison of public and private universities regarding available opportunities to students during online learning, significant difference was found in opportunities of research innovations and socio-economic interventions.

Majority of university faculty faced Learning Platforms challenges as main challenge during students' online learning in both public and private universities. Moreover, majority of public and private university faculty disagreed about contextual challenges, individual challenges, course challenges, technological challenges, assessment & supervision, socio economic challenges and pedagogical challenges regarding students' online learning in public and private universities.

It is concluded that majority of the faculty of public sector universities agreed about the available opportunities of research innovations, technological innovations and socio-economic interventions regarding students' online learning. Moreover, majority of private sector university faculty were agreed about the available opportunities of socio-economic

interventions, but showed neutral attitude about technological innovations and disagreed about research innovations regarding students' online learning. In comparison of public and public universities, there is a significant difference in responses of public and private universities faculty in individual challenges, course challenges, socio economic challenges and pedagogical challenges.

In comparison of public and public universities, faculty is significantly different in the opportunities of research innovation and technological innovations. Whereas research innovation and technological innovations opportunities were more availed by faculty of public sector universities regarding students' online learning.

Students of both public and private universities were dissatisfied with available opportunities of technological innovation, research innovations and socio-economic intervention. Students of both public and private universities were facing higher level of Learning platform challenges and contextual challenges. Furthermore, public sector universities were facing more challenges as compared to private sector universities. In comparison to public and private universities regarding available opportunities to students during online learning, significant difference was found in opportunities of research innovations and socio-economic interventions. Majority of university faculty faced Learning platforms challenges as main challenge during students' online learning in both public and private universities. In comparison to public and public universities, there is a significant difference in responses of public and private universities faculty in individual challenges, course challenges, socio economic challenges and pedagogical challenges. In comparison to public and public universities, faculty is significantly different in the opportunities of research innovation and technological innovations. Whereas research innovation and technological

innovations opportunities were more availed by faculty of public sector universities regarding students' online learning.

Students of both public and private sector universities were facing technological and individual challenges whereas technological innovation was the available opportunity to the students of both public and private sector universities. According to qualitative data analysis, faculty of both public and private sector universities were facing technological challenges whereas technological and research innovations were the available opportunities to the faculty of both public and private sector universities.

5.5 Recommendations

Recommendations in this study were based on the data and conclusion. Below are some recommendations that were made.

1. Learning platform may be improved and more facilities may be available for students to continue online learning smoothly.
2. The socio-economic conditions need to improve students at higher educational institutions along with more technological advancement and more financial support. The scholarships, students' loans and other financial support may be provided to students to continue online learning.
3. Private universities may facilitate their faculty and students to avail the opportunity of socio-economic interventions.
4. Private universities may facilitate their faculty and students to avoid contextual challenges and individual challenges.
5. Faculty of private sector universities may be strengthened for research innovations, technological innovations and socio-economic interventions.

6. University may provide training to the students regarding the use of new technologies such as new software's to facilitate the online learning in both in public sector universities.
7. University may involve students more in the research activities regarding various aspects of online learning in collaboration with faculty in both in public and private sector universities.

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QUESTIONNAIRE FOR TEACHERS

Dear Respondent,

I am a student of MPhil Education at National University of Modern Languages (NUML) Islamabad and doing my research study on the topic "**Comparative Study of Public and Private Universities Regarding Online Learning: Challenges and Opportunities"**

This questionnaire aims to highlight the challenges faced by the teachers in the university during online learning. You are kindly requested to fill out this questionnaire by following the instructions below. Your opinion will help us to get a realistic view about challenges and opportunities regarding online learning. There is no right or wrong answer, your response will be kept confidential and will only be used for research purpose.

Muhammad Aftab
MPhil Scholar
Department of Education
National University of Modern Languages Islamabad

Demographic Information

1. Name: (optional)_____
2. University: _____
3. Sector
   a. Public_____
   b. Private_____
4. Place, Residence, City_____
5. Faculty_____
6. Department: _____
7. Designation_____

Answer Scale:

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Challenges:

1. Learning platforms Challenges							
LEC1	1	Online learning causes distractions at home.	1	2	3	4	5
LEC2	2	Online learning does not allow to get appropriate help.	1	2	3	4	5
LEC3	3	Online learning does not help to solve content related questions.	1	2	3	4	5
LEC4	4	Online learning does not utilize a variety of information sources to explore problems.	1	2	3	4	5
LEC3	5	Not feel comfortable conversing through the online mode.	1	2	3	4	5
2. Individual Challenges							
IVS1	1	Difficulty in conversation during class	1	2	3	4	5
IVS2	2	Increase in workload	1	2	3	4	5
IVS3	3	Difficulty in applying innovative learning strategies	1	2	3	4	5
IVS4	4	Poor time management	1	2	3	4	5
IVS5	5	Lack of motivation	1	2	3	4	5
3. Course challenges							
CCS1	1	Online learning discourage group work	1	2	3	4	5
CCS2	2	Interactive Instructional Materials	1	2	3	4	5
CCS3	3	Isolated and more alienated	1	2	3	4	5
CCS4	4	Course accommodate different learning styles	1	2	3	4	5
CCS5	5	Lack of responses from students	1	2	3	4	5
4. Contextual Challenges							
CTC1	1	Lack of local contextualization	1	2	3	4	5
CTC2	2	Difficulty in comprehension	1	2	3	4	5
CTC3	3	Less communication with teachers	1	2	3	4	5
CTC4	4	Feeling anxiety in online learning	1	2	3	4	5
CTC5	5	Effect subjective wellbeing	1	2	3	4	5
5. Technological Challenges							

TCS1	1	Difficulty to in handling devices/ equipment's	1	2	3	4	5
TCS2	2	Increase in technophobia	1	2	3	4	5
TCS3	3	Non availability of resources (e.g., laboratory and physical activities).	1	2	3	4	5
TCS4	4	Poor internet connectivity	1	2	3	4	5
TCS5	5	Complication in software installation	1	2	3	4	5
6. Assessment and supervision challenges							
1	ASC1	Risk of plagiarism in online assessment	1	2	3	4	5
2	ASC2	Heavy workload In online supervision	1	2	3	4	5
3	ASC3	Internet connectivity during the assessment	1	2	3	4	5
4	ASC4	Online assessment chances of unfair for students with disabilities.	1	2	3	4	5
5	ASC5	Difficulty in using LMS for assessment purpose.	1	2	3	4	5
7. Socio-economic Challenges							
1	SEC1	Difficulty in managing devices for other family members.	1	2	3	4	5
2	SEC2	Loss of human interaction between teachers and students.	1	2	3	4	5
3	SEC3	Non availability of separate room at home for online learning.	1	2	3	4	5
4	SEC4	Multiple users at same time in the same home.	1	2	3	4	5
5	SEC5	High cost of internet facility.	1	2	3	4	5
8. Pedagogical Challenges							
1	PCS1	Inadequate curriculum design frameworks.	1	2	3	4	5
2	PCS2	Online learning is Inefficient.	1	2	3	4	5
3	PCS3	Difficulty uploading and downloading heavy document and reading materials through LMS.	1	2	3	4	5
4	PCS4	Unorganized course content in LMS.	1	2	3	4	5
5	PCS5	Increased human cyber interaction	1	2	3	4	5

Opportunities:

1. Research Innovations							
RIS1	1	Digital transformation of educational institutions.	1	2	3	4	5
RIS2	2	Designing of more scalable and personalized online learning models.	1	2	3	4	5
RIS3	3	Redesigning of learning process.	1	2	3	4	5
RIS4	4	Accommodation of contemporary teaching/learning model.	1	2	3	4	5
RIS5	5	Creating new research ideas in future.	1	2	3	4	5
2. Technological innovations							
TIS1	1	Increased technological skills	1	2	3	4	5
TIS2	2	Availability of new modes of communications	1	2	3	4	5
TIS3	3	Latest innovations in new software/ LMS	1	2	3	4	5
TIS4	4	Improved digital competency	1	2	3	4	5
TIS5	5	Adoption of technical strategies	1	2	3	4	5
3. Socio-economic interventions							
SES1	1	More liberty to teachers	1	2	3	4	5
SES2	2	Cost efficient in term of expenditure and time	1	2	3	4	5
SES3	3	Overcoming Capacity Constraints in education	1	2	3	4	5
SES4	4	Flexible scheduling and convenience	1	2	3	4	5
SES5	5	Provision of learning resources	1	2	3	4	5

QUESTIONNAIRE FOR STUDENTS

Dear Respondent,

I am a student of MPhil Education at National University of Modern Languages (NUML) Islamabad and doing my research study on the topic "**Comparative Study of Public and Private Universities Regarding Online Learning: Challenges and Opportunities"**

This questionnaire aims to highlight the challenges faced by the students in the university during online learning. You are kindly requested to fill out this questionnaire by following the instructions below. Your opinion will help us to get a realistic view about challenges and opportunities regarding online learning. There is no right or wrong answer, your response will be kept confidential and will only be used for research purpose.

Muhammad Aftab
MPhil Scholar
Department of Education
National University of Modern Languages Islamabad

Demographic Information

Name: (optional)_____
University: _____
Sector
Public_____
Private_____
Gender
Male_____
Female_____
Place, Residence, City_____
Faculty_____
Department: _____
Program: _____
Semester: _____
Date: _____

Answer Scale:

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Challenges:

1. Learning platforms Challenges							
LEC1	1	Online learning causes distractions at home.	1	2	3	4	5
LEC2	2	Online learning does not allow to get appropriate help.	1	2	3	4	5
LEC3	1	Online learning does not help to solve content related questions.	1	2	3	4	5
LEC4	2	Online learning does not utilize a variety of information sources to explore problems.	1	2	3	4	5
LEC5	1	Not feel comfortable conversing through the online mode.	1	2	3	4	5
2. Individual Challenges							
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Opportunities:

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NATIONAL UNIVERSITY OF MODERN LANGUAGES
FACULTY OF SOCIAL SCIENCES
DEPARTMENT OF EDUCATION

M.L.1-3/Edu/2021 Dated: 09-3-2021

To: **Muhammad Aftab,**
1779-M.Phil/Edu/F19

Subject: **APPROVAL OF M.Phil THESIS TOPIC AND SUPERVISOR**

1. Reference to Letter No, M.L.1-3/Edu/2021/, dated 16-02-2021, the Higher Authority has approved the topic and supervisor on the recommendation of Faculty Board of Studies vide its meeting held on 11th February 2021.

a. **Supervisor's Name & Designation**
Dr. Hukamdad Malik,
Associate Professor,
Department of Education NUML, Islamabad.

b. **Co-Supervisor's Name & Designation**
Ms. Samra Afzal
Assistant Professor

c. **Topic of Thesis**

Comparative Study of Public and Private Universities Regarding Online Learning: Challenges and Opportunities

2. You may carry out research on the given topic under the guidance of your Supervisor and submit the thesis for further evaluation within the stipulated time. It is inform you that your thesis should be submit within described period by **31 July 2022** positively for further necessary action please.

3. As per policy of NUML, all MPhil/PhD thesis are to be run on turnitin by QEC of NUML before being sent for evaluation. The university shall not take any responsibility for high similarity resulting due to thesis run from own sources.

4. Thesis are to be prepared strictly on NUML's format that can be had from (Coordinator, Department of Education)

Telephone No: 051-9265100-110 Ext: 2094
E-mail: ftabassum@numl.edu.pk

Dr. Marium Din
A/Head,
Department of Education

Distribution: Mr. Muhammad Aftab (M.Phil Scholar)

Dr. Hukamdad Malik (Thesis Supervisor)

Ms. Samra Afzal (Co-Supervisor)

Cover Letter for Validity Certificate

Comparative Study of Public and Private Universities Regarding Online Learning: Challenges and Opportunities

Subject: **Request for validity certificate**

Respected Sir/Madam

I have attached my questionnaire adapted for the purpose of research title as "Comparative Study of Public and Private Universities Regarding Online Learning: Challenges and Opportunities" The questionnaire is based on the COI model approach. This questionnaire outcome will be determined based on the experiences of students in the light of the opportunities and challenges faced by former and latter. It is adapted questionnaire so that we can use conceptual framework as well.

Kindly check my questionnaire its content and construction and provided your valuable suggestion for its improvement and certify its validity by filling the certificate attached at the end of the document.

Muhammad Aftab
M.Phil Scholar, Department of Education,
National University of Modern Languages,
Islamabad Pakistan.

Certificate for Tool Validation

COMPARATIVE STUDY OF PUBLIC AND PRIVATE UNIVERSITIES REGARDING ONLINE LEARNING: CHALLENGES AND OPPORTUNITIES

By Mr. Muhammad Aftab

M.Phil. scholar, Faculty of Social Sciences, National University of Modern Languages
Islamabad, Pakistan

This is to certify that questionnaires self-developed by scholar towards his thesis have been assessed and found appropriate for the data collection process. All the items in the tools are meeting the objectives and addressing the research questions and research hypotheses. Face and content validity are also assured, and can be used by the researcher for the data collection process.

Validated by: Dr. Maryum Din

Designation: Assistant Professor

Institute: National University of Modern Languages, Islamabad

Date of validation: 27/02/2022

Certificate for Tool Validation

COMPARATIVE STUDY OF PUBLIC AND PRIVATE UNIVERSITIES REGARDING ONLINE LEARNING: CHALLENGES AND OPPORTUNITIES

By Mr. Muhammad Aftab

M.Phil. scholar, Faculty of Social Sciences, National University of Modern Languages
Islamabad, Pakistan

This is to certify that questionnaires self-developed by scholar towards his thesis have been assessed and found appropriate for the data collection process. All the items in the tools are meeting the objectives and addressing the research questions and research hypotheses. Face and content validity are also assured, and can be used by the researcher for the data collection process.

Validated by: Dr. Shazia Zamir

Designation: Assistant Professor

Institute: NUML

Date of validation: 23/08/2022

Certificate for Tool Validation

COMPARATIVE STUDY OF PUBLIC AND PRIVATE UNIVERSITIES REGARDING ONLINE LEARNING: CHALLENGES AND OPPORTUNITIES

By Mr. Muhammad Aftab

M.Phil. scholar, Faculty of Social Sciences, National University of Modern Languages Islamabad, Pakistan

This is to certify that questionnaires self-developed by scholar towards his thesis have been assessed and found appropriate for the data collection process. All the items in the tools are meeting the objectives and addressing the research questions and research hypotheses. Face andcontent validity are also assured, and can be used by the researcher for the data collection process.

Validated by: _____

Dr. Kamal Zaman

Designation: Associate Professor

Institute: NDU Islamabad

Date of validation 1-03-2022

National University of Modern Languages
Quality Enhancement Cell
Sector H-9, P.O. Shaigan, Islamabad, Pakistan
Tel: +92-51-9265100 Ext 2246/2247
Web: www.numl.edu.pk

Dated: May 04, 2023

Faculty of Social Sciences

Subject: Turnitin Report of MPhil Thesis of Mr Muhammad Aftab (Educational Sciences)

1st – Attempt

This is to state that **MPhil** thesis of **Mr Muhammad Aftab** has been run through **Turnitin Software on May 04, 2023**. Paper ID is 2083673383 and similarity index is 07%. This is within the limit prescribed by the Higher Education Commission.

The subject similarity index report is attached for further processing, please.

FSS-165

(Dr. Khushbakht Hina)
Director
Quality Enhancement Cell

Dean/FSS

05/05/2023.

HOD ES!