

Impact of COVID-19 on teachers, teaching profession towards technology adaptation and attendance at educational institute: Evidence from Pakistan

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Abstract

The objective of our study is to explore the relationship between the COVID-19 pandemic and teacher attitudes towards technology adaptation and attendance. We take the 18 Educational institute data from the school education department from January 2020 to January 2021 to fulfil this objective. Our research is based on secondary data. Data is collected physically from the school information system and the Punjab Information Technology Board. The analysis is carried out through EViews using regression analysis. Our results show that COVID-19 has no significant relationship with teacher attendance. Teacher learning objectives and the COVID-19 pandemic have a significant negative relationship, which means that COVID-19 affect the learning process. Teacher adaptation towards technology has no significant relationship with the COVID-19 pandemic. Teacher training and development, teacher experience and age significantly positively impact teacher attendance, technology adaptation and attaining learning objectives. Teacher gender has a significant positive impact on teacher attendance and achieving learning objectives, but it has a negative relationship with technology adaptation in male teachers. Our research is helpful for the government and policymakers in terms of adapting

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technology and attaining learning objectives.

Keywords: COVID-19, teachers' attitudes, teaching profession, Primary level, learning objective.

1 Introduction

The worldwide case of COVID-19 Outbreak has dramatically changed almost all areas of life, including education, and Pakistan has not had an exemption from these changes (Haider et al., [2021](#)). The lack of preventing the division has prompted world pioneers to develop super-tough guidelines to break the COVID-19 spread chain. Several norms suggested by the World Health Organization (2019), such as social distancing and physical separation, presented laborious options for every nation to implement. In Indonesia, "massive social restrictions" were imposed in March 2020 due to the increasing number of people tainted with COVID-19 (Amelia, [2021](#)). In many countries in the school department, there is a shortage of teacher attendance due to the pandemic of the disease (Bergdahl et al., [2021](#)). According to our results, the teachers could not attain the learning objective during the pandemic. COVID-19 is true and based on real facts. When there are guttering people where the chance of COVID-19 disease increases (according to WHO instructions), especially in the child with a lack of immunity, in this way, teachers do not follow the same learning pattern that was disturbed by the COVID-19 holidays and the pandemic (Aytaç, [2021](#)). Conversely, the government can arrange training and development to adapt technology in the education sector.

The COVID-19 pandemic has profoundly impacted the global economy and the education sector, including teachers and their attitudes towards professionalism (Guoyan et al., [2021](#)). In this study, we have identified three main objectives to explore the impact of COVID-19 on teachers' attitudes towards attendance in teaching institutions, adaptation of technology in school activities, and attaining learning objectives in Pakistan. The first objective is to understand how COVID-19 has impacted teachers' attitudes towards attendance in teaching institutions in Pakistan.

The COVID-19 pandemic brought profound and lasting changes to Pakistan's education landscape (Anwar et al., [2023](#); Khan et al., [2021](#)). This research explores the multifaceted impact of the pandemic on teachers and the teaching profession, specifically focusing on their rapid adaptation to technology for remote learning (Anwar et al., [2023](#)). It also delves into the evolving attendance patterns at educational institutes, shedding light on the factors influencing student participation and engagement during this crisis. Through comprehensive data analysis, this study seeks to uncover the transformative potential of this unprecedented event, both in terms of pedagogical innovation and how technology can be harnessed to shape the future of education in Pakistan.

One notable research gap within the current study lies in the limited exploration of potential links between teachers' technological adaptation and their characteristics and experiences, such as age, years of teaching experience, or prior exposure to technology. By incorporating a more nuanced analysis that accounts for these variables, researchers could provide valuable insights into how various factors interact with technology adoption within the teaching profession, helping to tailor strategies for professional development and support based on individual needs and circumstances. Additionally, considering the dynamic nature of the pandemic, there may be a need for a longitudinal approach to ascertain the long-term effects of technology integration into teaching practices, thereby contributing to a more comprehensive understanding of its sustained impact in the educational context (Roman et al., [2022](#); Vladova et al., [2021](#)). Addressing these gaps would enhance the study's relevance and practical implications for educational stakeholders in Pakistan and beyond.

Teacher behavior and attendance are critical factors influencing the quality of education and

student outcomes (Bartanen, [2020](#)). Positive teacher behavior, characterized by enthusiasm, fairness, preparedness, and effective classroom management, creates a conducive learning environment that can significantly enhance student engagement and academic performance (Burden, [2020](#)). Conversely, negative behavior such as inconsistency, favoritism, or lack of professionalism can undermine student motivation and trust (Cooper, [2019](#)). Teacher attendance is equally important; consistent presence ensures continuity in learning, maintains classroom discipline, and demonstrates a commitment to students' education (Werang et al., [2019](#)). High absenteeism rates disrupt the instructional flow, burden substitute teachers more, and negatively affect student achievement (Wallace, [2020](#)). Therefore, fostering positive teacher behavior and ensuring regular attendance is essential for maintaining high educational standards and promoting student success (Mahoney et al., [2021](#)).

Our work makes numerous significant contributions to the existing educational research environment. Our data, which challenges the widely held belief that COVID-19 greatly impacts teacher attendance, opens up new paths for discussion and debate. This study provides future research suggestions to critically reassess existing ideas and models about the pandemic's influence on teacher attendance by highlighting the lack of a robust relationship. This investigation is a call to action for additional research in this area, demanding a new viewpoint on the intricate dynamics between educators and crises like COVID-19. Second, our study reveals an important aspect of the pandemic's impact: it negatively influences teacher learning objectives.

This discovery is critical for field methodology, encouraging a reassessment of research practices in the context of pandemic-related obstacles. It emphasizes the significance of tailoring research approaches and procedures to account for the unique circumstances and demands of events such as COVID-19. Furthermore, the implications of our research go well beyond academia. They are well received by teachers, administrators, and policymakers involved in educational technology adaptation. Our findings contribute to better educational policy, pedagogical practice, improved technological integration, and more effective teacher professional development programs. In a broader sense, our research helps mitigate the significant effects of the COVID-19 pandemic on education by providing educators with the knowledge and tools they need to manage and prosper in times of crisis. Finally, this study acts as a catalyst for good change, encouraging resilience and flexibility among educators and students while laying the groundwork for future research on teacher behavior and its consequences for student learning in an ever-changing educational landscape.

The remaining sections of this article follow this structure: Part 2 reviews new literature and theoretical background and proposes numerous theories to better understand variable relationships. Part 3 contains the conceptual framework, research design, and techniques. Part 4 presents the study's findings, while Part 5 discusses the conclusion, future research, limits, and practical applications.

2 Literature Review

Several theories can provide a theoretical framework to support the study on the impact of COVID-19 on teachers, the teaching profession towards technology adaptation, and attendance at educational institutes. The Technology Acceptance Model (TAM) is a widely used theory in technology adoption. It proposes that perceived usefulness and ease of use influence individuals' attitudes toward technology use and their intentions to use it (Prastiawan et al., [2021](#)). In the context of this study, TAM can be used to understand teachers' attitudes toward technology adaptation during the COVID-19 pandemic, including their perceptions of how useful and easy it is to integrate technology into their teaching practices (Utami, [2021](#)). Diffusion of Innovation Theory suggests that adopting innovations, such as technology, occurs in stages, and individuals' characteristics and perceptions influence their adoption decisions (Dearing, [2009](#)).

In the context of this study, the Diffusion of Innovation Theory can be used to understand the factors that may influence teachers' adoption of technology during the pandemic, including their attitudes toward innovation, their perceptions of the relative advantage of using technology, and their readiness to adopt new teaching practices (Raman et al., [2021](#); Sangeeta & Tandon, [2021](#)). Similarly, Social Cognitive Theory emphasizes the role of social and environmental factors in shaping individuals' behaviors and attitudes. In the context of this study, Social Cognitive Theory can be used to understand how teachers' attitudes toward technology adaptation and attendance at educational institutes may be influenced by factors such as social norms, peer influence, and institutional support during the COVID-19 pandemic (Lent et al., [1994](#); Schunk, [2012](#)).

Maslow's Hierarchy of Needs proposes that individuals have a hierarchy of needs, ranging from basic physiological needs to higher-order needs such as self-actualization (Yalch & Brunel, [1996](#)). During the pandemic, teachers may have faced challenges related to their basic physiological and safety needs, such as health concerns, job security, and personal safety (Ozamiz-Etxebarria et al., [2021](#)). Maslow's Hierarchy of Needs can be used to understand how these challenges may have influenced teachers' attitudes towards attendance at educational institutes and technology adaptation, as their higher-order needs may have been compromised during the pandemic. Moreover, Professionalism Theory focuses on the values, attitudes, and behaviors associated with professionalism in a specific occupation, such as teaching (Tichenor & Tichenor, [2005](#)).

The new Covid strain, COVID-19, is an infectious disease that previously appeared in Wuhan, China, in December 2019. The coronavirus, which spread almost all over the world with the intersection of Chinese lines, was declared a pandemic by the World Health Organization (WHO). With the wheezing of the wiped people, the beads dispersed into the climate are sent inward by breathing or hand contact and thus contaminate the mouth, nose, or eyes (Wang et al., [2020](#)). For example, the pandemic, with symptoms such as hacking, fever, and severe respiratory contamination, has had fatal consequences and endangered the world.

Public governments had to make revolutionary predictions such as social distancing (social separation), isolation rehearsals, military law, and travel and education restrictions to control the spread of the flare (Bahl et al., [2022](#)). The majority must stay home to slow the spread of flare-ups. This has caused many countries to suspend training exercises at schools. During the pandemic, schools and colleges' outcomes have affected numerous sub-studies (Bahl et al., [2022](#); Cavus et al., [2021](#)). The lack of physical and financial conditions made it important to switch to separate education during this period (Botelho et al., [2020](#)). Thus, many countries, such as China, Italy, the USA, the UK, and Georgia, began to keep education separate by suspending close and personal education to limit the impact of the pandemic on education.

Distance education is a computer-based demonstration strategy in which cooperation between lecturers and education professionals from a particular community is provided when classroom education cannot be done due to obstacles in all education and preparation measures (Eygü & Karaman, [2013](#); Hassan & Mirza, [2020](#)). Distance education is regarded as a promising development with adaptable learning conditions. Distance education, which has a long history, was first continued by mail and then by letter. Due to developments in radio and TV innovations, distance education courses started to be announced on radio and television (Pregowska et al., [2021](#)). With the development of satellite, fiber optic, and computer innovation, virtual learning conditions have continued with these developments.

With COVID-19, it can be well argued that an alternative perspective has been added to research on distance education, for example, "distance education in pandemic periods". The number of studies for distance education applications completed in different parts of the world during the pandemic increased step by step. One of the reviews on this subject is by (Arora & Srinivasan, [2020](#)). The study, conducted with 341 instructors in the Ghaziabad region of India, analyzed the

acceptance rate and the advantages and difficulties of distance education. Due to the review, it was discovered that several educators have positive thoughts about distance education and highlight issues such as network issues, education, and awareness. Another review evaluated the perspectives and appropriateness of missing students in college to remove education during the pandemic (Jain & Singh, [2021](#)). The results showed that inadequate training has a moral mindset towards distance learning due to adaptive learning opportunities. In their review, Xie et al. ([2022](#)) examined how sub-studies encounter home learning during the pandemic. The review recognized the necessary measures to concentrate alone and concentrate freely during the pandemic.

In Finland, through school termination, guidance and orientation for sub-studies have been achieved through distance learning, computerized learning conditions and arrangements, and, where essential, autonomous learning (Sahlberg, [2021](#)). Several ways to aid e-learning have been discovered, including making an e-Content Repository that distributes educational professionals' materials to work in e-learning conditions (Alenezi, [2020](#)). The Indonesian government's implementation of wide-ranging social constraints has affected the network's programs and its inadequate work in the learning framework. Distance education or web frameworks have responded to schools beginning to implement the From School to Home (SFH) framework (Tarigan et al., [2022](#)). SFH is a program that takes the learning cycle from school to home (Sari & Rachmawati, [2021](#)).

In light of the Ministry of Education and Culture's guidelines, schools should organize web-based learning to provide an important learning experience for sub-studies without dealing with requests to fulfill all curriculum requirements. SFH thinks about the incomplete training, the health and safety of teachers, education staff, and the network involved in this issue. Web-based learning highlights Internet-based lessons that are delivered concurrently and asynchronously. Coordinated learning is a type of learning that communicates directly between sub-students and educators. It is also used in web structures such as meetings and online speaking. So, unusual learning is an indirect learning method that uses a free learning approach (not simultaneously).

3 Hypothesis Development

3.1 Teacher's Attitude towards the teaching profession.

The recent review of guilt and truancy has focused on singular aspects of wonders and consequences of behavior. Bourn ([2008](#)) argues, for example, that delinquency is a form of 'self-restraint' for young women. Many investigative actions have already been identified by difficulty, social class, parental mentalities, and the link between less fortunate school attendance and financial variables. For example, (Eck et al., [1999](#)) explored the distance between the reasons for disagreement and guilt within the scope of social files. These include sub-work on danger, students' home basics, family lifestyles, problem behaviors, young offenders, academic capacities of the untrained, frustration in education, and character aspects. He published an inventory of early warning signs and prominent elements that influence students' school missions. These signs are particularly important in primary schools because exams clearly show that early recognition of the onset of criminality cannot be detected regularly.

H1: COVID-19 daily cases hurt teacher attendance in school.

3.2 Teacher's Attitude towards attaining Objectives.

E-learning has become consistently well-known in recent years and has gained wide acceptance as a "non-traditional" mode for further education (Baig et al., [2022](#)). All over the world, higher education institutions (HLIs) are gradually going to e-learning to help and improve their learning and demonstration exercises (Madni et al., [2022](#)). In this research, e-learning gives clues to various electronically validated learning (in organized/unorganized conditions) in which the student collaborates with instructors, content, and different students who pay little for space and time

(Kandakatla et al., [2020](#)). The capacity of e-learning advances has empowered HLIs to reach new students well, increase comfort, and increase their educational chances (Ndobe et al., [2024](#)). Educators and students do not need to rely solely on printed books, other physical media materials accessible in libraries, and limited materials for their educational needs (Sung et al., [2022](#)). Writing reliably recommends e-learning as the best option, as opposed to controlling restrictions on entry into education (Encarnacion et al., [2021](#)).

H2: *COVID-19 daily cases hurt the teachers in attaining learning objectives.*

3.3 Teachers and the student's environment requirement.

Another issue considered in the introduction of the exams here is the differentiation between those who seek to combine perspectives and those who seek to consider. While it is not clear that the two terms are often used inversely and hold fundamental significance across public boundaries, it has recently replaced its inclusion as a more extreme term in the extraordinary teacher's jargon. A common freedom speaks. In the UK setting, the mix standard is strictly linked to the distribution of the Warnock Report (1978), where the term is seen as a feature of a broader 'standardisation' development in Western countries (Purdy et al., [2020](#)). In this report, coordination took different structures - local integration (placing young people in truly standard schools with 'unique needs'), social connection (social cooperation at a non-educational level between children with 'exceptional needs' and their standard friends), and practical combination (learning similarly).

The discovery adopted in Australia on expert mentalities for reconciliation education provided data coverage. The work embraced between 1985 and 1989 has been the focus of head teachers, educators, analysts, preschool administrators, and expert meetings (Avramidis et al., [2000](#)). showed that they differ greatly in their views on what types of young people should be included effectively. These studies are based on the perspectives for consensus, inadequacies and education issues presented, and, less importantly, the expert foundation of the participants. The most exciting meeting was those in charge of preschool organising, and the most cautious meeting was the classroom instructors with heads in the middle, wealth trainers and therapists.

Another Australian study repeated a comparative degree of caution, including future educators (Guppy et al., [2022](#)), who split between the various needs, though inclusion was positive to general thinking. Different reviews have shown that the classroom educators of school district staff, such as administrators and mentors, who are more distant from inadequate training, express more refreshing perspectives for reconciliation than those closer to the classroom environment. Headteachers have been found to have the best mindsets to unite with classroom educators with the most negative perspectives, followed by expert curriculum instructors. Forlin (1995) found that instructors in Education Support Centers show tolerance in addition to a scientifically and truly disabled youth compared to teachers in the traditional standard classroom. Schools that conflict with a similar site. Forlin assumed that private curriculum asset educators would generally have a more refreshing inclusion tendency than their standard partners.

This distinction was also reflected in an example of the Greek standard and unique instructors (Lampropoulou & Padeliadu, [1997](#)), in a UNESCO study of 14 countries, made a broad distinction in the instructor results regarding the mix, with around 1000 educators with experience of showing children with SEN. The countries studied were Egypt, Jordan, Colombia, Mexico, Venezuela, Botswana, Senegal, Zambia, Australia, Thailand, Czechoslovakia, Italy, Norway and Portugal. Educators have supported various young people in coming to terms with traditional classes. Interestingly, Bowman noticed that in countries with a law requiring participation, educators transmit more ideal perspectives (47 to 93 percent). Instructors from countries that offered the most complex isolated training arrangement were less strong at consensus (going from 0 to 28 percent). (Leyser et al., [1994](#)) I have adopted a different study of educationalist perspectives on reconciliation in the USA, Germany, Israel, Ghana, Taiwan, and the Philippines. Their findings

showed that the combination of these nations contrasted their attitudes. Educators in the US and Germany had the best mindsets. The positive perspectives conveyed by German educators were surprising because Germany did not have a special curriculum arrangement at the time of the exam, there was no special curriculum preparation for educators, and children with SEN were educated in isolated environments. The mix was rehearsed in a test area.

3.4 Factors affecting the teacher's Attitude towards professionalism.

Stephens and Braun, (1980), in a study in the US, found that the mentality of inclusion was more precise when educators recognised that openly funded schools should educate rare young people. (Feldman & Altman, 1985) In their US-based study room, instructors with unique theoretical frameworks had more confident coordination mentalities based on the ethnic origin of the included child. Instructors with theoretical, applied frameworks demonstrated qualities defined by less demand, less cynicism, less relational hostility, and low-grade bullying. (Thomas, 1985) Investigated a study of educators in Devon, England, and Arizona, USA, and found that teachers who score low on traditionalism generally have more positive perspectives towards the combination. Moreover, (Norwich, 1994) compared the links of combination perspectives with political, socio-political, and other situational perspectives in his similar study of educators in the country and metropolitan areas in Pennsylvania, USA and Northampton Shire, England—factors (contact with incompetence, competent position).

This review determined corporatization and socio-political perspectives only in the UK test. Norwich assumed that although teachers' socio-political or philosophical beliefs and qualities have some relevance to the combination, mentalities alone cannot be considered a solid indicator, and other situational factors (regulation and social issues in the two regions) must be considered. Janney et al. (1995) found that most exam instructors were reluctant to admit teenagers who had SEN in their classes initially, as they predicted the worst situation in which both they and children with SEN would be left to fight for them. Later, these trainers, after being vital and sufficiently supported, became open to these young people. Respondents noticed that assistance from key experts effectively alleviated concerns that low-maintenance institutions would bring remarkable jobs to their hands. A massive reconstruction of the real climate (making structures usable in sub-works with real inadequacies) and the arrangement of adequate and appropriate equipment and materials have additionally been instrumental in advancing these inspiring mindsets. Support from specialist wealth educators has also been identified as an important factor in considering a positive trainer mindset (Kauffman et al., 1989).

Janney et al. (1995) found that one of the variables contributing to the success of the low-maintenance consensus program that respondents implemented was the presence of both relational and task-related practical assistance provided by the school's special curriculum trainers. (Avramidis & Norwich, 2002) argued that expert curriculum instructors are important colleagues in mentoring expert educators on the best way to open a particular topic to young people with SEN. (Ward et al., 1987) found that young people with a soft concrete inability to coordinate in standard classrooms do not make standard instructors feel uneasy due to the confidence arising from the presence of nomadic educators for these children. Their research showed that the experience of working with rogue educators influenced the mindset of the trainers.

3.5 Teacher's Attitude towards Technology Adaptation.

Inspirational mindsets will create objects where people generally express good feelings, beliefs and practices. Conversely, negative mindsets will likely arise when people have upsetting feelings, beliefs, and practices (Tok, 2011). There are no negative feelings, beliefs, and practices in the presence of good feelings. Several studies investigated the positive changes in pre-management educators' perspectives due to preparation. (Friedberg et al., 1958) Investigating the major changes towards positive during hypothetical courses and the changes in mindset during the study on

encouragement would be rough with the perspectives generally held by the school principal or managing instructor. (Bontempo & Digman, [1985](#)) Students entered programs thinking education was 'important, satisfying, and demanding. Some researchers (Loughran, [2002](#); Yost, [2006](#)) conducted a study on the Teacher Education Project, showing that substitute teachers expect to teach and are extremely confident in demonstrating practice. Several tests show that teacher training programs are insufficient to turn the mindsets of substitute teachers into positive ones (Saracaloğlu, [1992](#)). Cole et al. ([1993](#)) State that 'basic educator training programs have little effect on the professional behaviour of new trainers. (Kara et al., [2015](#)) Explained that the point of view of substitute teachers towards the call is 'moderate', which is heavily influenced by the mentalities of educator teachers. Moreover, the dissatisfaction of the substitute teachers with the instructor training program and the 'lack of participation' of the trainer teachers affected 'attitude scores' inversely.

Moreover, (Marso & Pigge, [1994](#)) examined longitudinal changes in the perspective of beginning educators during the preparatory and primary school years. Sixty-five amateur trainers have finished some of the mentalities for the endless supply of educators after working in training and towards the end of their first years of full-time education. The investigation showed that the perspectives of these educators did not change as they progressed through the preparation process or during the first year of training. Also, (Al-Rashid, [2013](#)) oversaw the mindset of recruiting and senior assistant educators in the first year. The results showed that incomplete training had a moral mindset and that senior sub-trainers' perspectives were more confident than rookies about the ground for calling. Then again, Gherunpong et al. ([2004](#)) found no distinction between the green beans of the substitute educators and their recent perspective. In any case, I studied the mentalities between green beans and senior students (classroom preschool educators) and first-grade teachers (in-service instructors). They found that the attitude scores of the senior lower students were higher than those of the two meetings. He looked at the perspectives of senior metallics regarding first-year recruiting and non-training. The discoveries showed that senior educators have more inspiring perspectives than green beans.

H3: COVID-19 daily cases positively impact the teacher towards adopting the technology.

3.6 Teacher training development and teacher attitude.

Teacher training and development and teacher attitude have been widely studied in education. Previous literature has highlighted the importance of ongoing professional development for teachers and the role of teacher attitude in shaping instructional practices and student outcomes. Research (Baroudi, [2023](#); Shah & Bhattarai, [2023](#)) has shown that effective teacher training and development programs can significantly impact teacher knowledge, skills, and attitudes, improving student achievement. These programs can encompass various approaches, such as workshops, seminars, coaching, mentoring, and online courses. They can focus on pedagogical content knowledge, classroom management, assessment, and technology integration (Darling-Hammond et al., [2023](#)). Furthermore, previous literature has emphasised the importance of teacher attitude in the teaching profession (Martinez et al., [2023](#)). Teacher attitude, defined as the beliefs, values, and emotions teachers hold towards their work, students, and the educational context, can significantly influence their instructional practices and student interactions (French et al., [2023](#)).

Positive teacher attitudes, characterised by a growth mindset, self-efficacy, and a commitment to continuous learning, have been associated with more effective teaching practices, higher student engagement, and improved student outcomes (Slaton et al., [2023](#)). However, the impact of external factors, such as the COVID-19 pandemic, on teacher training, development, and attitude needs to be considered. The pandemic has brought unprecedented challenges to the education sector, disrupting traditional teacher training and development modes and affecting teacher attitudes towards their profession. With the shift to remote and hybrid learning, teacher training and

development have also undergone significant changes, with a greater emphasis on online platforms and virtual professional development opportunities (Darling-Hammond, [2023](#)). This has required teachers to adapt to new technologies, pedagogies, and student engagement strategies and may have influenced their attitudes towards technology adoption in the classroom. The COVID-19 pandemic has also brought about unique challenges that have impacted teacher attitudes towards their profession.

Teachers have had to cope with increased workloads, higher levels of stress and anxiety, and concerns about health and safety, which could potentially impact their attitudes towards their profession (Salame et al., [2023](#)). Additionally, disruptions in the learning process due to the pandemic, such as changes in attendance patterns and difficulties in achieving learning objectives, may also have affected teacher attitudes towards their effectiveness as educators (Antera & Pavlakis, [2023](#)). Moreover, previous literature (Tai & Omar, [2023](#); Yudit et al., [2023](#)) has established the significance of teacher training, development, and attitude in shaping effective instructional practices and student outcomes. The COVID-19 pandemic has posed unique challenges to teacher training, development, and attitude, and further research is needed to understand the impact of the pandemic on these factors and inform strategies to support teachers in navigating the current educational landscape. Hence, I propose the following hypothesis:

H4: *Training and development of Teachers have a positive impact on teacher attendance in school.*

H5: *Teachers' Training and development positively impact the teachers' attainment of learning objectives.*

H6: *Training and development of teachers positively impact the teacher's ability to adapt to the technology.*

3.7 Teacher experience and Teacher attitude.

Teacher experience and teacher attitude are important factors that influence instructional practices, student outcomes, and overall teacher effectiveness. Previous literature (Huang et al., [2021](#); Kerdtip et al., [2023](#)) has explored the relationship between teacher experience, defined as the number of years of teaching or the accumulated teaching expertise, and teacher attitude, which encompasses the beliefs, values, and emotions that teachers hold towards their work, students, and the educational context. Research has shown that teacher experience can significantly impact teacher attitude. Teachers with more experience tend to have more positive attitudes towards their profession as they gain confidence, develop a deeper understanding of pedagogy, and become more proficient in classroom management and instructional strategies (Daniëls et al., [2021](#)).

Experienced teachers are also more likely to exhibit a growth mindset, where they view challenges as opportunities for learning and improvement and are more likely to engage in reflective practices to continuously improve their teaching (Gore & Rickards, [2021](#)). Furthermore, teacher attitude is closely related to instructional practices and student outcomes. Positive teacher attitudes, characterised by a strong sense of self-efficacy, a belief in the value of teaching, and a commitment to students' learning, have been associated with more effective instructional practices, higher student engagement, and improved student achievement (Camacho et al., [2022](#)). Teachers with positive attitudes are more likely to be motivated, resilient, and adaptive in their instructional practices, leading to better student outcomes (Yentür, [2023](#)).

However, it is important to note that the COVID-19 pandemic has brought unprecedented challenges to teachers' experience and attitude. The sudden shift to remote and hybrid learning, increased workload, higher levels of stress and anxiety, and concerns about health and safety have significantly impacted teachers' experience and attitudes (Huang et al., [2021](#)). Teachers have had to quickly adapt to new technologies, pedagogies, and student engagement strategies, which may

have influenced their attitudes towards their profession. Recent literature has highlighted the importance of considering positive impacts on teachers' experiences and attitudes. Some studies have found that the pandemic has increased teacher stress levels, burnout, and decreased job satisfaction (Antoniou et al., [2024](#)). Teachers may also face challenges in maintaining positive attitudes towards their profession due to disruptions in the learning process and uncertainties about the future. Future research must investigate the relationship between teacher experience, attitude, and the impact of the COVID-19 pandemic further.

This could involve exploring how the pandemic has affected teachers' experience, attitudes, and instructional practices and identifying strategies to support their resilience, well-being, and professional development during and after the pandemic. Additionally, research can explore how technology and online teaching experiences during the pandemic may have influenced teachers' attitudes towards technology adoption in the classroom, as this has become a crucial aspect of education during the pandemic. Moreover, teacher experience and attitude are important factors that influence instructional practices and student outcomes. The COVID-19 pandemic has posed unique challenges to teachers' experience and attitude, and further research is needed to understand the impact of the pandemic on these factors and inform strategies to support teachers in navigating the current educational landscape. Therefore, we tried to test the following hypothesis:

H7: *The teacher's experience positively impacts the teacher's attendance in school.*

H8: *The teacher's experience positively impacts the teacher's attainment of learning objectives.*

H9: *The teacher's experience positively impacts the teacher's adaptation to technology.*

3.8 Teacher Age and Teacher Attitude.

The relationship between teacher age and teacher attitude has been a topic of interest in educational research, with studies exploring how age may influence teachers' beliefs, values, emotions, and practices in the classroom. Previous literature has presented mixed findings on this topic. Some studies have found that teacher age can influence their attitudes towards their profession. For example, older teachers may have more experience and accumulated wisdom, which could positively impact their attitudes towards teaching (Bleidorn et al., [2022](#)). Older teachers may also exhibit higher levels of job satisfaction and commitment to their profession, as they may have developed a sense of purpose and identity in their teaching career (Butakor et al., [2021](#)). Some previous research, such as (Cataudella et al., 2021; Yang, 2021), has also shown that older teachers tend to have higher levels of self-efficacy, a belief in their ability to positively impact student learning, which can contribute to more positive attitudes towards teaching.

However, other studies have found that teacher age may not significantly predict teacher attitude. (Baroudi et al., [2022](#)) Age is not significantly related to teacher job satisfaction or commitment, and younger teachers may exhibit similar positive attitudes towards their profession as older teachers. Other studies have found that age may be less influential than other factors, such as teacher experience, workload, and contextual factors, in shaping teachers' attitudes towards their profession (Toropova et al., [2021](#)). Future research should investigate the relationship between teacher age and attitude, considering contextual factors, personal characteristics, and other mediating factors to understand this relationship comprehensively in different educational contexts. This knowledge can inform strategies to support teachers' professional development and well-being, regardless of their age, and contribute to enhancing the overall quality of education. Based on the literature and perceived, we proposed the following hypothesis:

H10: *The teacher's age hurts the teacher's attendance in school.*

H11: *The teacher's age positively impacts the teacher's ability to attain learning objectives.*

H12: *The teacher's age positively impacts the teacher's adaptation to the technology.*

3.9 Teacher Gender and Teacher Attitude.

The relationship between teacher gender and teacher attitude has been a topic of interest in educational research, with studies exploring how gender may influence teachers' beliefs, values, emotions, and practices in the classroom. Previous literature has presented mixed findings on this topic. Some studies have found that teacher gender can influence their attitudes towards their profession. For example, research has shown that female teachers may exhibit higher job satisfaction and commitment to their profession than male teachers (Topchyan & Woehler, [2021](#)). Female teachers may also report higher levels of empathy and nurturing behaviors, which can positively impact their attitudes toward teaching (Aldrup et al., [2022](#); Wink et al., [2021](#)). Additionally, female teachers may have greater efficacy in managing classroom behavior and engaging students in learning, contributing to more positive attitudes toward teaching (Valente et al., [2020](#)). On the other hand, other studies have found that teacher gender may not significantly predict teacher attitude. For example, some research has found that gender is not significantly related to teacher job satisfaction, commitment, or self-efficacy (Cayupe et al., [2023](#); Mokhtar et al., [2023](#)). Other studies have found that gender may be less influential than other factors, such as teacher experience, workload, and contextual factors, in shaping teachers' attitudes toward their profession (Stoet & Geary, [2020](#)).

It is important to note that the relationship between teacher gender and teacher attitude may also be influenced by contextual factors, such as the cultural, social, and educational context in which teachers work. For example, in some cultures, traditional gender roles and expectations may influence teachers' attitudes towards their profession, with female teachers expected to be nurturing and caring and male teachers expected to be authoritative and assertive (Lavy et al., [2020](#)). These cultural norms and expectations may impact the attitudes of male and female teachers differently.

Furthermore, it is important to consider that other factors, such as personal characteristics, professional development opportunities, and job satisfaction, may mediate the impact of teacher gender on teacher attitude. For example, female teachers who face gender-based discrimination or bias may exhibit different attitudes towards their profession than male teachers (Valente et al., [2020](#)). Additionally, the gender composition of the teaching workforce in a particular context may also influence teachers' attitudes, with male teachers being in the minority in many educational settings, and this gender imbalance may impact their attitudes towards their profession (Toprak et al., [2021](#)).

In conclusion, the relationship between teacher gender and teacher attitude is complex and may be influenced by various factors. While some research suggests that gender may be a significant predictor of teacher attitude, other studies indicate that gender may be less influential than other factors. It is important for future research further to investigate the relationship between teacher gender and attitude, considering contextual factors, personal characteristics, and other mediating factors to gain a comprehensive understanding of this relationship in different educational contexts. This knowledge can inform strategies to support teachers' professional development and well-being, regardless of gender, and promote gender equity in the teaching profession. To see the previous study literature about the different pandemics in the world, we developed the following alternative hypothesis;

H13: *The teacher's gender significantly positively impacts the teacher's attendance in school.*

H14: *The gender of the Teacher has a positive impact on the teacher's adaptation to technology.*

H15: *The gender of the teacher has a positive impact on the teacher's ability to attain learning objectives.*

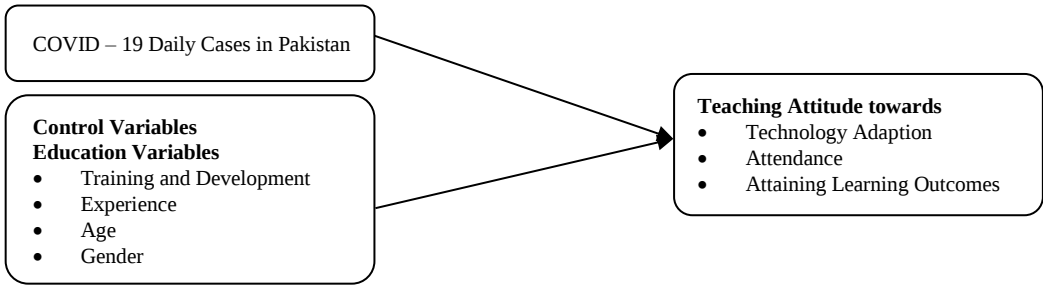


Figure 1: Conceptual framework

4 Material and Methods

4.1 Study design and settings

Our research is based on quantitative analysis based on the secondary database. Our research should be based on descriptive statistics and the correlation matrix through the EViews, and the hypothesis should be tested through regression analysis. Our main objective of the research is to explore the impact of COVID-19 on attendance, learning objective-attaining motives and the adaptation of technology by government teachers, especially in Pakistan, an emerging economy. For this purpose, we selected secondary data from different schools and registers of higher management for analysis. The analysis should be done by manipulating pre-existing statistical data using computational techniques on the software EViews with the help of descriptive statistics and regression analysis.

Table 1: Rating criteria of the variable

Variable Name	Rating (Efficient)	Rating (Below criteria)	Rating (Low)	Rating (Very low)
Teacher Attendance	75%-100%	51%-75%	26%-50%	0-25%
Learning objective	75%-100%	51%-75%	26%-50%	0-25%
Technology adaptation	75%-100%	51%-75%	26%-50%	0-25%

4.2 Data Collection and Instruments

Teacher attendance should be collected from each school's register by field visit. Teachers to attain learning objectives data are collected from the register of the QAED (Quad e Azam Academy of Educational Development Khanewal). QAED makes the online data frame for the teachers to attain objectives through long-term training and evaluate every teacher's performance through the online system SIS (School information system). Each teacher is evaluated online to attain the learning objective through the lecture's physical observation by the assistant education officers. This shows the school's performance towards attaining the learning objective in the shape of grading and learning objectives achieved or not achieved. In this type, we take a dummy variable that, if the learning objective is attained, is denoted by 1; otherwise, 0. Teachers towards the adaptation of the technology data should attain the percentage of the teachers in school who use technology like Taaleem Ghar made by the Education Department Punjab and the use of the SIS (School Information System).

Data can be collected from the online SIS website and physical collection from the concerned sources. In Punjab, Pakistan, there are 5750 schools with 654113 teachers working in Punjab, Pakistan. The population selection is because teachers are health conscious and lack knowledge about technology implementation. From the total population, we collected 3600 schools for analysis through random sampling—the sampled schools selected from Punjab and 100 schools from each district. Our sample size includes 18 schools with 115 teachers working there. In data,

we take the daily percentage of the attendance and the learning objective, attaining the monthly indicators by QAED that create the balancing problem. To solve this problem, we take the teacher attendance average monthly for each school and the same as the technology adaptation data on an average monthly basis from January 2020 to January 31, 2021. Our study is based on the secondary database. The data collection instruments are used by physical data collection from the registers of the concern variables already discussed in data collection. These resources are reliable because they are also governed by the PITB (Punjab Information Technology Board).

Table 2: Measurement of research variables

Variable name	Measurement	Sign	Data source / References
Teacher Attendance	Monthly average teachers' attendance in selected schools	TA	Attendance register of each school and also on the SIS https://sis.punjab.gov.pk/
Learning objective	learning objective attained then denoted by 1; otherwise, 0	TLO	QAED and SIS website through the portal of AEO http://qaed.edu.pk/ https://sis.punjab.gov.pk/
Technology adaptation	Percentage of the teacher's adaptation of the technology (monthly basis Observation by school education department)	TTA	QAED and SIS website through the portal of AEO http://qaed.edu.pk/ https://sis.punjab.gov.pk/
Training and Development of Teachers	Numbers of the training given by the department to the teachers	TDT	QAED and SIS website through the portal of AEO http://qaed.edu.pk/ https://sis.punjab.gov.pk/
Experience of Teacher	Numbers of the year's teacher has experience of teaching	EXP	QAED and SIS website through the portal of AEO http://qaed.edu.pk/ https://sis.punjab.gov.pk/
Age of Teacher	Age in years of the teacher	AGE	QAED and SIS website through the portal of AEO http://qaed.edu.pk/ https://sis.punjab.gov.pk/
Gender of teacher	If male, then represented by 1; if female, then represented by 0	GEN	QAED and SIS website through the portal of AEO http://qaed.edu.pk/ https://sis.punjab.gov.pk/

For the accurate results of the study, we used the EViews 10 version because it is the approved software for secondary data analysis, especially in regression and the exploration of relationships. Three models are adopted for the analysis purpose of our study that are given below,

$$1.TA_{it} = \alpha_0 + \beta_1 COVID_{it} + \beta_2 TDT_{it} + \beta_3 EXP_{it} + \beta_4 AGE_{it} + \beta_5 GEN_{it} + \varepsilon_{it} \text{ Model No } 2.TLO_{it} = \alpha_0 + \beta_1 COVID_{it} + \beta_2 TDT_{it} + \beta_3 EXP_{it} + \beta_4 AGE_{it} + \beta_5 GEN_{it} + \varepsilon_{it}$$

$$\text{Model No } 3.TTA_{it} = \alpha_0 + \beta_1 COVID_{it} + \beta_2 TDT_{it} + \beta_3 EXP_{it} + \beta_4 AGE_{it} + \beta_5 GEN_{it} + \varepsilon_{it}$$

The secondary data should be collected from the register of attendance from each school by physically visiting and fetching necessary information from the register based on the physical methods without a questionnaire. The data in this type is reliable due to the physical involvement of the researcher. The timeframe required for the data collection is about four days. In 4 days, all the data collection will be completed.

5 Results and Discussions

Our analysis includes descriptive statistics, some graphs related to the data, and the regression analysis results of the three models.

Table 3: Descriptive and Correlation

	COVID	TA	TLO	TTA	TTD	EXP	AGE	GEN
Mean	11291.670	0.822	0.333	0.491	0.651	20.170	51.197	0.521
Median	15632.000	0.943	0.000	0.488	0.488	13.870	43.871	0.490
Maximum	19870.000	0.949	1.000	0.568	0.709	33.106	61.071	1.000
Minimum	0.000	0.238	0.000	0.440	0.232	1.074	29.132	0.000
Std. Dev.	8247.029	0.252	0.500	0.044	0.252	0.460	0.322	51.897
COVID	1.000							
TA	0.097	1.000						
TLO	-0.003	-0.003	1.000					
TTA	-0.027	-0.027	0.085	1.000				
TTD	-0.036	-0.034	0.088	0.739	1.000			
EXP	-0.001	-0.001	-0.005	0.035	0.069	1.000		
AGE	-0.001	-0.001	-0.003	0.017	0.013	-0.001	1.000	
GEN	-0.039	-0.041	0.061	0.587	0.582	0.019	0.011	1.000

Our descriptive statistics show that the COVID-19 average monthly cases are 11291 in the respected sample period, with a maximum of 19870 cases monthly with a high std. Dev. The total teacher attendance for the selected school is an average of 82%, with a minimum of 23% when only one teacher or 1/3 teachers are allowed to enter the school. The Dummy variables one and two measure the learning objective. The teacher's technology adaptation is about 49% on average, which means that 49% of teachers use technology innovation in the school, with a maximum value of 56% in some school indicators, with the lowest value of 44% being compulsory by the school education department like online attendance, leave management and also Punjab school education department announced the Human resource management system for each teacher. About 65 % of teachers attain training from the school education department. The average experience of the teacher is 20 years, and the average age is 51 years. Also, about 52% of the teachers in this department are male. All the correlation values between the variables are less than 0.80, indicating fit for the analysis.

Table 4: Result Models

	Model 1		Model 2		Model 3	
Variable	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
COVID	0.000	0.202	0.000	0.062**	0.000	0.601
TDT	0.199	0.000***	8.790	0.000***	2.191	0.001***
EXP	2.191	0.002***	1.675	0.005***	0.735	0.016***
AGE	2.981	0.000***	0.871	0.052**	0.923	0.013***
GEN	0.781	0.987	-0.159	0.001***	1.901	0.000***

Note. Results are significant at 1%, 5% and 10% significance level.

In our first model result, Teacher attendance is the dependent variable, and the COVID-19 average monthly cases are the independent variable. Our results show that COVID-19 cases and teacher attendance have a weak relationship due to some reasons that should be discussed. Our results show no significant relationship between them because their p-value is 0.2023, which is no significance at any level of significance like 10%, 5% and 1% levels, which is the criteria of a strong relationship between them. The coefficient value is greater in numeric because TA is based on monthly percentages, but COVID-19 are based on patient numbers.

In our second model result, the Teacher attaining learning objective is the dependent variable, and the COVID-19 average monthly cases are the independent variable. Our results show that COVID-19 cases and teacher attendance have a significant relationship due to some reasons that should be

discussed. Our results show a negative significance relationship between them because their p-value is 0.06, which is significant at a 10% level of significance levels, which is the criteria for a strong relationship between them. Our result shows that when the number of COVID-19 cases increased, teachers could not achieve their targets for learning.

In our third model result, Teacher attitude towards technology adaptation is the dependent variable, and the COVID-19 average monthly cases are the independent variable. Our results show that COVID-19 cases and technology adaptation have no significant relationship due to some reasons that should be discussed. Our results show no significant relationship between them because their p-value is 0.601, which is no significance at any level of significance like 10%, 5%, and 1% levels. That is the criterion for a strong relationship between them. The coefficient value is greater in numeric because TTA is based on monthly percentages, but COVID-19 is based on patient numbers. From all three models' results, we find out that COVID-19 has no impact on teacher attendance, but we can say that there is little impact on suggestion with its p-value of 0.203, which is near the 10% significance level. In Pakistan, the education department of Punjab makes some restrictions due to dual control and management. In all models, the control variables such as Teacher training and development, teacher experience, and teacher age significantly positively impact teacher attendance, technology adaptation, and attaining learning objectives. Teacher gender has a significant positive impact on teacher attendance and attaining learning objectives, but it has a negative relationship with technology adaptation in male teachers.

On the other hand, COVID-19 hurts the teacher's attaining the learning objective; in that case, our results are significant, showing a real impact on the learning objective. In the third case, there is no significant relationship because the value is 0.60, that has very far from the level of significance; it means that technology adaptation is not caused by the disease, which depends on the teacher's behavior and the training of the technology usage (Arora & Srinivasan, 2020). The first and third hypotheses rejected the alternative hypothesis because we failed to reject the null hypothesis at different significance levels. There may be some reasons for the rejection of the alternative hypothesis. We discuss each hypothesis based on scientific opinions.

In the first hypothesis, we make the null hypothesis that COVID 119 has a negative impact, but in our result, there is no significant but weak relationship between them. In our first model result, Teacher attendance is the dependent variable, and the COVID-19 average monthly cases are the independent variable. Our results show that COVID-19 cases and teacher attendance have a weak relationship due to some reasons that should be discussed. Our results show no significant relationship between them because their p-value is 0.2023, which is no significance at any level of significance like 10%, 5%, and 1% levels, which is the criteria of a strong relationship between them. The coefficient value is greater in numeric because TA is based on monthly percentages, but COVID-19 is based on patient numbers.

The education department has been much stronger in the previous ten years due to some measures and control monitored by the two authorities. The first is the Education Department Punjab, and the second is the Chief Minister monitoring cell. The Punjab education department has a different but approachable management hierarchy in the shape of the assistant education officer controlling a few schools. The monitoring cell MEA (monitoring elevation officer) visits every school every month but has strong control over the job by implementing the penalty for the absence of the teachers. During COVID-19, the MEA also visited the school, and every teacher was afraid of this department due to the noncompliance behaviors of the officers.

In that hypothesis, we reject the null hypothesis and accept the alternative. There is a negative and significant relationship between COVID-19 and teachers attaining the learning objectives due to the stress in mind and fear of the disease in the world that is increasing day by day, and vaccines have not yet been invented in the world. In our second model result, the Teacher attaining learning

objective is the dependent variable, and the COVID-19 average monthly cases are the independent variable. Our results show that COVID-19 cases and teacher attendance have a significant relationship due to some reasons that should be discussed. Our results show a negative significance relationship between them because their p-value is 0.06, which is significant at a 10% level of significance levels, which is the criteria of a strong relationship between them (Skipper et al., 2017). Our result shows that when the COVID-19 cases increased, teachers could not achieve their targets towards learning. When a teacher is stressed and does not give their full attention towards learning during the COVID-19 pandemic, they do not attain their learning objectives. We failed to reject our null hypothesis in that hypothesis.

In our third model result, Teacher attitude towards technology adaptation is the dependent variable, and the COVID-19 average monthly cases are the independent variable. Our results show that COVID-19 cases and technology adaptation have no significant relationship due to some reasons that should be discussed. Our results show no significant relationship between them because their p-value is 0.601, which is no significance at any level of significance like 10%, 5% and 1% levels. That is the criterion for a strong relationship between them. The coefficient value is greater in numeric because TTA is based on monthly percentages, but COVID-19 are based on patient numbers. Now, there is the time for technology to work at home. In the education department, there is a lack of proper platforms for online classes and facilities for teachers to conduct online learning. The government should give the training and the online platform for the technology adaptation with the training.

6 Conclusion and Recommendations

From our results, we conclude that despite the pandemics of COVID-19, there are priceable steps teachers can take to increase their attendance, which is a great thing or contribution. In many countries in the school department, there is a shortage of teacher attendance due to the disease pandemic. According to our results, the teachers could not attain the learning objective during the pandemic. COVID-19 is true and comprises the real facts. When people are guttering, the chance of COVID-19 disease increases (according to WHO instructions), especially in children who lack immunity. In this way, teachers do not follow the same learning pattern disturbed by the COVID-19 holidays and the pandemic. Conversely, the government can decide on training and development to adapt technology in the education sector.

The implications of your study's findings can be discussed in several key areas. First, COVID-19 has no significant relationship with teacher attendance, and teacher learning objectives are significantly negatively impacted by the pandemic, which can have implications for educational policy and practice. Policymakers and educational institutions may need to consider strategies to address teachers' challenges in maintaining attendance and achieving learning objectives during pandemic-related disruptions. This could include providing additional support, resources, or professional development opportunities to help teachers adapt to the changing circumstances and ensure continuity in education. Second, teacher adaptation towards technology has no significant relationship with COVID-19 and can have implications for integrating technology into education.

It suggests that the pandemic may not have necessarily accelerated the adoption of technology by teachers as previously assumed. This finding could highlight the need for further efforts to promote effective and meaningful use of technology in educational settings, especially during times of crisis, and provide insights into the factors that influence teachers' technology adoption. Third, the findings of your study can also have implications for professional development programs for teachers. As the pandemic has brought about changes in the education landscape, teachers must acquire new skills and strategies to cope with the evolving challenges. Professional development opportunities that focus on addressing the impact of COVID-19 on attendance, learning objectives, and technology adaptation could be developed and offered to teachers to enhance their resilience

and effectiveness in teaching during crises.

Future Research Directions: Our study findings also suggested the potential areas for future research. Moreover, further investigation could explore why COVID-19 may not have significantly impacted teacher attendance or examine the challenges teachers face in achieving learning objectives during the pandemic. Additionally, more research could be conducted to understand the factors that influence teachers' adaptation towards technology during crises and to identify effective strategies for promoting technology integration in education. To conduct the study across the different departments of education, like colleges and higher secondary school systems, is the limitation of the study due to the different structure and culture of these organisations from the school educational system; hence, these factors may be the future research topics. Moreover, future studies should include other factors that affect the teachers' adaptation of the technology, such as training, new innovations, and previous education.

7 References.

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