

**EXPLORING CONTINGENCY IN DIGITAL
LITERACY PRACTICES OF SECONDARY SCHOOL
TEACHERS IN QUETTA BALUCHISTAN**



Researcher:

Siraj Ud Din

18-FOE/MSTE/F23

Supervisor:

Dr. Muhammad Zafar Iqbal

**DEPARTMENT TEACHER EDUCATION
FACULTY OF EDUCATION
INTERNATIONAL ISLAMIC UNIVERSITY ISLAMABAD
PAKISTAN
(October 2025)**

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A thesis submitted in partial fulfilment of the requirement for the degree of Master
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**DEPARTMENT TEACHER EDUCATION
FACULTY OF EDUCATION
INTERNATIONAL ISLAMIC UNIVERSITY ISLAMABAD
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Dedication

This thesis is dedicated to our beloved Prophet Hazrat Muhammad (PBUH) who is the role model of humanity, my treasured mother, whose sincere prayers have given me the courage to confront life's snags with love and tolerance. My father's long-lasting support, my teachers' invaluable guidance, and my friends' caring comfort are all possessions for that I am extremely appreciative.

SUPERVISOR’S CERTIFICATE

The thesis titled “**Exploring Contingency in Digital Literacy Practices of Secondary School Teachers in Quetta Baluchistan**” submitted by Mr. Siraj Ud Din, Reg. No: 18-FOE/MSTE/F23 in partial fulfilment of MS degree in Teacher Education has been completed under my guidance and supervision. I am satisfied with the quality of student’s research work and allow him to submit this for further processing as per IIUI rules and regulations.

Date: _____

Supervisor:

Dr. Muhammad Zafar Iqbal

APPROVAL SHEET

Exploring Contingency in Digital Literacy Practices of Secondary School Teachers in Quetta Baluchistan

By

Siraj Ud Din

18-FOE/MSTE/F23

Accepted by the Department of Teacher Education, Faculty of Education, International Islamic University Islamabad, in the partial fulfilment of the award of the degree of “**MS TEACHER EDUCATION**”

Viva Voce Committee:

Supervisor: _____

(Dr. Muhammad Zafar Iqbal)

Internal Examiner: _____

External Examiner: _____

Date: _____

Chairman: _____

Department of Teacher Education,
Faculty of Education,
International Islamic University,
Islamabad.

Dean: _____

Department of Teacher Education,
Faculty of Education,
International Islamic University,
Islamabad.

AUTHOR’S DECLARATION

I, Siraj Ud Din, Reg. No: 18-FOE/MSTE/F23 as a student of MS in Teacher Education at International Islamic University, Islamabad do hereby declare that the thesis entitled **“Exploring Contingency in Digital Literacy Practices of Secondary School Teachers in Quetta Baluchistan”**, submitted for the partial fulfilment of MS in Teacher Education is my original work, except where otherwise acknowledged in the text and has not been submitted or published earlier and shall not in future, be submitted by researcher for obtaining and degree from this or any other university or institutions.

Siraj Ud Din

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Abstract

This study explores the digital literacy practices of secondary school teachers in District Chaman, Baluchistan, in view of rising information and communication technologies (ICT) integration in school teaching. The study aimed at measuring teachers' digital tool proficiency, attitudes toward technology enriched learning and challenges facing effective digital adoption. A mixed-method approach was adopted to achieve the objectives of the study. Data was collected from secondary school teachers through semi-structured interviews and class observations. Statistical analysis determined that majority of the teachers were in the view of using popular platforms like YouTube, WhatsApp, PowerPoint, and Google Classroom, their proficiency and higher-order applications. Qualitative results indicated that majority of the teachers are highly motivated for using digital tools but also cited structural constraints, such as unsteady internet connections, infrastructural inadequacy, and lack of professional training. The study concluded that although teachers in District Chaman recognized the pedagogical value of digital literacy and systemic barriers in its effective implementation. These gaps need to be addressed with comprehensive professional development programs, improved digital infrastructure, and policy support to enhance teachers' technological competencies. Digital literacy within this local context, contributed to broader discussions on equitable technology integration in education and offers practical recommendations for strengthening secondary school teaching in underdeveloped regions like District Chaman.

Key Words: Digital literacy, Secondary school teachers, ICT integration, Teacher training, educational technology, Digital tools, District Chaman, Baluchistan, Pakistan, Digital pedagogy.

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CHAPTER 1

INTRODUCTION

Today's literacy covers more than just reading and writing; it also includes digital competency, which is necessary to navigate a society that is becoming more dependent on technology. Studying how teachers get and use digital literacy has become important as educational institutions throughout the world include digital resources into teaching. In District Chaman, Baluchistan, where technological and infrastructure limits may affect the use of digital in education, this study focuses on the digital literacy practices of secondary school teachers.

Literacy: Literacy is defined as the ability to read and write. The capacity to successfully use words, numbers, pictures, and other types of communication to achieve social, professional, and personal objectives is known as literacy. This involves the ability to read, write, and understand as well as the ability to assess, evaluate, and interpret data from a range of media and sources. UNESCO. (2022).

Digital Literacy: Digital literacy covers the ability to access, assess, generate, and share information through digital technologies. It extends beyond basic technical skills to involve critical thinking, ethical conduct, and responsible behavior online (Ng, Leung, Chu, & Qiao, 2021; UNESCO, 2018). For teachers, it encompasses the effective use of digital tools in teaching, the integration of information from various sources, management of one's digital footprint, and the promotion of a safe and inclusive educational setting (American Library Association [ALA], 2013). Digital literacy includes technical, cognitive, and socio-emotional skills, which are all crucial for effective teaching in the digital world of today.

The situational, context dependent circumstances that influence how teachers nurture and implement digital literacy in classroom environments are referred to in this study as **contingency**. This research acknowledges that teachers' practices are impacted by institutional resources, cultural expectations, workload pressures, school infrastructure, and

the sociocultural context in which education takes place, rather than considering digital literacy as a huge skill set. As a result, the digital literacy practices seen in Chaman's secondary schools are neither set nor uniform; rather, they result from teachers' ongoing negotiating of the opportunities and limitations inherent in their particular educational environments.

This study aims to close the knowledge gap regarding how secondary school teachers in District Chaman, Baluchistan, implement digital literacy in their classrooms. By exploring the factors that impact the adoption of digital literacy, such as professional development, socioeconomic conditions, and access to technology, the research will identify both opportunities and challenges. The findings will assist in establishing strategies to improve the integration of digital literacy in education and eventually will aid in better teaching and learning in a low resource setting.

1.1. Background and the Context of the Study

The present learning environment now requires digital literacy to learners and teachers. The skill to successfully utilise digital resources and devices produces digital literacy and is required as a condition of successful life in the digitalized world. It is particularly topical when it comes to the level of secondary, where the teacher is fundamentally supposed to help students to get ready to the challenges of the future with the introduction of digital skills into their curriculums.

The study of digital literacy practices among teachers in secondary schools of District Chaman offers an exclusive context. The different socioeconomic status, different access points to technology, and different opportunities to professional growth characterize the area. These aspects can have a major influence on the perceived integrations, incorporations, and practices of digital literacy at the education level.

Misuse of digital resources and technology is likely to be the outcome of the socioeconomic position of Chaman district. Teachers at wealthier locations might have more access to up-to-date digital instruments and consistent internet access, while those teaching at less well-off locations might experience extreme difficulties with this. The consistency

and quality of digital knowledge at varying schools might also diminish as a direct result of this disparity and might provide a "digital boundary."

District Chaman offers teachers a very wide range of professional development opportunities. Comfort and familiarity with digital technologies on the part of teachers can also be supplemented with training offered available for their use and training programs and seminars on digital literacy. Teachers may have it more difficult, however, if there are few chances for digital literacy or if they are not made aware of them.

1.2. Problem Statement

In today's learning environment, with digital tools and learning resources inevitably becoming central, teaching digital literacy as part of the curriculum at the secondary school level has never been as imperative as it stands now. Teachers at the secondary school at District Chaman, Baluchistan, have certain odds and challenges with adopting and practicing digital literacy methods of teaching with digital media. Usage of digital literacy at the class level depends heavily on numerous aspects, such as the application of technology, professional development, and socioeconomic status. Although it seems that digital literacy is becoming a priority, little has been found with its implications on how these aspects influence the teaching process of teachers operating in this context using digital media.

The purpose of the study is to scrutinize the differences in the digital practises of the teachers of the District Chaman secondary school and the issues that they encounter and the enabling factors that may enhance their digital literacy skills. By examining the variables, the research aims to provide insights and recommendations to strengthen digital learning in high schools that would ultimately translate to better academic outcomes and equip students with essential digital skills.

1.3. Objectives of the Study

The following were objectives of the study:

- 1 To measure the contingency level of digital literacy among the secondary school teachers in District Chaman Baluchistan.
- 2 To evaluate the effectiveness of current teacher training programs in promoting digital literacy among secondary school teachers in District Chaman, Baluchistan.
- 3 To study perceptions of teachers towards digital literacy and its significance for teaching at the secondary level in District Chaman, Baluchistan.

1.4. Research Questions

The followings were research questions of the study:

- 1 What is the contingency level of digital literacy among secondary school teachers in District Chaman Baluchistan?
- 2 Which digital materials and tools are most often used by secondary school teachers in District Chaman Baluchistan?
- 3 Which particular digital literacy skills are given to secondary school teachers in training programs in District Chaman Baluchistan?
- 4 Which digital tools and technologies are most commonly used by secondary school teachers in their methods of teaching in District Chaman, Baluchistan?

1.5. Significance of Study

This study is relevant to the current state of education because it focuses on District Chaman Baluchistan, a region that is frequently characterized by distinctive socioeconomic and cultural dynamics. By examining how digital literacy is perceived, adopted, and integrated into educational practices, this study fills a space in the literature by examining the specific practices and challenges faced by secondary school teachers in this area. Additionally, by examining this locality, the study addresses a gap where regional and contextual factors influencing digital literacy have been underexplored. Finally, the findings of this study can be used to inform policy makers, educational institutions, and teachers.

The implications of the research are wide. It will identify the particular issues and facilitators of secondary school teacher-level digital literacy in District Chaman Baluchistan first and will provide the foundation of interventions. The education policy makers can adopt these results in formulating and constructing more efficient professional development plans that will address the local teachers' unique challenges. Second, maintaining updating training and digital infrastructural costs in accordance with the real needs of teachers, the results of the research may help to arrange resources. It will bring about more student achievement and teacher competence and will also bring about more effective expenditure of the funds. Finally, the research can be used as a template of such studies by other regions and will lead to more attention to the region to become more digitally literate to educate.

1.6. Contribution to Knowledge

There are many substantive contributions to the body of literature which are available in this research. It is the fine-grained analysis of contingent factors that can affect the digital literacy practises that are complementary to our knowledge of the impact of context on the utilisation of educational technology. The study represents an overt perspective of what has been mostly missing in the body of literature in the context of teachers in the secondary schools of the District of Chaman, Baluchistan. Besides this, the study also offers new models or frameworks through which digital literacy performances can be analysed within related contexts. In addition to that it generates empirical data that can be subjected to comparison analysis and this further enhances our understanding of digital literacy where it concerns divergent education contexts. Finally, the research results can inform other studies and specify new rules to advance and refine the approaches to the study of digital literacy throughout the classes.

1.7. Delimitations of the Study

The study is delimited to the digital literacy practices of secondary school teachers in District Chaman, Baluchistan, focusing on their use of commonly employed digital tools such as computers, mobile phones, projectors, MS Office applications, WhatsApp, YouTube, and other internet-based educational resources. For the purpose of this research, digital literacy is defined as teachers' ability to effectively utilize digital resources and technologies

to support teaching, communication, lesson planning, assessment, and professional development. The investigation is geographically confined to District Chaman, which was specifically selected as the study site due to practical and contextual considerations, including administrative access and permissions, the availability of teachers, feasibility and security factors, and the researcher's familiarity with the area. While Quetta Division provides the broader geographical context, focusing on Chaman allowed for a manageable and concentrated study while ensuring relevance to the wider regional educational setting.

A mixed-methods approach was employed, combining quantitative methods, such as surveys and statistical analysis of digital tool usage, with qualitative methods, including classroom observations and semi-structured interviews. Data collection was conducted during a defined academic period, spanning September 2024 to September 2025, and the analysis is limited to information obtained within this timeframe.

1.8. Operational Definitions

The following operational definitions are applied.

Digital Literacy Practices:

Digital literacy practices encompass the specific activities, behaviours, and skills that secondary school teachers demonstrate when engaging with digital tools and resources in their professional environments. These practices extend beyond basic device operation to include the purposeful use of digital technologies for lesson planning, instructional delivery, communication, classroom management, assessment, and ongoing professional growth. They involve navigating online platforms, utilising educational software, accessing internet-based materials, and integrating digital content strategically to support student learning. In essence, digital literacy practices reflect how teachers meaningfully adopt and adapt digital instruments to enhance both their pedagogical effectiveness and their overall professional responsibilities.

Digital Literacy Tools:

Digital literacy tools are digital or electronic resources, applications, platforms, and devices that allow individuals to obtain, build, and practice digital literacy proficiency. The devices support many different types of competences including information handling, communication, collaboration, creativity, safety, and resolving problems. Examples include productivity and collaboration platforms such as Microsoft Office Suite, Google Workspace, Slack, and Zoom, which allow for teamwork and effective task navigation. Learning Management Systems such as Moodle, Canvas, Blackboard, and Google Classroom are utilized extensively in learning environments as part of teaching and learning processes. Content creation software such as Canva, Adobe Creative Cloud, and iMovie enable users to author multimedia materials, whereas resources for research such as Google Scholar, ResearchGate, and Mendeley facilitate accessing and manipulating scholarly material. Communication networks such as WhatsApp, Facebook, X (Twitter), and LinkedIn improve communication and digital interaction. Coding software such as Scratch, Code.org, Python, and GitHub enhance computational thinking, whereas sources of cybersecurity such as antivirus software, password managers, and two-factor authentication software promote safe digital use. Smartphone learning apps such as Duolingo, Quizlet, and Khan Academy enable individuals to experience learning on their own, whereas AI-enabled software such as ChatGPT, Grammarly, and Turnitin give adaptive support and support key digital literacy. Altogether, these devices not only nurture creativity and collaboration but also enable learners and educators to engage responsibly with the digital environment.

1.9. Theoretical framework

Theoretical framework for conducting the study of digital literacy practices of teachers of secondary schools of District Chaman, Baluchistan, used some of the leading ideas and theories:

Digital Literacy Global Framework (DLGF): The DLGF, formed by UNESCO, is a thorough guidebook for understanding and advancing digital literacy in a variety of settings. It may be tailored to different geographical and cultural circumstances and is intended for representatives, teachers, and students. UNESCO. (2018).

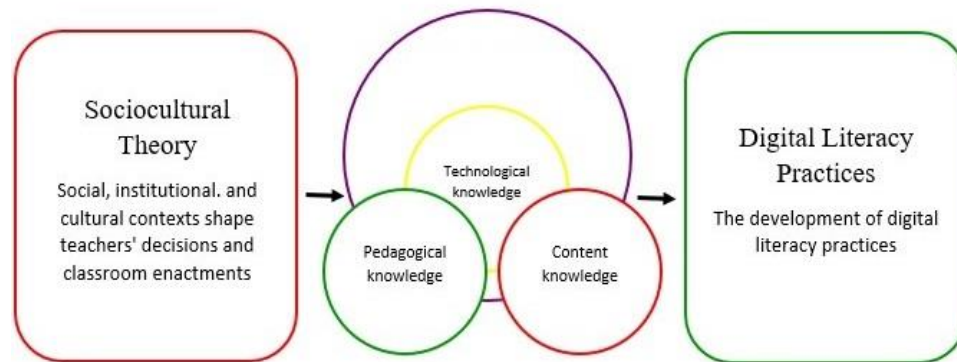
Digital Literacy Theories: The initial understanding of digital literacy will be informed by theories such as Gilster's (1997) definition of digital literacy, which includes the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers. Additionally, the framework will consider Eshet-Alkalai's (2004) multi-literacies approach, which views digital literacy as comprising photo-visual, reproduction, branching, information, and socio-emotional literacies.

Technological Pedagogical Content Knowledge (TPACK): The TPACK framework (Mishra and Koehler, 2006) will be used to explore how teachers integrate technology into their pedagogy and content knowledge. This framework helps in understanding the complex interplay between technology, pedagogy, and content in teaching practices.

1.10. Conceptual Framework

The conceptual framework of the study explains how teachers' digital literacy practices are contingent and context-dependent by combining sociocultural theory with the TPACK model. Sociocultural theory underscores how teachers' decisions and classroom enactments are shaped by social, institutional, and cultural contexts, while TPACK emphasizes the technological, pedagogical, and content knowledge they require to use technology effectively. The interaction of teachers' professional expertise with the particular conditions of their classrooms such as community expectations, leadership support, ICT accessibility, and the general learning environment leads to the development of digital literacy practices. The study can scrutinize not only what teachers know but also how and why they modify their knowledge in response to possibilities and limitations in the given context thanks to this integrated method.

Teachers' digital literacy practices are contingent and context-dependent by combining Sociocultural Theory with the TPACK model



Exploring Digital Literacy Practices of Secondary School Teachers of District Chaman, Baluchistan lays out the study question, purpose, scope, and guiding structure in this chapter. It contends that there are powerful disconnects between teacher practice and policy ambitions for digital use due to unequal access to devices, networking, and professional development (Khan & Malik, 2023; Siddiqui & Ullah, 2021), which are exacerbated by gendered and cultural environments (Farooq & Tariq, 2020) and post-COVID evolutions (Bond, 2020; Trust & Whalen, 2020). Examining teacher and school descriptive variables differing from behaviours, identifying school-level enablers and inhibitors, and gauging teachers' digital literacy on key areas of information handling, content creation, communications, safety, and problem-solving are the study intentions (Vuorikari et al., 2016).

A conceptual framework connects teacher competences to contextual elements—language, culture, equity, and post-pandemic transitions—and enabling environments, including leadership, professional development, policy, and infrastructure (Mishra & Koehler, 2006; Tondeur et al., 2018). The chapter delivers operational definitions of important terms, specific delimitations and restrictions (particularly the use of self-report data and limited generalizability outside of District Chaman), and targeted research questions and testable hypotheses for quantitative components. The following ethical protections are outlined: confidentiality, secure data processing, and freely informed consent (Creswell & Creswell, 2018).

The importance of the study is explained in three areas: scholarly contributing contextualized, post-pandemic insights to Pakistan's digital literacy literature (Khan et al., 2021); policy providing localized evidence for provincial planners (UNESCO, 2018); and practical informing targeted professional development and school resourcing (Gudmundsdottir & Hatlevik, 2018). The chapter concludes by outlining the thesis framework and preparing the reader for Chapter 2, which summarizes pertinent literature and establishes the study's theoretical and empirical foundations.

CHAPTER 2

LITERATURE REVIEW

Digital literacy refers to the ability to access, evaluate, use, create, and communicate information through digital technologies. It includes technical, cognitive, and social skills (Ng, 2020) and has grown from basic computer literacy to a broader concept involving media literacy, digital communication, collaboration, critical thinking, and ethical use (Bawden & Robinson, 2022). With the rise of Web 2.0, mobile technologies, and artificial intelligence, digital literacy demands continuous learning and adaptability (Reddy et al., 2021).

The concept of contingency highlights the fact that digital literacy cannot be comprehended in isolation from the situations in which it is employed. A complicated interaction between institutional support, device access, training possibilities, classroom settings, linguistic issues, and socioeconomic realities shapes teachers' digital practices. Digital literacy may emerge in unplanned or adaptive ways in schools with unstable or inadequate infrastructure, while more formal forms of technology integration may be supported in schools with greater resources.

In this study, operationalizing contingency entails examining how and why educators select particular digital activities in specific situations. It acknowledges that educators actively adapt to what is feasible in their surroundings rather than merely lacking the necessary skills. As a result, digital literacy is viewed as a dynamic, context-responsive activity that is influenced by local realities rather than as a static ability. This perspective aligns with sociocultural understandings of learning, which argue that knowledge and practice emerge through interaction with contextual and cultural conditions rather than existing as universal or decontextualized abilities.

In the context of secondary education, digital literacy involves not only technical competence but also pedagogical integration of technology into curricula. National policies

such as Pakistan's *Digital Pakistan Vision* aim to strengthen digital skills across areas, including education. However, infrastructure deficits, limited professional development opportunities, and socioeconomic disparities hinder progress. Globally, frameworks such as UNESCO's ICT Competency Framework for Teachers emphasize comprehensive digital literacy training to prepare educators for contemporary learning environments.

2.1. Significance of Digital Literacy

Information and communication technologies literacy has been adopted globally as one of the cores 21st-century capabilities for knowledge society membership (UNESCO, 2021). It provides for democratic participation, employment, and lifelong learning. A few countries have also made digital literacy central to their national education policies. In Pakistan, the National Education Policy Framework and the Digital Pakistan Policy make this adoption of digital means and training at all educational levels central for socioeconomic development (Government of Pakistan, 2020).

2.2. Digital Literacy at Secondary level

Digital literacy is required for the preparation of tertiary education learners from secondary school, for entry into the workforce, and for active participation as citizens. It enables learners to use credible sources, navigate digital spaces, and participate in group activities of learning (Alqurashi, 2020). Teachers play the crucial role of imbuing digital literacy in the learning process through appropriate resources and pedagogy. The COVID-19 pandemic threw the spotlight on the preparation of teacher and student with digital skills for e-learning and hybrid learning environments (Trust & Whalen, 2021), especially for underserved populations as the District Chaman, Baluchistan (Qureshi & Sajjad, 2022).

2.3. Theoretical Frameworks

These are the current theoretical models which direct the study design, variables, and data analysis of District Chaman teachers' digital literacy.

2.3.1. Sociocultural Theory

Darling-Hammond et al. (2020) and Zhang and Pang (2022) emphasize that learning draws significantly on social communication and the cultural assets of a community. This line of argument indicates that knowledge is not internalized as part of objective isolation, but as active engagement with communal social and cultural practices. In the digital literacy context, their work also indicates how community participation, linguistic practices, and culturally constructed norms play a central role in defining how individuals' access and use technology. These factors are prioritised higher in less developed regions like Chaman district because there is a lower number of infrastructures, socioeconomic differences and local conventions affecting the ability of teachers and learners to adopt and use digital instruments in their teaching practises.

2.3.2. Technological Pedagogical Content Knowledge (TPACK)

Koehler et al. (2020) and Yeh et al. (2021) describe Technological Pedagogical Content Knowledge (TPACK) framework as an integration of technology, pedagogy, and subject knowledge, and indicate that each of the three areas is vital in teaching successfully using digital instruments. The framework emphasises that effective technology-based teaching is not only connected with the knowledge of the use of digital instruments but the connexion between them and pedagogic strategies, as well as disciplinary materials. In even the resource-scarce settings, the educator with strong TPACK proficiency can creatively adapt, select appropriate digital tools and modify their use to create learning successes. That is why TPACK is particularly applicable to such spheres as District Chaman where educators must get as many pedagogic benefits as possible with limited technological resources.

2.3.3. Digital Literacy Theory

Rowsell et al. (2020) and Mills and Stornaiuolo (2022) insist that digital literacy cannot be simply thought of as gaining technical skill but as collections of communicative, cultural, and critical practises. Their argument also extends the idea of digital literacy under the guise that students use technology in various social, cultural and linguistic contexts. In

this respect, their argument has the need of educators to go beyond functional training of skills and achieve critical consciousness, local responsiveness, and multimodal communication in digital spaces. A long-term perspective on digital literacy in learning spaces, especially those of emerging localities like District Chaman, can help teachers to support adaptation of technology use that respects local identities, languages, and local knowledge resources and creates more equitable and inclusive learning opportunities.

2.3.4. Constructivism in Digital Practices

Ertmer and Newby (2020) and Almarzooq et al. (2021) define the constructivist theory as the experience-oriented learning process in which learners build knowledge through communication, reflection, and problem solving. The constructivist theory in the context of digital learning is concerned with the creation of the learner-centred environment to enable the exploration and collaboration. Digital tools such as online discussion forums, collaborative spaces, simulations, and inquiry problems have a lot to do with constructivist perspectives, as they allow learners to mutually construct meaning and apply knowledge to practise. Constructivist practises with additions of digital media in resource-scarce settings like District Chaman may allow teachers to empower creativity, critical thinking, and peer learning regardless of infrastructural limitations.

2.4. Teachers' Digital Competence

This part defines and delimit the boundaries of the digital competence of teachers, outlines the key skills, dispositions, and practises that make success in integrating technology into a secondary school learning environment possible.

2.4.1. Current Teacher Training Programs

Current teacher training initiatives in Pakistan increasingly focus on strengthening the digital skills of secondary school teachers. Institutions such as PITE and QAED provide short-term ICT workshops, digital literacy orientations, and school-based capacity-building programs, including ICT in Education Training, the Digital Skills Enhancement Program, and Teachers' Online Professional Development (TOPD) modules for enhancing the digital literacy practices of secondary school teachers serving in public sector institutions. National

initiatives such as the Digital Learning and Skills Enrichment Initiative (DLSEI) and e-Teacher Training Modules further support secondary school teachers through accessible online courses covering essential digital competencies. Although these programs vary in reach and consistency, particularly in underdeveloped regions like Chaman, they offer an important foundation for understanding secondary school teachers' existing exposure to digital training within the broader professional development environment.

2.4.2. Core Digital Competence

Digital literacy is usually described to have three predominant dimensions ICT skills, media literacy, and efficient digital communication (Livingstone et al., 2021; Gudmundsdottir and Hatlevik, 2020). The use of ICT competencies equips teachers to design lesson plans, track the students' data, and conduct online evaluations, thereby streamlining the teaching process. Media literacy is concerned with how to critically evaluate information on the internet to ensure that the teachers and learners become aware of reputable sources, recognising bias, and addressing misinformation. They are complemented by the fruitful digital communication that allows productive cooperation; thus, teachers can communicate with students, colleagues, and communities of education through the digital space. In environments with limited access to digital infrastructure such as District Chaman, it is particularly critical to upgrade these capabilities so that they positively increase teaching quality and help students gain critical consciousness.

2.4.3. Professional vs. Personal Competence

Professional and personal digital competence has different but complementary roles in the application of technology by teachers (Instefjord & Munthe, 2020; Tondeur et al., 2021). Professional digital competence is how teachers can embed technology into pedagogic procedures, assessment in the classroom, and ongoing professional development so that digital tools enhance teaching and learning outcomes. In contrast, personal digital competence encompasses day-to-day applications of technology like communication, social interactions, and entertainment. Most teachers are adept at using personal technology, but there is any kind of drift when they can relate such knowledge to professional contexts. To seal this divide, formal professional training, sustained institutional support, and having

relevant digital resources, are required. In less established educational environments such as District Chaman, both forms of competence should be developed to allow teachers to move beyond technology use as a convenience and develop the ability to engage in long-term and pedagogically meaningful digital practises.

2.5. Pedagogical Use of Digital Tools

In this section, the development, implementation, and assessment of learning activities using digital resources are discussed in terms of classroom instruction, student learning, and evaluations strategies.

2.5.1. Interactive Tools

Smart boards, Google Classroom, Microsoft Teams, and other learning management systems (LMSs) are essential in changing the teaching and learning processes through digital platforms and tools (Alvarez, 2020; Trust and Whalen, 2020). These technologies influence the delivery of lessons by enabling the teacher to add multimedia materials, interactive exercises, and real time assessment in classroom learning. They also facilitate collaboration whereby students can collaborate with one another by sharing their documents, online discussions as well as group projects regardless of their locations. Also, LMSs facilitate customised education by use of adaptive tools, progress monitoring, and differentiated course materials that meet the diverse needs of learners. In the case of resource-deprived regions such as the District of Chaman, the implementation of such tools has the potential to both develop student interest and teacher creativity, provided that the infrastructural and training problems can be addressed.

2.5.2. Impact on Student Engagement and Achievement

Digital tools well integrated have the potential to build student motivation, broaden conceptual understanding, and enhance general academic performance (Bond, 2020; Martin & Bolliger, 2020). These advantages do not derive from technology presence but from how well it is integrated into pedagogical practice. Effective integration asks teachers to create activities that map digital tools onto learning objectives, engage students, and invite active engagement. Technology can easily be inappropriately used or underutilised unless it is met

with a keen pedagogic mind, which offers little or no learning value. In such places as District Chaman, where access to digital resources is already undermined, pedagogical intentionality is more crucial to make sure that the available technology is exploited to its full capacity in providing quality learning results.

2.6. Digital Content Creation

Here, we are talking about the practises and competencies of teachers in designing, modifying and organising digital learning materials that encompass multimedia materials, lesson plans and assessment tools.

2.6.1. Multimedia in Teaching

Videos, blogs, and online tests make a significant contribution to supplementing understanding, thinking, and evaluation in learning spaces (Koumi, 2020; Panigrahi et al., 2021). Videos can be described using multimodal description which offers to other learner styles and allows the student to review complex ideas at the convenience of their own time. Blogs are conducive to thinking and critical thinking by enhancing students to share ideas, engage in dialogue and build digital writing skills. Conversely, online quizzes provide real time feedback, formative assessment, and self-directed learning paths that encourage self-discovery of strengths and weaknesses. These tools can bring a radical change in resource-constrained educational settings such as District Chaman by facilitating interactive, flexible, and student-centred forms of digital literacy development.

2.6.2. Teachers as Content Creators

One of the shifts in instructional practise is the fact that instructors are increasingly creating customised digital content in their instruction, moving to products that are sensitive to the individual needs and contexts of learners (Castaneda and Williamson, 2021; Rapanta et al., 2020). Teachers can offer increased personalization by developing their own digital materials and then mapping content down to the stage of learning, interests, and individual progress of learners. Such practises will also enhance culture appropriateness with the help of local languages, examples and values, which improve meaningfulness and inclusiveness of online learning. In less developed regions such as the District of Chaman where

commercially produced digital content is culturally inapplicable to their surroundings, teacher created materials are particularly vital in bridging the cultural gap so that a justifiable opportunity to pursue quality education can be achieved.

2.7. Digital Communication Practices

This section discusses how teachers use online platforms and technologies in communications, collaborations, and information sharing with the students, colleagues, and the wider educational society.

2.7.1. Communication Platforms

The communication tools such as email, messaging applications, and learning management system (LMS) are essential in facilitating communication in learning settings (Hasan and Khan, 2020; Trust and Whalen, 2020). Formal communication, such as official announcements, resource sharing, and feedback, is enabled by email, and real-time and informal fast-updates and instant-support methods are made available by messaging applications. LMS systems unify the above functions within a single system, and offer discussion boards, chat functionality, and notification tools which constitute synchronous and asynchronous communication. Collectively, these tools do not only help to facilitate administrative effectiveness, but also the pedagogical effectiveness, through collaboration, timely response, and community creation between the teachers and learners. In settings such as in District Chaman where traditional means of communication may be limited, the express usage of such online platforms can be used to cover the gaps and increase attendance and the degree of integration in the learning process.

2.7.2. Collaboration and Feedback

Jamboard, Padlet, and Google Docs are collaborative digital platforms full of possibilities to interact instantly and build knowledge (Cutri et al., 2020; Moorhouse and Kohnke, 2021). Such platforms allow the contributions of several users at once, creating content collaboratively, learning with peers, and jointly solving a problem. Besides collaboration, reflective learning here is facilitated by the incorporation of feedback mechanisms in these tools, which allow instant and focused teacher comments as well as

student self-reflection and peer review. These practise modes provoke learners to work with their ideas, increase critical thinking, and learn to communicate online. These resources offer flexible and convenient access to the creation of student engagement and facilitation of learner-centred pedagogies in resource-constrained settings such as District Chaman, where resources to facilitate face-to-face collaborative learning might be limited.

2.8. Integration of Mobile Learning into Digital Literacy Practice

The use of mobile learning has greatly impacted digital literacy practices among teachers in secondary schools. Mobile technologies provide convenience and flexibility, making it easier for teachers to integrate digital tools into their teaching even in remote areas like District Chaman, Baluchistan. Current research points out that mobile learning enhances teacher participation, facilitates individualized instruction, and promotes ongoing professional development in digital skills (Almaiah, Al-Khasawneh, & Althunibat, 2021). This is particularly important in areas with sparse traditional ICT infrastructure.

2.9. Legislative Constraints

Legislative and policy frameworks shape how digital literacy is applied in schools. In Pakistan, educational legislation often lacks specific, actionable guidelines for integrating digital tools into daily teaching practices (Shafique & Mahmood, 2021). This creates inconsistencies in application across regions. Policies may exist, but without clear operational plans, their impact remains limited. Funding allocation is also a critical issue. Without dedicated budgets, technology adoption becomes inconsistent and unsustainable. Furthermore, policy delays slow the pace of reform, leaving schools without timely guidance for modernizing teaching methods. In rural areas such as District Chaman, bureaucratic hurdles further complicate implementation.

2.10. Digital Literacy in Education

Digital literacy in education is the capacity to incorporate digital tools into teaching and learning activities, facilitated or disrupted by motivational, infrastructural, administrative, and policy factors. The subsequent subsections describe the chief aspects of digital literacy in education according to the thematic framework.

2.11. Teacher Motivation for Digital Tools

Teacher motivation is an imperative facilitator of effective technology incorporation. Innovative techniques are embraced by motivated teachers, multimedia tools are integrated, and interactive exercises are planned to enhance student participation and skill acquisition. Professional development, school support, and teacher belief in the educational utility of digital tools determine motivation. Conversely, demotivation because of bad training, inadequate facilities, or frequent technology breakdowns typically amount to non-existent or superficial technology uses (Ng, 2012; Ilomaki et al., 2016).

2.11.1. Barriers to Digital Integration

Digital integration in schools is typically hampered by the infrastructural deficiencies, such as the lack of electricity, the unreliability of the internet connexion, and the unavailability of the devices. Other challenges include a shortage of technical support, the ability to train, and localised content, particularly of rural locality. These problems reduce the motivation of the teachers to use digital practises, which also confirms the perception that digital literacy is difficult to sustain in under-endowed settings (Reddy et al., 2020; UNESCO, 2018).

2.11.2. Student Response to Digital Tools

The use of technology by teachers on a long-term basis is strongly influenced by the involvement and response of students to the digital tools. Online tests, collaboration tools, and educational videos are interactive tools that have been found to increase motivation and participation of students. Positive reactions form a self-reinforcing adoption cycle, while negative reactions such as distraction and difficulty in using tools dissuade educators from using digital tools (Spante et al., 2018; Ng, 2012).

2.11.3. Informal Assessment of Digital Skills (Hybrid)

Informal testing enables instructors to measure students' digital skills in real-life classroom and hybrid environments. Rather than executing solely standardized testing, instructors may evaluate through projects, online assignments, and reflective exercises. Such

strategies yield information on students' hands-on skills like information searching, content creation, and collaboration and inform short-term interventions for enhancement (Siddiq et al., 2017).

2.11.4. Limited Training Opportunities

Teachers generally expect limited exposure to formal professional development in digital literacy. Sporadic workshops concentrating on technical functions without connecting them to pedagogy are not enough. Successful digital literacy education needs ongoing assistance, mentoring, and practice-inseminated learning. These are scarce in rural environments, and educators rely on self-directed or peer-organized learning communities (Ilomäki et al., 2016; UNESCO, 2018).

2.11.5. Future Vision for Digital Literacy

The digital literacy future emphasizes the preparation of both teachers and students with flexible skills that match changing technologies. A future-oriented vision includes integrating digital capacities in curriculum, assessment, and teacher quality standards. It emphasizes equity so that all learners, irrespective of location, gain access to relevant digital experiences. This long-term vision necessitates resilience planning to maintain learning during disruption (UNESCO, 2018; Reddy et al., 2020).

2.12. Administrative Support and Limitations

Administrative leadership determines the enabling environment for digital integration. Good administrative support involves making time for training, offering maintenance systems, and incentivizing innovative practices. But where support is weak as a result of poor funding, poor planning, or administrative delays, teachers find it difficult to maintain digital practices. Simple governance systems, for instance, classroom norms and device management systems, have the potential to significantly lower barriers (Reddy et al., 2020).

2.12.1. Weak Policy Implementation in Rural Areas

National digital literacy policies usually fail to meet their desired effect within rural schools because of weak implementation, uneven allocation of resources, and absence of

monitoring. Rural teachers often face the brunt of improvising with minimal resources and guidance. Successful implementation demands localized approaches, recurring budgets, and regional training facilities to advance equal access and meaningful integration of digital tools (UNESCO, 2018; Reddy et al., 2020).

2.13. Teacher-Driven Innovation

Educators usually act as the connecting link between practice and policy. Teachers themselves try out new tools independently to interact with students (Ertmer & Ottenbreit-Leftwich, 2020). They adapt lesson plans to include multimedia, simulations, and interactive activities. Such innovations help students develop critical thinking and problem-solving skills. Teachers in under-resourced areas often repurpose available technology creatively. This includes using mobile devices for quizzes, or free software for content creation. Teacher-driven innovation nurtures a sense of ownership and professional pride. However, without formal recognition or incentives, sustaining these practices can be challenging.

2.14. Student-Centered Learning Approaches

Digital literacy enables a shift from teacher-led instruction to student-centered learning (Ng, 2012). In this model, students take an active role in exploring content, collaborating with peers, and applying knowledge in real-world contexts. Tools such as learning management systems, discussion forums, and project-based tasks encourage active engagement. Digital tools also allow for differentiation, catering to varied learning styles and abilities. In District Chaman, these approaches can support address gaps in student motivation and participation. However, they require teachers to be confident in both technology and pedagogy. Without adequate training, the transition remains incomplete.

2.15. Infrastructure Limitations in Rural Settings

Infrastructure remains one of the most pressing challenges in rural schools (Asadullah & Malhi, 2020). Limited internet connectivity, frequent power outages, and outdated computer labs restrict teachers' ability to integrate digital tools. Many schools rely on shared devices, making access inconsistent. The lack of maintenance services further worsens the problem. In some areas, even basic equipment such as projectors or printers is unavailable.

These constraints not only disturb teaching quality but also demotivate teachers from adopting new practices. Long-term solutions are dependent on investment in physical infrastructure and ongoing technical support.

2.16. Digital Infrastructure and Rural–Urban Disparities

The standard of internet connection, hardware, and software has a direct impact on digital literacy performance in schools. Regular access to up-to-date devices and stable networks allows teachers to apply innovative pedagogies and students to take full advantage of digital resources (Kim & Lee, 2021). In contrast, aged technology and poor connections constrain innovation.

There is a considerable gap between rural and urban schools. Urban schools commonly have quicker internet, newer devices, and more software options, whereas rural schools have slow networks, outdated equipment, and fewer platforms for instruction (Ndlovu & Shava, 2022). The gaps minimize rural teachers' ability to incorporate digital technology and limit students' development of skills (Okeke et al., 2021). High-level investment and balanced policy interventions are required to bridge the gap.

2.17. Key Challenges in Implementing Digital Literacy

Teachers can be resistant to using digital tools if they have low confidence, fear of technology, heavy workload, or lack of clarity about benefits (Ertmer & Ottenbreit-Leftwich, 2020). Lacking sufficient support, teachers accustomed to conventional strategies are not easily willing to transform. Overcoming this involves professional development, leadership support, and school culture supporting innovation (Smith & Green, 2021).

Infrastructure constraints, lack of training, and unclear policies also slow progress. Most schools still have outdated devices, unsteady internet, and applicable software (Hew et al., 2021). Weak or absent guidelines on digital citizenship add to the problem, while inconsistent training prevents teachers from building essential skills (Zhang & Dang, 2020). Sustainable solutions must combine infrastructure investment, ongoing training, and clear regulations.

2.18. Opportunities and Benefits of Digital Literacy

Digital literacy supports personalized learning by enabling teachers to adapt lessons, pacing, and content to each student. Adaptive learning systems use data analytics to identify strengths and weaknesses, allowing targeted instruction that boosts engagement and performance (Chen et al., 2021; Walkington, 2020).

It also enhances communication and collaboration. Platforms such as Learning Management Systems (LMS), messaging apps, and video conferencing break time and location barriers, enabling resource sharing and real-time feedback (Moorhouse & Wong, 2021). Collaborative digital spaces foster creativity, critical thinking, and peer learning (Kuo et al., 2020), strengthening school–community ties.

2.19. Gender Disparities and Digital Inclusion

Despite widespread technology, inequalities persist in access and use. This “second-level digital divide” involves not only device availability but also differences in skills and meaningful use (van Deursen & van Dijk, 2020; Hargittai & Hinnant, 2021).

Girls and women frequently encounter extra hurdles because of cultural expectations, stereotypes, and limited role models (UNESCO, 2021). Technology-enabled learning can be empowered through gender-sensitive policies and focused programs to enable girls and women to engage and lead actively (Hilbert, 2020). Incorporating gender into all digital literacy efforts promotes equality and inclusivity.

2.20. Digital Literacy in Underserved and Remote Areas

Rural areas such as District Chaman, Baluchistan face extreme challenges: poorly funded schools, intermittent electricity, poor connectivity, and the lack of ICT-trained teachers (Khan et al., 2021). The sociocultural, linguistic, and exposure to technology factors worsen the problem of digital exclusion (Shah et al., 2022).

There is no access to broadband, local-language content, as well as no functional computer laboratories in rural areas (Mahmood and Ahmed, 2020). National training programmes tend to exclude teachers, which also contributes to the shortage of skills

(Rehman et al., 2021). A bridge has to be established by means of inclusive policies, grassroots measures, and region-specific digital education efforts.

2.21. Role of School Leadership in promoting Digital Literacy

School administrators have a huge role to play in ensuring digital literacy. The culture of appreciating the use of technology can be established by means of vision, strategic decision-making, and support systems (Azorin et al., 2020). Their capabilities to allocate resources and make helpful decisions lead to the adoption of digital tools. Infrastructure, training, and technical support have to be accessible to teachers in order to flourish (Garcia-Penalvo & Corell, 2020). Teacher confidence and motivation increase when the leaders enthusiastically encourage digital literacy based on policy and joint planning (Garcia-Holgado et al., 2020).

Promoting innovation requires more than access to technology. Schools must create an atmosphere that encourages experimentation and creative problem-solving (Manca et al., 2021). Rewards, peer collaboration, and recognition motivate teachers to design innovative lessons. Leadership that supports risk-taking and continuous learning fosters long-term digital transformation (Tondeur et al., 2021; Voogt et al., 2022).

2.22. Government Policies and Integration of Curriculum

National policies such as the Digital Pakistan Policy aim to bridge the digital divide, recover ICT infrastructure, and strengthen technology use in schools (MoITT, 2021). These policies emphasize innovation, skills development, and connectivity, but regional differences in infrastructure and teacher readiness hinder implementation (Khan et al., 2022). Context-specific solutions are vital for rural areas like District Chaman, where needs differ from urban contexts (Sadaqat & Ali, 2023).

Integrating ICT into the curriculum ensures that technology becomes a core pedagogical tool rather than an optional add-on (Asad et al., 2021). Pakistan's curriculum has begun to acknowledge digital literacy, yet teacher preparation and classroom application remain limited (Shahbaz et al., 2020). Future-ready curricula should align with students' needs and the demands of the digital economy. Teachers also require constant resources and

support to meet ICT-focused learning goals (Jamil et al., 2023). Without such support, curriculum reforms rarely convert into classroom practice, especially in low-resource areas.

2.22.1 Role of NACTE and Other Educational Bodies

The National Accreditation Council for Teacher Education (NACTE) sets standards to ensure quality and accountability in teacher education, now including digital competency requirements (NACTE, 2021). These align with national initiatives such as Vision 2025 and Digital Pakistan, though enforcement varies regionally (Rehman & Fatima, 2022). Strengthening accreditation requirements can ensure schools both integrate digital literacy into curricula and assess its real-world application (Saleem & Nasir, 2021).

Educational bodies also influence teacher training guidelines. Post-pandemic reforms emphasize capacity building through digital training modules (Imran et al., 2022). Programs like Taleemabad and Hunarmand Pakistan, alongside initiatives from HEC and USAID, have promoted ICT skill development (HEC, 2020). However, training effectiveness depends on institutional support, regional flexibility, and alignment with classroom realities (Ali & Khalid, 2023). Short-term workshops alone cannot sustain digital capacity; continuous professional learning systems are required (Abbas et al., 2021).

2.23. Post-COVID Digital Shifts and Lessons Learned

The COVID-19 pandemic forced a rapid transition to remote teaching, exposing infrastructure weaknesses and skill gaps, particularly in areas like District Chaman, Baluchistan (Mahmood et al., 2021). Despite poor connectivity and low digital competence, teachers gained valuable experience with platforms such as Google Classroom, Zoom, and WhatsApp (Ali et al., 2020). Urban schools adapted faster, while rural schools faced greater challenges (Shah & Rehman, 2022).

Lessons from this period highlight the need for ongoing, locally tailored digital training (Nawaz & Ullah, 2022). Hybrid learning models—blending online and in-person methods—can enhance flexibility and accessibility (Khan et al., 2023). Future planning must prioritize infrastructure upgrades, equitable access, and embedding digital pedagogies

into teacher education. Sustainable progress will require funding, community engagement, and leadership willing to embrace innovation (Farid et al., 2021).

2.24. Emotional and Psychological Dimensions of Digital Literacy

The pandemic increased tech anxiety and digital fatigue among teachers. Tech anxiety—fear or stress related to technology—was most common among educators with low skills or minimal training (Nawaz et al., 2021). Another major issue was the digital exhaustion, which is caused by too much time spent on the screen, poor work-life balance, and constant accessibility (Aslam and Aftab, 2022). These pressures were increased by unstable internet and lack of technical support in under-resourced settings like District Chaman (Shahbaz & Gul, 2021). Mental health care, slow adoption of digital technology, and well-being can resolve these concerns.

Self-efficacy and motivation also drive technology adoption. Teachers who are digitally self-confident are less likely to avoid trials and errors and overcome challenges (Iqbal and Qureshi, 2020). Professional development opportunities, autonomy, institutional recognition, and supportive leadership are the considerations that influence motivation (Youseaf et al., 2023). Access to resources, peer networks, and continuous mentorship enhances morale and capabilities--particularly key in underserved communities (Rehman & Khan, 2021).

2.25. Equity and Access Challenges

Socioeconomic factors intensely influence digital literacy uptake. The economic performance of low-income neighbourhoods like District Chaman features an underdeveloped connectivity, insufficient digital devices, and low investment in ICT (Rafiq and Ahmad, 2021). More wealthy neighbourhoods have the probability of more structured digital education and the most current devices (Arif and Satti, 2022). The inequality of gender, income and geography are more likely to overlap and contribute to reinforce education inequality (Farooq & Bashir, 2023).

Language barriers and lack of accessibility for disabled teachers and learners widen the gap. Many digital resources are only in English or Urdu, excluding speakers of Pashto,

Balochi, or Brahui (Zahid & Akhtar, 2021). Similarly, limited availability of assistive technologies marginalizes those with disabilities (Naseem & Qadir, 2020). Policies must promote inclusive, locally relevant content and accessible tools to ensure digital literacy benefits all (Asghar & Habib, 2023).

2.26. Teachers' Attitudes, Beliefs, and Influence on Technology Adoption

Teachers' willingness to integrate digital technologies into their teaching is strongly shaped by their perceptions of technology. Positive attitudes—such as viewing technology as a means to enhance efficiency, pedagogical innovation, and student engagement—are strong predictors of adoption (Ahmed & Khalid, 2021). Conversely, negative perceptions rooted in fear of redundancy, irrelevance, or disruption of traditional methods often results in resistance (Iqbal & Bhatti, 2022).

In contexts like District Chaman, Baluchistan, where exposure to educational technology remains limited, insufficient contextualized training and weak support mechanisms. Perceptions are shaped by institutional culture, peer influence, prior experiences, and available resources (Younis & Shah, 2023). Building trust, showcasing local success stories, and aligning technology use with regional educational goals are essential to counter negative attitudes.

Beliefs directly affect adoption behaviour and classroom practices. Teachers confident in technology's relevance are more likely to meaningfully use tools such as online assessments, multimedia resources, and collaborative platforms (Ali et al., 2020). When perceived utility and usability align, adoption deepens; when misaligned, usage tends to be superficial. Teacher-led innovation thrives in environments with strong peer collaboration, professional development, and administrative backing (Nasir & Saeed, 2021). Institutional support and belief in technology's usefulness significantly boost effective integration, even in resource-constrained settings (Karim & Raza, 2022).

2.27. Student Engagement and Autonomy through Digital Literacy

Gamification—the integration of game elements like challenges, rewards, and progress tracking—has emerged as a powerful engagement tool, especially when used with interactive

platforms such as Kahoot! Quizizz, and Class craft (Koivisto & Hamari, 2022). These approaches foster active participation, provide instant feedback, and cater to diverse learning styles, which improves retention (Al-Azawi et al., 2021).

Interactive, gamified environments also enhance student autonomy. Learners gain greater control over their learning pace, strategies, and pathways, resulting in increased confidence and deeper engagement (Ryan & Deci, 2020). With adaptive technologies and targeted teacher support, self-directed learning becomes more effective (Ifenthaler & Schweinbenz, 2021).

2.28. Artificial Intelligence (AI) in Teaching and Learning

Artificial Intelligence (AI) technologies simplify lesson planning and grading by automating processes like scoring objective tests and creating individualized lesson plans from student performance data (Zawacki-Richter et al., 2020). This helps teachers to concentrate on innovative teaching and interacting with students, albeit with issues of trust, data protection, and training in the background (Chen et al., 2021).

Adaptive learning systems based on AI are adapted to the needs of each person in terms of content and speed within a real-time feedback and personalised environment (Khosravi et al., 2021). They can be applied to bridging the learning gap and effectively work in mixed-ability classrooms and online learning settings (Durlach and Lesgold, 2020).

2.29. Social Media and Professional Learning Networks (PLNs)

Education-oriented social media platforms, including Twitter, LinkedIn, forums, and digital platforms, enable educators to collaborate professionally and share knowledge and become more digitally literate (Trust & Horrocks, 2020). The competence and confidence are enhanced by the active role in PLNs especially in the environment with limited resources (Zhao et al., 2021).

In classroom contexts, social media use demands clear digital etiquette rules to maintain focus and foster responsible behaviour. Establishing expectations for respectful

communication and proper technology use reduces distractions and cyberbullying while promoting positive digital citizenship (Martin et al., 2022; Chen & Bryer, 2020).

2.30. Digital Assessment and Academic Integrity

Online quizzes, assignments, and multimedia assessments provide flexible, accessible, and engaging ways to measure learning progress (Kumar & Vigil, 2021). They allow real-time performance tracking, enabling instructional adjustments and personalized support (Patel et al., 2022).

Effective feedback systems—both automated and teacher-led—ensure timely guidance that supports learning momentum (Shute, 2020). Plagiarism detection tools further uphold academic integrity and encourage originality (Sutherland-Smith, 2021).

2.31. Professional Learning Communities (PLCs) and Online Collaborations

Collaborative teacher networks enhance instructional quality by promoting shared resources, strategies, and problem-solving approaches (Vangrieken et al., 2020). Continuous peer interaction fosters innovation and digital literacy, particularly in rural or diverse learning contexts (Huang & Wang, 2021).

Online platforms such as Edmodo, Google Classroom, and Microsoft Teams extend these benefits by providing spaces for planning, training, and communication, enabling teachers to adapt effectively to hybrid and remote teaching demands (Trust et al., 2021; Johnson & Brown, 2022).

2.32. Blended, Hybrid, and Flipped Learning Models

Bishop and Verleger (2020) and Io and Hew (2021) explain that flipped classrooms—where students are introduced to core content through online resources prior to class—create space for interactive, higher-order learning activities during face-to-face sessions. This approach fosters greater engagement, supports the development of critical thinking skills, and enables more personalized learning experiences as teachers can focus on addressing individual needs during class time. Likewise, Garrison and Vaughan (2021) point out the value of blended learning, the integration of online and face-to-face instruction to create

flexibility, promote collaboration, and increase accessibility—a strategy that has become of especial interest in the post-pandemic educational context. However, O’Flaherty and Phillips (2020) caution that the effectiveness of flipped and blended learning is not only rooted in the use of technology but selective curriculum design, robust digital infrastructure and teacher readiness. These models can only work when implemented in contexts such as District Chaman, where access to technology remains unequal to bring about the desired impact, but such implementation requires careful planning, creating capacities and institutional support.

2.33. Open Educational Resources (OER) and Licensing Practices

Weller et al. (2020) and Nguyen et al. (2021) emphasise that Open Educational Resources (OER) are open and adaptable educational resources, and they are significantly involved in equal access to quality education, particularly under-resourced one. In lowering cost barriers, OER enable teachers to experiment with teaching practises, experiment with new pedagogies, and support teacher-learner collaboration. Stacey et al. (2022) also notes the importance of clear licencing regimes, e.g., the Creative Commons, which offer the legal framework of reuse, redistribution, and adaptation of educational resources and guarantees the ethical and sustainable use. Hilton et al. (2020) argues that the perceived value of OER is manifested when such resources are contextualised in relation to cultural differences, language differences, and local requirements. This contextualization in places such as District Chaman enhances the motivations of learners and also ensures that the learners’ digital information is relevant to the real life of the learners and therefore learning is not only reachable but also of importance.

2.34. Language, Literacy, and Digital Competence

Garcia and Wei (2021) and Kirkpatrick (2020) point out that multilingual online content plays a critical role in supporting the inclusivity process as it reduces the language barriers in communication and interpretation and guarantees the active involvement of the linguistically diverse learners. With these resources, learners can see content on their preferred languages and this makes learning to be more inclusive and culturally responsive. These tools are particularly efficient in the case of multilingual settings like District

Chaman, when language is not to be the barrier to the realisation of digital literacy or even education.

In addition, the authors note that online reading and writing experience are now required to find successful navigation in the worlds of information of the modern era (Leu et al., 2021; Lankshear and Knobel, 2020). The advanced literacy skills are more than mere literacy since they involve critical thinking, multimodal writing and effective digital communication. These abilities will allow students to read and write various types of digital texts, practise reflective learning, and be fully involved in the educational and professional worlds. The acquisition of such skills promotes life-long learning and allows individuals to survive in the dynamic digital worlds.

2.35. Digital Literacy across Regions

Comparative works show colossal differences in regional level of digital literacy skills, which depend on social economic status, infrastructure and policy initiatives (Livingstone and Helsper, 2007). Developed nations possess well-developed online sphere and stable ICT investment that contribute to the increased competencies.

On the other hand, developing states are marred by the persistent problems, including scarce resources, low-quality teachers, and insufficient internet connectivity that undermine the adequate implementation of digital tools in the educational process (UNESCO, 2018). This gap is to be ensured by certain policies and equal distribution of resources in order to equip all teachers with the necessary training and equipment to facilitate digital literacy (Van Deursen and Van Dijk, 2014).

2.36. Current Trends in Digital Literacy

The latest directions in digital literacy training are the use of artificial intelligence (AI), adaptive learning technologies, and gamification in order to improve the engagement of students (Luckin et al., 2016). An increasing focus has been placed on computational thinking, code-writing and data literacy to equip learners with a technology-based future (Wing, 2006). In addition, educational reforms in the wake of the pandemic have increased

the pace of blended and hybrid learning, which puts more pressure on educators to constantly overhaul their digital competencies (Trust & Whalen, 2020).

2.37. Evaluation and Assessment of Digital Literacy Skills

The evaluation of digital literacy requires multi-faceted assessment frameworks that can evaluate the technical, cognitive and socio-emotional abilities (Calvani et al., 2012). Such standardised tools as the European Dig Comp framework provide benchmarks against which skills can be assessed in various settings (Vuorikari et al., 2016). However, country-specific assessment models are needed to reflect cultural and contextual specificities of the needs and realities of teachers in various settings (Martin and Grudziecki, 2006).

2.38. Lifelong Learning and Digital Literacy

Digital literacy cannot be defined as a single object; it is dynamic and follows changes in technology; so, educators must learn throughout their lives (Bawden, 2008). The professional development programmes must be continuous, reactive and in line with the new trends in technology (Redecker, 2017). Educators with a lifelong learning approach are more likely to incorporate cutting-edge digital tools and promote a culture of digital fluency in their classrooms (Ferrari, 2013).

2.39. Digital Literacy in the 21st Century

In the 21st century, digital literacy extends beyond low-level ICT capabilities to encompass critical thinking, collaboration, creativity and ethical awareness in the digital realm (Jenkins et al., 2009). No longer it is only a matter of technical expertise to operate digital devices but also the capacity to make critical judgments about information, a responsible involvement in virtual communities, and a significant contribution to the development of knowledge. Educators play a very important part in assisting the learners to cope with this increasingly complex digital world, and require them to be skilled professionals and considerate instructors (Rheingold, 2012). They are also tasked with nurturing the digital citizenship of students, enabling them to utilise the internet and other digital resources to be safe and ethical as well as make technology available to all students. Moreover, teachers must change their teaching methods to integrate new technology in a

way that enhances learning outcomes, promotes innovation and prepare students to survive in a knowledge society. Digital literacy, however, is a dynamic and adaptable skill, not only required to achieve academic success, but to learn throughout life and participate in an active digitally mediated world.

2.40. Digital Equity and Access Challenges in Rural Secondary Schools

Digital equity and access disparities are major factors that affect digital literacy practises among teachers in secondary schools of rural districts like District Chaman, Baluchistan. Low internet access, inadequate digital devices and socioeconomic realities hamper effectiveness of technology integration by the teachers. These differences are essential to eliminate as the first step to an inclusive digital literacy development and teachers will have an opportunity to make learning outcomes better due to digital tools (Warschauser, 2020).

2.41. Digital Literacy Practices for Teachers

Digital literacy of teachers involves incorporating technology in their teaching methods, efficient utilisation of tools and being able to adapt to new technologies in education. Technological Pedagogical Content Knowledge (TPACK) model emphasises the role of content, pedagogy, and technology integration in order to improve the learning outcomes (Mishra and Koehler, 2006). The attitudes of teachers towards technology, their professional development opportunities and resourcing have a significant role in determining whether they can integrate digital literacy in the classroom or not (Ertmer and Ottenbreit-Leftwich, 2010). Most contexts have training courses that help teachers gain confidence in the use of technology in planning lessons, assessing the classes, and engaging the lessons with interactive activities (Hennessy et al., 2010). However, opposition to change, lack of training, and resources shortage may become obstacles to using digital tools (Jones, 2014). The development of digital competencies in Pakistan among teachers remains uneven, and rural communities have a tendency to be poorly equipped with ICT infrastructure (Farooq et al., 2020).

2.42. Global Perspectives on Digital Literacy

The digital literacy standard varies significantly between developed and developing nations, based on infrastructure, policy, and the socio-economic conditions (UNESCO, 2018). In this regard, developed ICT nations incorporate digital literacy in the national curricula of schools and provide students and educators with all possible resources (Voogt and Roblin, 2012). On the contrary, developing nations face challenges such as poor internet access, lack of hardware, and the lack of skilled teachers (Trucano, 2015). The access to ICT facilities in urban districts in Pakistan is higher whereas rural districts like District Chaman have an acute digital divide (Khan et al., 2021). The gap is addressed by efforts by the government and other non-government agencies to provide equipment, train teachers, and curriculum guidance (Ministry of Education, 2021). These disparities need to be mitigated in order to get fair access to digital literacy education.

2.43. Digital Literacy in District Chaman, Baluchistan

The frontier town of District Chaman, Baluchistan province has its own special problems in developing digital literacy. Poor internet access, unstable electricity and lack of ICT facilities in schools is one of the problems that hamper the use of technology in classes. There is also the challenge of language as majority of the teachers and students speak Pashto whereas the computerised materials are in Urdu or English. Access is further hindered by gender differentials in which female teachers and students are usually constrained socially and culturally to use technology. The solutions to these problems cannot be the same like the generation of localised digital data, the development of solar-powered ICT laboratories, or encouragement of community-based teacher-training opportunities to make the digital literacy adoption sustainable.

2.43.1 Training & Professional Development

Recent initiatives aimed at strengthening teachers' digital competencies have played a significant role in shaping digital literacy practices in District Chaman. Programs offered by the Provincial Institute of Teacher Education (PITE) provide ICT-focused training designed to enhance teachers' capacity to integrate technology into classroom instruction. Similarly,

Continuous Professional Development (CPD) programs equip teachers with updated pedagogical and technological skills, ensuring they remain responsive to evolving digital demands. Government and NGO-led initiatives such as Digital Skills for Educators further support teachers by offering targeted training on digital tools, online platforms, and instructional technologies. In addition, the online trainings introduced during and after the COVID-19 pandemic expanded teachers' exposure to virtual learning environments, video-based instruction, and digital resource management. Collectively, these programs contribute substantially to competency building by improving teachers' confidence, enhancing their technological proficiency, and enabling more effective and innovative classroom practices.

2.44. Context of Digital Literacy in District Chaman

District Chaman, the town of the border between Pakistan and Afghanistan, is the strategic but underdeveloped town of northern Baluchistan. Its geographical isolation, socioeconomic poverty, and political instability influence overall education provision and digital literacy specifically. Although there has been an increase in the internet penetration rates throughout Pakistan, rural District Chaman is far behind due to the absence of adequate infrastructure, abject poverty, and poor institutional support (Shah and Khan, 2020). These issues make the process of incorporating ICT into the school more complex and students and teachers find themselves with less exposure to modern digital practise.

2.44.1. Infrastructure and Connectivity Gaps

Reliable ICT infrastructure is a cornerstone for digital literacy, but in District Chaman, it remains inadequate. Many schools lack computer labs, and where labs exist, they are often non-functional due to lack of maintenance and frequent electricity outages. Broadband internet connectivity is weak, and mobile data services are costly and inconsistent. These limitations discourage teachers from adopting digital pedagogy. To overcome such barriers, solar-powered ICT labs, mini-grids, and offline educational servers such as RACHEL (Remote Area Community Hotspot for Education and Learning) have been suggested as sustainable alternatives (Baloch, 2021).

2.44.2. Language and Cultural Barriers

Language is a critical but often overlooked aspect of digital literacy. The dominant language in District Chaman is Pashto, whereas most digital learning resources are available in English or Urdu. This mismatch restricts both teachers' and students' ability to fully benefit from online platforms and e-learning resources (Yousafzai, 2019). Additionally, cultural norms may discourage the use of digital media perceived as foreign or irrelevant. Developing Pashto-medium apps, bilingual glossaries, and culturally relevant learning materials can help bridge the gap. where teachers and students switch between Pashto and Urdu/English, can also facilitate better understanding and digital engagement.

2.44.3. Gender Disparities in ICT Access

Digital literacy in District Chaman is also shaped by gender dynamics. Female teachers and students face multiple layers of exclusion—ranging from restrictive social norms to limited mobility and lack of safe access to digital spaces (Ali & Jalal, 2018). Studies on South Asia highlight that woman are 15–20% less likely to use mobile internet compared to men. In District Chaman, these disparities are even more pronounced. Introducing women-only digital training sessions, mentorship programs for female teachers, and safe ICT labs within schools can create equitable opportunities. Without addressing gender barriers, digital literacy initiatives risk reinforcing existing inequalities rather than reducing them.

2.44.4. Teacher Competence and Training Needs

Teachers are at the heart of digital integration, but in District Chaman, they often lack digital skills due to inadequate training opportunities. Existing workshops are irregular, theoretical, and not tailored to classroom realities. Without confidence and competence, teachers avoid using ICT even when facilities are available. The UNESCO ICT Competency Framework for Teachers (ICT-CFT) provides a structured roadmap that can be localized to District Chaman's needs. School-based, hands-on training programs—focused on simple, high-impact practices such as creating multimedia lessons, using projectors, or running

quizzes through mobile phones can improve adoption. Peer-to-peer mentoring and ongoing professional development would provide sustainability.

2.45. Socioeconomic Factors and Affordability

Poverty is also a major hindrance. In District Chaman, numerous families cannot buy computers, smartphones, or regular data packages for the internet. Based on national data, affordability is still the single largest barrier to digital adoption in rural Pakistan. This economic divide results in only a limited number of students having access to digital devices beyond the school. Potential solutions involve subsidized internet packages, device-lending programs, and ICT centre-support from NGOs. Collaboration with telecommunication firms to offer discounted data plans for education can also bridge this affordability gap.

2.46. Community Role and Sustainability

Sustaining digital literacy efforts depends on community engagement. In border towns such as District Chaman, where state resources are scarce, parents, local authorities, and school management committees are responsible for protecting ICT facilities, avoiding misuse, and ensuring inclusivity. Community-based strategies-e.g., ICT committees to manage labs, joint funding of maintenance, and safe internet use awareness sessions-can generate ownership. When digital literacy is understood as a community investment instead of a project from outside the community, it is likely to be sustained.

2.46.1. Policy and Governance Gaps

While Pakistan's National Education Policy and Baluchistan's Education Sector Plans acknowledge the ICT role, implementation in far-flung areas such as District Chaman is thin. Policies tend to target urban areas, with rural schools being under-prioritized. Weak monitoring, inadequate funding, and absence of localized approaches fuel this gap. To address these gaps, there must be policy changes that bring specific resources, better monitoring tools, and incentives to teacher training in underprivileged districts. It is necessary to close the policy-practise gap to align the District Chaman with the national and international digital literacy objectives.

2.46.2. Digital Safety and Citizenship

As more people are getting exposure to technology, the aspect of digital safety has been a point of interest in District Chaman. Teachers and learners are generally unaware of cyberbullying, Internet privacy, fake news and Internet ethics. The issue of harassment and abuse in conservative societies discourages a lot of women and men to go online. Students can be protected, and safer online interaction can be encouraged by incorporating digital citizenship education into school curricula, covering such topics as internet privacy, decent on-line behaviour, and responsible use of social media. Such values can also be facilitated through educating teachers to model safe use of the Internet.

2.47. Benefits and Challenges of Digital Literacy Practices

There are multiple benefits of successful digital literacy practises, including improved student engagement, access to educational resources, and collaboration and creativity (Partnership for 21st Century Skills, 2019). Educators who are skilled in using digital tools can differentiate instructions, support different learning, and equip students with the workforce requirements of the modern economy (OECD, 2019). Nevertheless, there are also some issues, such as the threat of misinformation, cyber-attacks, and technology access imbalance (Livingstone & Helsper, 2007). There are also poor infrastructure, institutional support, and socio-cultural barriers that worsen them in places such as District Chaman (Shah and Khan, 2020). The requirements to get rid of such obstacles are an amalgamation of specific training, policy intervention and public interface making digital literacy achievement effective.

2.48. Creativity

Digital creativity is the process where the teacher is able to design new and interactive digital learning spaces. This implies designing new learning resources, integrating multimedia technologies, and optimising technology according to diverse learning requirements (Redecker, 2017). Digital processes that are creative facilitate active learning, enhance student engagement and facilitate individual learning (Beghetto and Kaufman, 2014). Creative teaching enables teachers to surmount material limitations in case of

secondary schools, like in the case of District Chaman, by developing context-specific digital solutions.

2.49. Critical Thinking

Critical thinking on the Internet implies the assessment of the reliability, credibility, and relevance of the information found online (Facione, 2015). Teachers need these skills to guide students in navigating misinformation and biased digital content. Research highlights that integrating digital tools into lessons can foster analytical reasoning and evidence-based decision-making among both teachers and learners (Ribble, 2015). In under-resourced settings, critical thinking helps educators make informed choices about suitable technologies and pedagogical strategies.

2.50. Practical and Functional Skills

Practical and functional digital skills are the basic competencies required to operate digital devices, use software applications, and troubleshoot common technical problems (Ng, 2012). These skills form the foundation for more advanced digital literacy practices. In secondary education, teachers use these abilities to manage online classrooms, operate interactive boards, and utilize learning management systems (Martin & Grudziecki, 2006). In District Chaman, where technical support is often limited, self-reliance in functional skills is critical for continuous technology use.

2.51. Digital Search Skills

Digital search skills encompass the ability to locate, filter, and retrieve relevant online information efficiently (Eshet-Alkalai, 2004). Teachers must know how to use search engines effectively, apply Boolean operators, and assess search results critically. Studies indicate that proficient search skills enable teachers to enrich lesson content and stay updated with evolving educational trends (Head & Eisenberg, 2010). In rural contexts, strong search skills can help overcome limited access to printed resources by leveraging online repositories and open educational resources.

2.52. Communication and Collaboration

Communication and collaboration within digital literacy include the use of online resources to share information, plan activities, and collaborate towards learning objectives (OECD, 2019). It also encompasses synchronous and asynchronous communication through email, messaging applications, video conferencing, and collaborative websites like Google Workspace. District Chaman teachers can gain from these by participating in peer learning networks, resource sharing, and creating global classroom connections (Voogt et al., 2013). Successful digital collaboration not only enhances professional growth but also demonstrates 21st-century skills for students.



Source: <https://www.blueconnex.com/vital-importance-of-digital-literacy/>

2.53. Key Digital Literacy Skills for Teachers

Essential digital literacy competencies for teachers involve the capacity to incorporate technology into teaching and learning, learn to use new tools, and demonstrate accountable digital behaviour to students (Ng, 2012). These skills include internet navigation, e-content management and learning communities (Redecker, 2017). In the case of high school teachers in District Chaman, the key capacities would ensure effective classroom teaching in digitally enriched learning settings, despite the existence of infrastructural limitations.

2.54. Protecting Personal Data

Digital literacy is about personal data protection. Teachers should be aware of the privacy settings, passwords, encryption applications, and data storage in a secure location (Ribble, 2015). It will assist in preventing identity theft, data breach, and unauthorised access to sensitive data (Livingstone et al., 2017). A sensitivity of data protection even in a relatively rural setting like District Chaman helps in the maintenance of the trust of the parents and students towards digital platforms.

2.55. Navigating Virtual Environments

Virtual navigation refers to online learning platform, virtual classroom, and simulation knowledge (Voogt et al., 2013). These environments are used by teachers to deliver lessons, hold discussions and facilitate collaborative projects without caring about the geographical location. Virtual navigation skill enables educators in underprivileged areas to make the classroom-based learning experience available in other forms (OECD, 2019).

2.56. Managing Online Profiles

Online profile management entails moderating a corporate online presence and maintaining privacy and safety (Greenhow and Robelia, 2009). Teachers need to update professional networking profiles, present educational resources, and contribute positively to online discussion. Proper profile management strengthens credibility, builds professional networks, and provides a model for students on appropriate online involvement (Boyd, 2014).

2.57. Creating Multimodal Documents

Creating multimodal documents involves integrating text, images, audio, and video into cohesive instructional materials (Walsh, 2010). These documents support diverse learning styles and make complex concepts more accessible. For District Chaman's secondary school teachers, multimodal content creation can bridge linguistic and cultural gaps while making lessons more engaging and relevant.

2.57.1. Photo and Video Editing

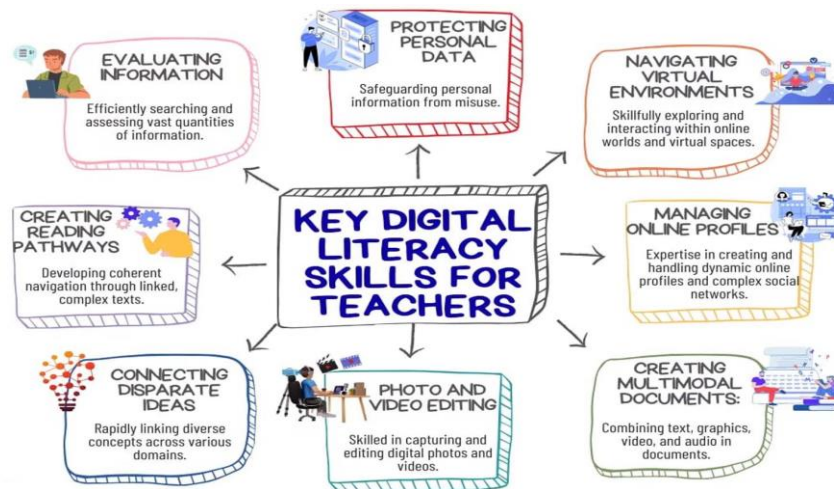
Photo and video editing skills enable teachers to produce customized learning materials, record lessons, and create visual demonstrations (Robin, 2008). Simple editing tools can transform raw media into polished educational resources, enhancing student engagement. In rural contexts, edited media can also be shared offline to overcome internet limitations.

2.57.2. Connecting Disparate Ideas

Connecting disparate ideas is a higher-order digital literacy skill involving synthesizing information from multiple digital sources to create new knowledge (Jenkins et al., 2009). Teachers can link concepts from different subjects, cultural contexts, or online discussions to foster interdisciplinary learning. This approach enhances creativity and critical thinking among students.

2.57.3. Creating Reading Pathways and Evaluating Information

Developing reading pathways entails the selection, sequencing, and annotating of digital texts to navigate students through a complex landscape of information (Coiro & Dobler, 2007). Critical evaluation of information involves the assessment of credibility, accuracy, and relevance. Teachers in District Chaman must make these abilities available to them in order to sift out misinformation and present students with accurate learning resources in a fast-evolving digital world.



Source: <https://www.educatorstechnology.com/2024/01/digital-literacy- skills-for-teachers.html>

2.57.4. Digital Pedagogical Innovations during COVID-19

The COVID-19 pandemic forced secondary school teachers worldwide to rapidly adopt digital teaching methods. In District Chaman Baluchistan, this shift was marked by the use of asynchronous tools, video lectures, and digital assignments to sustain learning amid school closures. Teachers had to quickly learn to manage digital platforms, redesign lesson plans, and engage students remotely despite limited infrastructure. Though such a sudden shift revealed cracks in digital preparedness, it also ignited pedagogical innovation with educators trying new tools and collaborative online learning practices (Hodges et al., 2020).

2.57.5. Teacher Self-Efficacy and Digital Integration

Teachers' self-perceptions in their capability to utilize technology effectively influence the adoption of digital literacy. Highly efficacious individuals are more likely to adopt digital tools and persevere through difficulties and produce improved student learning. Teachers who lack confidence either steer clear of technology or employ it in trivial ways. They only adopt technology when professional development programs improve both skills and confidence, research recommends. Developing teacher self-efficacy has the potential to develop the culture of innovation and ongoing improvement in digital teaching practices (Bandura & Schunk, 2021; Kim & Lee, 2021).

2.57.6. Mobile Learning and Teacher Competence

The emergence of mobile technology has dramatically changed the digital literacy environment for teachers. Mobile learning provides flexibility with the ability to access content any time and any place, a feature particularly vital in isolated or underserved locations such as District Chaman. But educators must acquire competencies not just in operating mobile devices but also in creating interactive, engaging lessons for small screens and changing connectivity conditions. This change needs constant training and facilitation to enable teachers to incorporate mobile learning seamlessly into their instruction and leverage its potential for student engagement and attainment (García-Penalvo et al., 2022; Singh & Thurman, 2022).

2.57.7. Ethics in Digital Literacy

Ethics become more significant as educators incorporate digital tools into the classroom. They must protect students' privacy, store data securely, and teach responsible digital citizenship as key elements of digital literacy. Teachers serve as role models in demonstrating appropriate online behaviour and must be equipped to address cyberbullying, misinformation, and ethical dilemmas related to technology use. Without sufficient ethical training, digital environments can become unsafe or inequitable, negatively impacting students' learning experiences and well-being (Alvarez & Martín, 2023; Chen, 2023).

2.57.8. AI and Advanced Digital Skills

Artificial intelligence (AI) is transforming educational practices by providing adaptive learning platforms, automated assessments, and personalized feedback. For teachers, this technological evolution demands advanced digital literacy skills to understand, evaluate, and effectively incorporate AI tools into their teaching. This includes being able to critically assess AI outputs, customize learning experiences, and ensure technology enhances rather than replaces teacher judgment. Embracing AI requires openness to continuous learning and collaboration with technologists to maximize student learning outcomes (Patel & Zhao, 2025).

2.57.9. Gender Gaps in Digital Access

Gender disparities in access to digital tools and training remain a significant barrier to equitable digital literacy development. In rural and underserved regions such as District Chaman Baluchistan, female teachers face additional cultural, social, and economic obstacles limiting their opportunities to engage with digital technologies. These gaps impede female teachers' professional development and affect digital education inclusiveness. Specialized policies and programs are required to close this gap, facilitating an equitable availability of resources and support to help all teachers, both male and female, achieve digital competences (Khan & Ahmed, 2025).

2.57.10. Post-Pandemic Hybrid Teaching

The post-pandemic school environment more and more is dependent on hybrid systems of online and in-person teaching. Teachers of secondary school need to acquire flexible digital literacy to successfully navigate this multifaceted environment. Hybrid teaching requires the ability to design lessons that transition smoothly between modalities, engage students in both physical and virtual spaces, and use digital tools to foster collaboration and assessment. Continuous professional development and institutional support are essential for teachers to adapt successfully and maintain high-quality instruction (Olsen & Kumar, 2025).

2.57.11. Policy Support for Digital Literacy

Effective policy frameworks play a crucial role in advancing teacher digital literacy. In Pakistan, and particularly in areas like Baluchistan, policies increasingly emphasize sustained professional development, infrastructure investment, and equitable resource distribution. Such policies aim to provide teachers with the training, tools, and technological environment necessary to build and maintain digital literacy skills. Without consistent policy backing, efforts remain fragmented and teachers lack the support needed for meaningful, long-term integration of digital practices (Malik & Farooq, 2025).

2.57.12. Mixed-Methods Perspectives on Digital Literacy Practices

Digital literacy encompasses the abilities to access, evaluate, create, and communicate information using digital technologies, underpinned by critical, technical, and socio-cultural competencies (Ng, 2012). Frameworks in the literature stress that teachers' digital literacy is shaped by contextual factors—such as infrastructure, training, language, and school culture—which can enable or constrain classroom integration (Shah & Khan, 2020; Yousafzai, 2021). In geographically isolated and under-resourced settings like District Chaman, these factors intersect, influencing not only teachers' skill levels but also their pedagogical uptake and confidence.



Methodologically, mixed-methods scholarship shows that combining quantitative trend data with qualitative narratives yields a more valid and nuanced account of digital literacy practices than either strand alone (Creswell & Plano Clark, 2018; Fetters et al., 2013). This lens aligns with the literature's call to capture both measurable competencies and the meanings teachers ascribe to technology use—thereby situating survey-based indicators within lived experiences of access, training, and multilingual classroom realities. This holistic approach underpins the current study's integration of findings and directs the ensuing discussion and recommendations.

2.58. Conclusion

The investigation of secondary school teacher digital literacy practices in District Chaman Baluchistan presents a multifaceted but promising picture. The sudden shift toward digital pedagogy during the COVID-19 pandemic replaced as a driver, unveiling challenges and opportunities alike. Teacher self-efficacy and mobile learning capability present themselves as determining factors of adoption, while ethics and gendered imbalances indicate persistent challenges. In the future, the adoption of AI and migration toward hybrid models of instruction will necessitate educators developing more sophisticated digital competence. Effective and well-targeted policy intervention is essential to alleviate current gaps and ensure meaningful digital literacy progress. Supporting teachers through ongoing training, resources, and ethical advising will be vital to address the changing requirements of 21st-century education in this context.

CHAPTER 3

RESEARCH METHODOLOGY

To have an overall view of the digital literacy practices and the factors affecting them, the study utilizes a mixed-methods approach that integrates both qualitative and quantitative paradigms to investigate the purposes in digital literacy practices among secondary school teachers in District Chaman, Baluchistan. The qualitative aspect applies semi-structured interviews to obtain in-depth information, whereas the quantitative aspect applies surveys to obtain overall data.

3.1. Research Design

The study employs a Mixed-Methods Approach, which integrates both qualitative and quantitative research paradigms to provide a more comprehensive and nuanced understanding of digital literacy practices among secondary school teachers in District Chaman, Baluchistan. By combining these two approaches, the study captures not only the measurable aspects of digital literacy, such as the frequency and types of digital tools used (quantitative), but also the subjective experiences, perceptions, and attitudes of teachers toward digital integration in their classrooms (qualitative). This dual approach allows for a convergent parallel design, where both forms of data are collected simultaneously, analysed separately, and then synthesized to offer a holistic picture of how teachers engage with and implement digital literacy practices in a context characterized by unique socioeconomic and infrastructural factors (Creswell & Plano Clark, 2018).

3.2. Population and Sample

Although the study refers to Quetta Division as the broader geographical context, District Chaman was selected as the specific study site due to practical and contextual considerations. These included ease of administrative access and permissions, availability of secondary school teachers, feasibility and security of conducting the research, and the researcher's familiarity with the area. Focusing on Chaman allowed for a manageable and concentrated investigation while ensuring that the findings remain relevant and transferable to the wider educational context of Quetta Division.

Population

The population for this study included secondary school teachers in District Chaman, Baluchistan, including those serving in both public and private institutions. This broad inclusion ensured a diverse representation of teaching environments, professional backgrounds, and levels of access to digital resources.

Sample

The sample size (n) was determined using Krejcie and Morgan's (1970) sample size determination table, based on the known population (N) of secondary school teachers and schools in District Chaman. The selected sample reflects a balanced distribution of teachers across various school types and administrative structures.

Exposure to teacher training programs-such as ICT trainings, CPD initiatives, Digital Skills for Teachers, and online trainings conducted during and after COVID-19-also influenced the digital literacy levels observed within the sampled group. Teachers who participated in these programs demonstrated higher proficiency in lesson planning, digital communication, and effective use of instructional technologies. Such training not only enhanced their confidence in using digital tools but also encouraged more frequent and focussed integration of technology in the classroom. As a result, training exposure emerged as a significant factor contributing to variations in teachers' digital competence within the study sample.

3.1.1 Population and Sample Tables

The following table presents the targeted population selected for this study.

Table 3.1: Targeted population

| S. No | Population | Numbers |
|-------|--|---------|
| 01 | Number of High Schools (Public VS Private) | 30 |
| 02 | Number of male SSTs | 80 |
| 03 | Number of female SSTs | 30 |
| 04 | Number of total SSTs | 110 |

Table 3.1 highlights the diversity of teachers in subject expertise, experience, and school sector, ensuring varied perspectives on digital literacy practices. This diversity enables comparisons between experienced and early-career teachers and reveals how institutional resources and priorities influence digital learning environments.

Table 3.2: Sample

| S. No | Population (N) | Sample (n) |
|-------|---|------------|
| 01 | Number of High Schools (Public VS Private) = 30 | 28 |
| 02 | Number of male SSTs= 80 | 66 |
| 03 | Number of female SSTs= 30 | 28 |
| 04 | Number of total SSTs= 110 | 86 |

Table 3.2, the study employed semi-structured interviews, document analysis, and classroom observations. Using multiple sources enabled triangulation, enhancing the depth and validity of findings. Documents provided institutional context, observations offered first-hand insights into classroom practices, and interviews captured teachers' perspectives and challenges. The data collection schedule was carefully structured to ensure sufficient participation with minimal disruption.

3.3. Instruments

The study employed the following research instrument to collect relevant data.

Questionnaire

The digital literacy practices of secondary school teachers were evaluated through the development of a self-developed questionnaire at 5-point Likert's scale.

It was possible to investigate the contextual elements impacting digital literacy practices by making a semi-structured interview guide. For teachers to express their experiences, difficulties, and viewpoints in their own words, the handbook had open-ended questions.

3.4. Procedure (Validity, Pilot testing & Reliability)

Validity

Subject matter specialists examined the questionnaire and interview guide to guarantee content accuracy and academic rigor. Regarding clarity, relevance, and compatibility with the study's objectives, these specialists-university faculty and seasoned teacher educators in curriculum studies, educational technology, and professional development offered input (see Table). Their suggestions improved contextual fit by increasing probing cues, eliminating repetitions, and rewording unclear material. The general reliability and content validity of the instruments were reinforced by this evaluation procedure.

Table 3.3: Details of Validity Experts and Summary of Feedback

| Expert Name | Academic Qualification | Area of Specialization | Institution / Organization | Feedback Provided |
|---------------------------|------------------------|------------------------|--|--|
| Dr. Muhammad Munir Kayani | PhD | Science Education | Associate Professor/ Chairperson Department of TE, FoE IIU, Islamabad. | Suggested refining questionnaire statements for clarity and alignment with research objectives |

| Expert Name | Academic Qualification | Area of Specialization | Institution / Organization | Feedback Provided |
|-------------------------|-------------------------------|-------------------------------|--|--|
| Dr. Muhammad Nasir Khan | Post Doctorate | Peace Education | Associate Professor Department of TE, FoE IIU, Islamabad. | Recommended improving the structure and sequencing of interview questions. |

Pilot Testing

To evaluate the efficacy, relevance, and clarity of the survey and interview questions, pilot research involving a small subset of teachers (about 20) was carried out. Researcher used the pilot study's feedback to improve the instruments.

Reliability

Cronbach's alpha was used to determine internal consistency and assess the survey instrument's reliability. Acceptable dependability values were those with a coefficient of 0.75 or above.

3.5 Data Collection

Practicalities

There were two stages to the data gathering process: surveys and interviews. Both online and in-person surveys were given out to ensure general participation. In-person or video conference interviews were done based on the preferences and availability of the participants.

3.6 Data Analysis

This section presents the methods applied to interpret the data.

Quantitative Data

Inferential and descriptive statistics was used to examine the survey data. The practices of digital literacy were outlined using descriptive statistics (mean, standard deviation, frequency). We explored group differences (public vs. private school teachers, for example) using inferential statistics (t-tests, ANOVA).

Qualitative Data

The information from the interviews were copied and subjected to thematic analysis. To code the data and find recurring patterns, NVivo software was used. Understanding the complex elements impacting digital literacy practices was made easier with the use of thematic analysis.

3.7 Ethical Considerations

The suitable institutional review board provided ethical approval. The goal, methods, and right to discontinue participation at any moment was explained to research participants. Every participant's informed permission was required. During the study process, data has been securely kept, and secrecy and privacy has been preserved.

3.8 Work Plan

Table 3.4: Work plan table and timeline summary

| Stage | Description | Deadline |
|-------|--|----------|
| 01 | Developing and approval of Research Proposal | 15-09-24 |
| 02 | Review literature | 15-12-24 |
| 03 | Development of instruments | 10-02-25 |
| 04 | Review of an improvement area | 10-03-25 |
| 05 | Data collection | 01-05-25 |
| 06 | Data analysis and interpretation | 15-06-25 |
| 07 | Writing and submitting the first draft of the thesis | 20-09-25 |
| 08 | Editing and submitting the final draft of the thesis | 30-10-25 |

3.9 Summary

This study used a mixed-methods methodology to explore how secondary school teachers in District Chaman, Baluchistan, use digital literacy. Teachers' self-reported digital abilities, tool usage frequency, infrastructure accessibility, and satisfaction with professional development were all quantitatively assessed using a structured survey. Semi-structured interviews (and, when possible, quick classroom observations) were used to collect qualitative data on teachers' perspectives, practical approaches to incorporating digital technologies, and contextual limitations. To assure representation across school types, genders, and subject areas, a stratified sampling strategy was used to select teachers from District Chaman's public and private secondary schools.

After being adapted from well-known digital literacy measures and examined by subject-matter specialists, the instruments' construct validity and reliability were examined using factor checks and pilot testing (Cronbach's α). Formal approvals, informed consent, confidentiality protections, and voluntary participation were all followed during the data collecting process. While qualitative data underwent theme analysis with iterative coding and member verification to increase trustworthiness, quantitative data were analysed using descriptive statistics and inferential tests that were in line with the study objectives. Cross-methods triangulation enhanced the credibility of the findings. Delimitations (with a focus on District Chaman's secondary level) and limitations (e.g., self-report bias, access restrictions) were also explained in the chapter. The overall aim of the methodology was to generate rich, contextually sensitive data regarding teachers' views, the effectiveness of training, and levels of digital literacy so that they can inform practice and policy.

CHAPTER 4

DATA ANALYSIS AND INTERPRETATION

The examination and explanation of data gathered through a mixed methods approach to investigate the digital literacy habits of secondary school teachers of District Chaman, Baluchistan, are brought out in this chapter. Detailed information about teachers' digital competence, disposition, and instructional practices is provided by the chapter's intersection of quantitative and qualitative data. Whereas open-ended responses and semi-structured interviews produced qualitative observations that provided patterns depth, context, and meaning, quantitative information from standardized questionnaires provide quantifiable patterns and trends.

A more nuanced and richer interpretation is enabled by the integration of these two strands of data, ensuring those teachers' individual narratives and histories inform and reinforce quantitative findings. This double vision helps to pick up the nuances of digital literacy in a geographically remote, under-resourced setting such as District Chaman, where infrastructure, training facilities, and cultural assumptions all work together to influence the application of technology in the classroom.

The quantitative findings that correspond with each study goal are presented first in this chapter, which is then followed by theme interpretations of the qualitative data. The foundation for the discussion and suggestions in the next chapter is laid by these findings, which collectively answer the main study subjects.

4.1. Demographic Variables

Demographic variables pertaining to respondents of the study are presented in this section.

Table 4.1: Gender related Characteristics of the Respondents

| Gender | Frequency | Percentage |
|------------------------------------|-------------|------------|
| Male | 53 | 84.1 |
| Female | 10 | 15.9 |
| Mean (Proportion of Males) | 0.84 | |
| Standard Deviation (Binary) | 0.37 | |

Table 4.1 The majority of respondents were male (84.1%), while female respondents constituted only 15.9% of the sample. The mean proportion of 0.84 indicates a strong male dominance in the teaching workforce represented in this study. The standard deviation (SD = 0.37) reflects the uneven distribution between the two gender groups. This gender imbalance may have implications for understanding differences in access to digital training, professional development opportunities, and technology-use patterns among teachers.

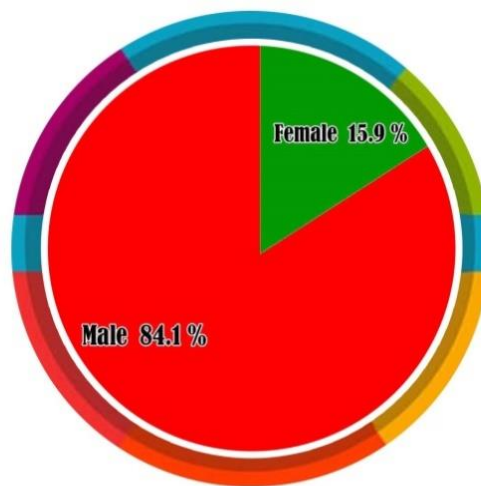


Figure 4.1: Gender Distribution of Participants

Table 4.2: Age Distribution

| Age Range | Frequency | Percentage |
|--------------------------------|--------------------|------------|
| 20-25 | 10 | 15.9 |
| 26-30 | 10 | 15.9 |
| 31-35 | 15 | 23.8 |
| 36-40 | 15 | 23.8 |
| 41-45 | 5 | 7.9 |
| 46-50 | 5 | 7.9 |
| 51-55 | 0 | 0.0 |
| 56-60 | 2 | 3.2 |
| Mean Age (M) | 34.53 years | |
| Standard Deviation (SD) | 8.48 | |

Table: 4.2 The mean age of respondents was 34.53 years (SD = 8.48), indicating that the sample was largely composed of mid-career teachers. The 31–35 and 36–40 age groups were the most represented (each 23.8%), suggesting that most participants were in the early to middle stages of their professional careers. Only a small proportion were above 45 years, and very few were nearing retirement age (56–60). Overall, the sample reflects a predominantly young to middle-aged teaching workforce, which may shape their engagement with and exposure to digital technologies.

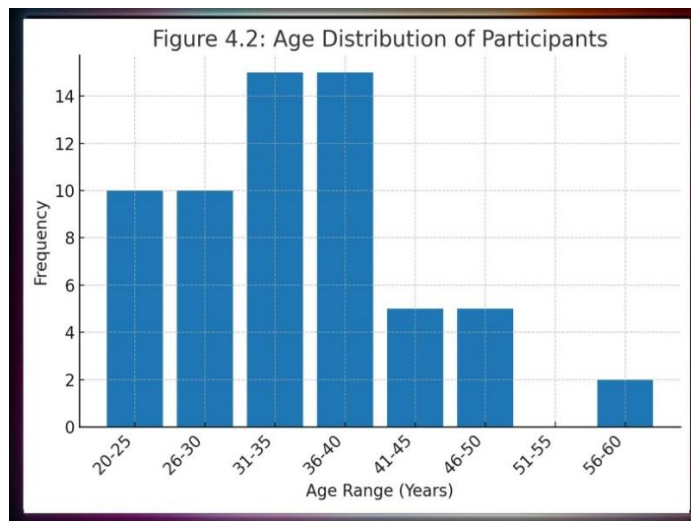


Figure 4.2: Age Distribution of Participants

Table 4.3: Years of Teaching Experience

| Years of Experience | Frequency | Percentage |
|------------------------------------|-------------------|------------|
| 5-10 | 26 | 41.3 |
| 11-15 | 28 | 44.4 |
| 16-20 | 2 | 3.2 |
| 21-25 | 1 | 1.6 |
| 26-30 | 1 | 1.6 |
| 31-35 | 3 | 4.8 |
| Mean | 12.2 years | |
| Standard Deviation (SD) | 6.17 years | |

Table: 4.4 The majority of teachers (85.7%) have 5–15 years of experience, indicating most are mid-career. Only a small proportion (11.2%) have more than 20 years of experience. The mean experience is 12.2 years, with moderate variability (SD = 6.17), suggesting a moderately diverse range of teaching experience.



Figure 4.3: Teaching Experience of Participants

4.2. Digital Literacy

Table 4.4: Confidence in Using Digital Tools

| Response | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 9 | 14.3% |
| Disagree (D) | 2 | 3.2% |
| Neutral (N) | 5 | 7.9% |
| Agree (A) | 22 | 34.9% |
| Strongly Agree (SA) | 25 | 39.7% |
| Total | 63 | 100% |
| Mean | 3.83 | |

Table 4.4 Confidence in Using Digital Tools. The results show that 74.6% of teachers agreed or strongly agreed that they feel confident in using digital tools such as computers, tablets, and smartphones for teaching. The mean score of **3.83** reflects a generally high confidence level, though about 18% of respondents reported low confidence, indicating the need for further support and training.

Table 4.5: Ability to Find and Use Online Educational Resources

| Response | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 3 | 4.8% |
| Disagree (D) | 1 | 1.6% |
| Neutral (N) | 4 | 6.3% |
| Agree (A) | 27 | 42.9% |
| Strongly Agree (SA) | 28 | 44.4% |
| Total | 63 | 100% |
| Mean | 4.21 | |

Table 4.5: Ability to Find and Use Online Educational Resources. A strong majority of 87.3% reported that they can easily find and use educational resources from the internet. With a mean score of 4.21, this item reflects the highest competency among all five statements, showing teachers' strong reliance on online resources for teaching and learning.

Table 4.6: Understanding of Basic Digital Concepts

| Response | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 1 | 1.6% |
| Disagree (D) | 6 | 9.5% |
| Neutral (N) | 7 | 11.1% |
| Agree (A) | 26 | 41.3% |
| Strongly Agree (SA) | 23 | 36.5% |
| Total | 63 | 100% |
| Mean | 4.02 | |

Table 4.6 Understanding of Basic Digital Concepts. Nearly 77.8% of respondents agreed or strongly agreed that they understand basic digital concepts such as file management, data storage, and internet safety. The mean score of **4.02** suggests solid awareness of fundamental digital skills, although around 11% expressed disagreement, indicating gaps in technical understanding.

Table 4.7: Regular Use of Digital Tools in Daily Life

| Response | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 1 | 1.6% |
| Disagree (D) | 6 | 9.5% |
| Neutral (N) | 11 | 17.5% |
| Agree (A) | 29 | 46.0% |
| Strongly Agree (SA) | 15 | 23.8% |
| Total | 63 | 100% |
| Mean | 3.76 | |

Table 4.7: Regular Use of Digital Tools in Daily Life. Around 69.8% of respondents agreed or strongly agreed that they use digital tools regularly in personal or professional life. The mean score of **3.76** indicates a moderate-to-high integration of digital technology, though the 17.5% neutral responses suggest that not all teachers are consistently engaged with digital tools.

Table 4.8: Digital Literacy as an Essential Skill for Teachers

| Response | Frequency | Percentage |
|------------------------|-------------|-------------|
| Strongly Disagree (SD) | 1 | 1.6% |
| Disagree (D) | 2 | 3.2% |
| Neutral (N) | 2 | 3.2% |
| Agree (A) | 9 | 14.3% |
| Strongly Agree (SA) | 43 | 68.3% |
| Total | 63 | 100% |
| Mean | 4.16 | |

Table 4.8: Digital Literacy as an Essential Skill for Teachers. The overwhelming majority (82.6%) of respondents agreed or strongly agreed that digital literacy is an essential skill for teachers in the 21st century. The mean score of **4.16** highlights strong consensus on the importance of digital literacy, confirming its role as a fundamental competency in modern education.

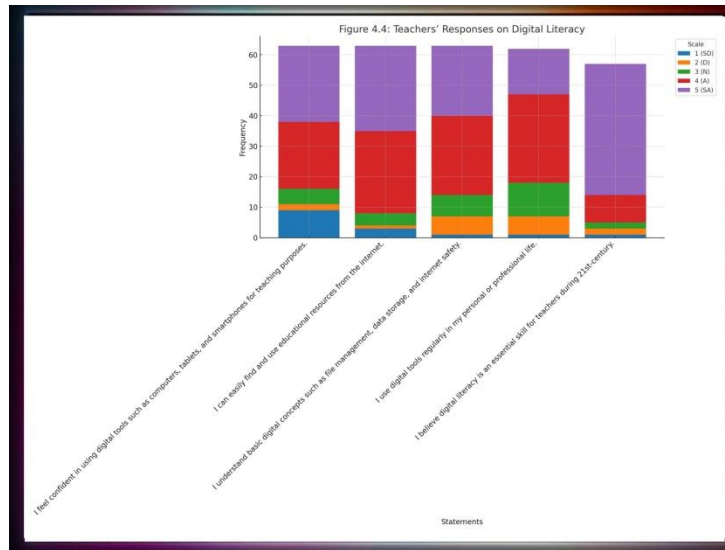


Figure 4.4: Teachers' Responses on Digital Literacy

4.3. Current Teacher Training Programs

Table 4.9: Practical Use of Digital Tools in Training

| Response | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 5 | 7.9% |
| Disagree (D) | 10 | 15.9% |
| Neutral (N) | 14 | 22.2% |
| Agree (A) | 23 | 36.5% |
| Strongly Agree (SA) | 10 | 15.9% |
| Total | 63 | 100% |
| Mean | 3.32 | |

Table 4.9: Practical Use of Digital Tools in Training. A total of 52.4% of respondents agreed or strongly agreed that training programs included practical use of digital tools, while 23.8% disagreed. The mean score of **3.32** suggests a moderate level of satisfaction, showing that although some hands-on practice was provided, it was not sufficient for all participants.

Table 4.10: Preparation for Technology Integration

| Response | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 5 | 7.9% |
| Disagree (D) | 14 | 22.2% |
| Neutral (N) | 11 | 17.5% |
| Agree (A) | 28 | 44.4% |
| Strongly Agree (SA) | 6 | 9.5% |
| Total | 63 | 100% |
| Mean | 3.30 | |

Table 4.10 Preparation for Technology Integration. Although 53.9% of teachers felt training sessions prepared them to integrate digital technology into classrooms, about 30.1% disagreed. The mean score of **3.30** reflects only a moderate effectiveness of training in equipping teachers for classroom technology use.

Table 4.11: Support and Mentorship during Training

| Response | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 5 | 7.9% |
| Disagree (D) | 14 | 22.2% |
| Neutral (N) | 15 | 23.8% |
| Agree (A) | 14 | 22.2% |
| Strongly Agree (SA) | 14 | 22.2% |
| Total | 63 | 100% |
| Mean | 3.24 | |

Table 4.11: Support and Mentorship during Training. The responses were mixed, with 44.4% agreeing or strongly agreeing that they received adequate support or mentorship, while 30.1% disagreed and 23.8% remained neutral. The mean score of **3.24** indicates limited and inconsistent support during digital training sessions.

Table 4.12: Addressing Rural School Challenges

| Response | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 1 | 1.6% |
| Disagree (D) | 12 | 19.0% |
| Neutral (N) | 11 | 17.5% |
| Agree (A) | 27 | 42.9% |
| Strongly Agree (SA) | 11 | 17.5% |
| Total | 63 | 100% |
| Mean | 3.51 | |

Table 4.12 Addressing Rural School Challenges. A majority of respondents (60.4%) agreed or strongly agreed that training programs addressed the challenges of using technology in rural schools, while 20.6% disagreed. The mean score of **3.51** reflects relatively positive perceptions, though not all training sessions effectively considered rural-specific issues.

Table 4.13: Alignment of Training with Modern Digital Teaching Needs

| Response | Frequency | Percentage |
|------------------------|-------------|-------------|
| Strongly Disagree (SD) | 5 | 7.9% |
| Disagree (D) | 8 | 12.7% |
| Neutral (N) | 13 | 20.6% |
| Agree (A) | 22 | 34.9% |
| Strongly Agree (SA) | 14 | 22.2% |
| Total | 63 | 100% |
| Mean | 3.46 | |

Table 4.13 Alignment of Training with Modern Digital Teaching Needs. About 57.1% of teachers agreed or strongly agreed that training programs are aligned with modern digital teaching needs, while 20.6% were neutral and another 20.6% disagreed. The mean score of 3.46 suggests partial alignment, with room for significant improvement to meet evolving 21st-century teaching demands.

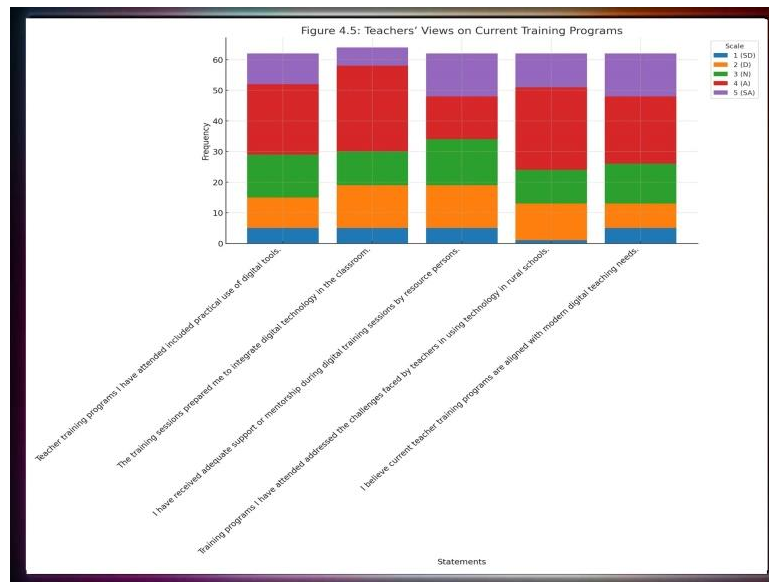


Figure 4.5: Teachers' Views on Current Training Programs

4.4. Promoting Digital Literacy

Table 4.14: School Encouragement for Using Digital Tools

| Response | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 5 | 7.9% |
| Disagree (D) | 5 | 7.9% |
| Neutral (N) | 9 | 14.3% |
| Agree (A) | 25 | 39.7% |
| Strongly Agree (SA) | 18 | 28.6% |
| Total | 63 | 100% |
| Mean | 3.68 | |

Table 4.14: School Encouragement for Using Digital Tools. A total of 68.3% of respondents agreed or strongly agreed that their school encourages the use of digital tools. The mean score of **3.68** shows a generally positive environment for promoting digital literacy, though a small portion (15.8%) expressed disagreement.

Table 4.15: Availability of Digital Resources

| Response | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 11 | 17.5% |
| Disagree (D) | 21 | 33.3% |
| Neutral (N) | 14 | 22.2% |
| Agree (A) | 9 | 14.3% |
| Strongly Agree (SA) | 7 | 11.1% |
| Total | 63 | 100% |
| Mean | 2.63 | |

Table 4.15 Availability of Digital Resources. More than half (50.8%) disagreed that there are enough resources in their schools to promote digital literacy, while only 25.4% agreed or strongly agreed. The mean score of **2.63** is the lowest in this section, highlighting a major challenge regarding infrastructure and resource availability.

Table 4.16: Self-Learning and Training Efforts

| Response | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 3 | 4.8% |
| Disagree (D) | 1 | 1.6% |
| Neutral (N) | 6 | 9.5% |
| Agree (A) | 31 | 49.2% |
| Strongly Agree (SA) | 21 | 33.3% |
| Total | 63 | 100% |
| Mean | 4.00 | |

Table 4.16 Self-Learning and Training Efforts. A strong majority (82.5%) agreed or strongly agreed that they actively improve their digital literacy through self-learning or training. The mean score of **4.00** reflects a proactive attitude among teachers towards enhancing their digital skills independently.

Table 4.17: Guiding Students in Responsible Use of Digital Tools

| Response | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 7 | 11.1% |
| Disagree (D) | 0 | 0.0% |
| Neutral (N) | 4 | 6.3% |
| Agree (A) | 27 | 42.9% |
| Strongly Agree (SA) | 23 | 36.5% |
| Total | 63 | 100% |
| Mean | 3.84 | |

Table 4.17 Guiding Students in Responsible Use of Digital Tools. Nearly 79.4% of teachers agreed or strongly agreed that they guide their students to use digital tools responsibly and effectively. The mean score of **3.84** suggests strong teacher commitment to promoting responsible digital behaviour, though 11.1% expressed disagreement.

Table 4.18: Government Focus on Promoting Digital Literacy

| Response | Frequency | Percentage |
|------------------------|-------------|-------------|
| Strongly Disagree (SD) | 10 | 15.9% |
| Disagree (D) | 11 | 17.5% |
| Neutral (N) | 12 | 19.0% |
| Agree (A) | 19 | 30.2% |
| Strongly Agree (SA) | 10 | 15.9% |
| Total | 63 | 100% |
| Mean | 3.08 | |

Table 4.18 Government Focus on Promoting Digital Literacy. Responses were divided, with 46.1% agreeing or strongly agreeing that the government focuses on digital literacy in schools, while 33.4% disagreed and 19% were neutral. The mean score of **3.08** indicates only a moderate perception of government commitment in this area.

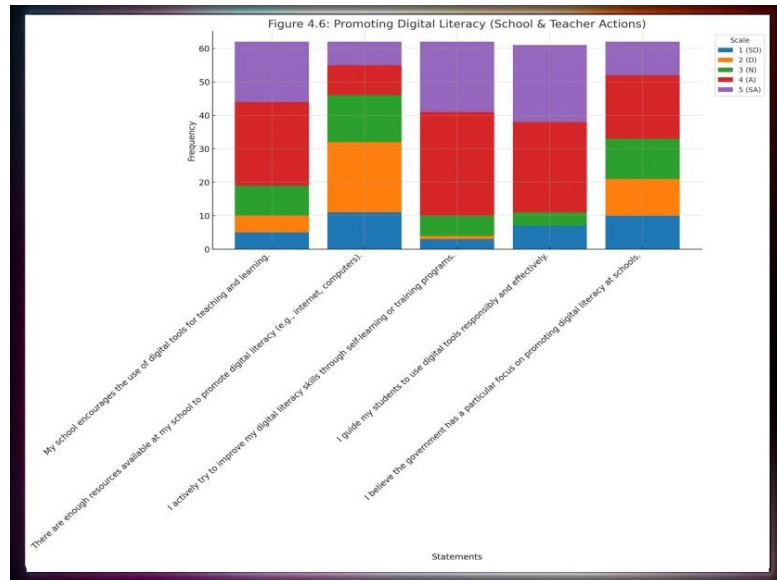


Figure 4.6: Promoting Digital Literacy (School & Teacher Actions)

4.5. Significance for Teaching

Table 4.19: Effective Teaching through Digital Tools

| Response | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 1 | 1.6% |
| Disagree (D) | 4 | 6.3% |
| Neutral (N) | 3 | 4.8% |
| Agree (A) | 25 | 39.7% |
| Strongly Agree (SA) | 29 | 46.0% |
| Total | 63 | 100% |
| Mean | 4.17 | |

Table 4.19 Effective Teaching through Digital Tools. A large majority (85.7%) agreed or strongly agreed that digital tools help them teach more effectively. The mean score of 4.17 reflects strong confidence in the instructional benefits of digital tools.

Table 4.20: Engagement and Interactivity of Lessons

| Response | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 3 | 4.8% |
| Disagree (D) | 4 | 6.3% |
| Neutral (N) | 3 | 4.8% |
| Agree (A) | 17 | 27.0% |
| Strongly Agree (SA) | 35 | 55.6% |
| Total | 63 | 100% |
| Mean | 4.17 | |

Table 4.20: Engagement and Interactivity of Lessons. A significant 82.6% of teachers agreed or strongly agreed that digital technology makes lessons more engaging and interactive for students. The mean score of 4.17 confirms a highly positive perception of technology's role in creating engaging learning environments.

Table 4.21: Efficiency in Managing Classroom Tasks

| Response | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 5 | 7.9% |
| Disagree (D) | 1 | 1.6% |
| Neutral (N) | 9 | 14.3% |
| Agree (A) | 20 | 31.7% |
| Strongly Agree (SA) | 27 | 42.9% |
| Total | 63 | 100% |
| Mean | 3.95 | |

Table 4.21: Efficiency in Managing Classroom Tasks. A total of 74.6% agreed or strongly agreed that digital literacy helps them manage classroom tasks more efficiently. The mean score of 3.95 suggests good acceptance, though nearly 15.9% remained neutral and 9.5% disagreed, showing that not all teachers find classroom management fully supported by digital tools.

Table 4.22: Enhancing Student Learning Outcomes

| Response | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 2 | 3.2% |
| Disagree (D) | 1 | 1.6% |
| Neutral (N) | 6 | 9.5% |
| Agree (A) | 38 | 60.3% |
| Strongly Agree (SA) | 24 | 25.4% |
| Total | 63 | 100% |
| Mean | 4.67 | |

Table 4.22 Enhancing Student Learning Outcomes. An overwhelming 85.7% of teachers agreed or strongly agreed that teaching with digital tools enhances student learning outcomes. The high mean score of 4.67 (the highest in this section) underscores strong recognition of the positive impact of digital tools on student achievement.

Table 4.23: Supporting Inclusive Education

| Response | Frequency | Percentage |
|------------------------|-------------|-------------|
| Strongly Disagree (SD) | 1 | 1.6% |
| Disagree (D) | 3 | 4.8% |
| Neutral (N) | 14 | 22.2% |
| Agree (A) | 30 | 47.6% |
| Strongly Agree (SA) | 14 | 22.2% |
| Total | 63 | 100% |
| Mean | 3.79 | |

Table 4.23 Supporting Inclusive Education. About 69.8% of teachers agreed or strongly agreed that integrating digital tools supports inclusive education for diverse learners. The mean score of 3.79 reflects a generally positive view, though the relatively high neutral responses (22.2%) suggest that some teachers are uncertain about the inclusivity potential of digital tools.

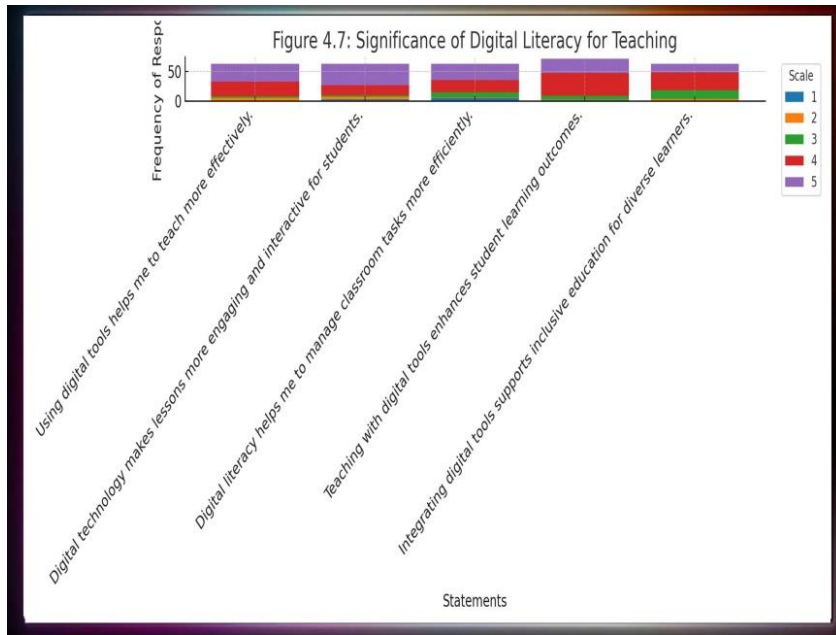


Figure 4.7: Significance of Digital Literacy for Teaching

4.6. Teachers' Perceptions toward Digital Literacy

Table 4.24: Positive Attitude toward Learning and Using Digital Tools

| Response | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 1 | 1.6% |
| Disagree (D) | 3 | 4.8% |
| Neutral (N) | 3 | 4.8% |
| Agree (A) | 24 | 38.1% |
| Strongly Agree (SA) | 32 | 50.8% |
| Total | 63 | 100% |
| Mean | 4.32 | |

Table 4.24 Positive Attitude toward Learning and Using Digital Tools. A large majority (88.9%) agreed or strongly agreed that they have a positive attitude toward learning and using new digital tools in classrooms. The mean score of **4.32** highlights strong enthusiasm and openness among teachers toward adopting new digital practices.

Table 4.25: Belief in Digital Literacy for Professional Skills

| Response | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 3 | 4.8% |
| Disagree (D) | 1 | 1.6% |
| Neutral (N) | 0 | 0.0% |
| Agree (A) | 23 | 36.5% |
| Strongly Agree (SA) | 36 | 57.1% |
| Total | 63 | 100% |
| Mean | 4.40 | |

Table 4.25 Belief in Digital Literacy for Professional Skills. An overwhelming 93.6% of teachers agreed or strongly agreed that digital literacy improves their professional skills. With a high mean of 4.40, this item indicates strong recognition of digital literacy's role in teacher professional development.

Table 4.26: Motivation to Explore New Technologies

| Response | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 2 | 3.2% |
| Disagree (D) | 1 | 1.6% |
| Neutral (N) | 5 | 7.9% |
| Agree (A) | 30 | 47.6% |
| Strongly Agree (SA) | 26 | 41.3% |
| Total | 63 | 100% |
| Mean | 4.27 | |

Table 4.26 Motivation to Explore New Technologies. A strong majority (88.9%) reported being motivated to explore new technologies for effective teaching. The mean score of **4.27** confirms high levels of motivation, showing teachers' willingness to adopt innovations in their instructional practices.

Table 4.27: Belief that Digitally Literate Teachers Teach Effectively

| Response | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 5 | 7.9% |
| Disagree (D) | 1 | 1.6% |
| Neutral (N) | 3 | 4.8% |
| Agree (A) | 23 | 36.5% |
| Strongly Agree (SA) | 31 | 49.2% |
| Total | 63 | 100% |
| Mean | 4.17 | |

Table 4.27 Belief that Digitally Literate Teachers Teach Effectively. Most teachers (85.7%) agreed or strongly agreed that digitally literate teachers can teach more effectively in classrooms. The mean score of **4.17** reflects a strong belief in the direct link between digital literacy and teaching effectiveness, despite 9.5% showing disagreement or uncertainty.

Table 4.28: Motivation from School Administration

| Response | Frequency | Percentage |
|------------------------|-------------|-------------|
| Strongly Disagree (SD) | 8 | 12.7% |
| Disagree (D) | 11 | 17.5% |
| Neutral (N) | 18 | 28.6% |
| Agree (A) | 13 | 20.6% |
| Strongly Agree (SA) | 13 | 20.6% |
| Total | 63 | 100% |
| Mean | 3.19 | |

Table 4.28 Motivation from School Administration. Perceptions were divided, with 41.2% agreeing or strongly agreeing that school administrations motivate teachers to use digital tools, while 30.2% disagreed and 28.6% remained neutral. The mean score of **3.19** shows only moderate encouragement from administrations, suggesting institutional support is not consistent across schools.

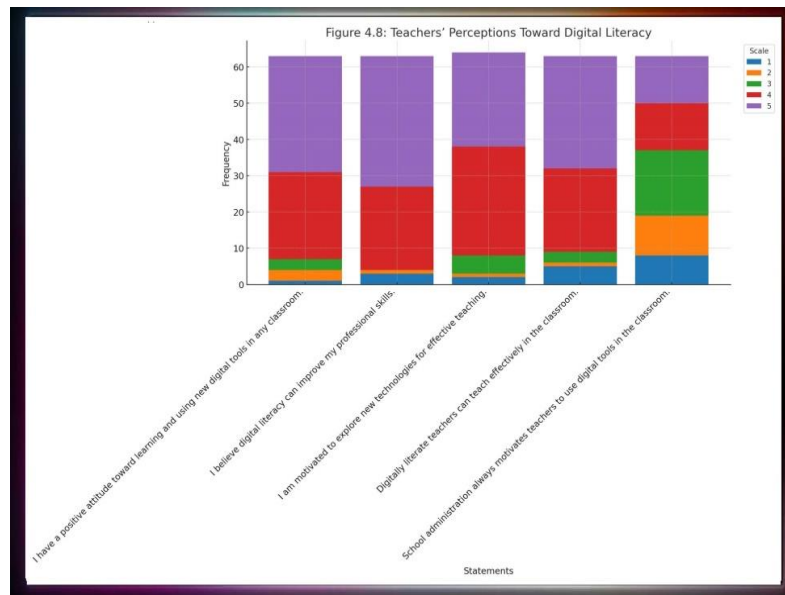


Figure 4.8: Teachers' Perceptions toward Digital Literacy

4.7. Interview Findings (Qualitative Themes)

Table 4.29: Themes from Interviews

| Theme | Condensed Evidence from Data | Illustrative Teacher Quotes | Coding Path (How Theme Emerged) |
|---|---|---|--|
| Teacher Motivation for Digital Tools | Teachers reported increased student engagement, improved conceptual explanation, time efficiency, and broader access to teaching resources. | “When I use videos or animations, students understand faster and stay attentive.” (T3) “Digital tools help me save time while preparing lessons.” (T7) | Initial codes: student interest, better explanation, time-saving → Sub-code: perceived usefulness → Theme: Motivation for Digital Tools |
| Barriers to Digital Integration | Persistent electricity outages, weak internet, shortage of devices, limited advanced training, and English language barriers. | “Sometimes electricity goes off right in the middle of class; then everything stops.” (T12) “Software instructions are in English, which is difficult for many teachers.” (T9) | Initial codes: electricity issues, internet problems, training gap → Sub-code: structural constraints → Theme: Barriers to Digital Integration |
| Impact of Digital Literacy on Teaching | Improved differentiated instruction, increased student response, efficient feedback, and updated content. | “Students respond more when I use digital content than when I use only the board.” (T6) | Initial codes: better interaction, quick feedback → Sub-code: teaching enhancement → Theme: Impact on Teaching Practices |
| Limited/Short Training Opportunities | Teachers mostly attended brief workshops, | “We only get short workshops, maybe once or twice a year, and | Initial codes: short trainings, self-learning → Sub-code: insufficient |

| Theme | Condensed Evidence from Data | Illustrative Teacher Quotes | Coding Path (How Theme Emerged) |
|---|---|---|---|
| Future Vision for Digital Literacy | <p>webinars, or NGO sessions; relied heavily on self-learning and peer support.</p> <p>Teachers envisioned stable internet, purpose-built digital classrooms, structured CPD, and home access for students.</p> | <p>then we manage the rest ourselves.” (T15)</p> <p>“If the school had strong internet and digital classrooms, we could teach much better.” (T11)</p> | <p>capacity-building → Theme: Limited Training Opportunities</p> <p>Initial codes: need better connectivity, need structured CPD → Sub-code: aspirational change → Theme: Future Vision for Improvement</p> |
| Administrative Support and Limitations | <p>Administrators provided moral support and basic resources, but faced budget and infrastructure constraints.</p> | <p>“The head encourages us, but we don’t have enough devices or funds.” (T8)</p> | <p>Initial codes: moral support, limited budget → Sub-code: institutional capacity limits → Theme: Administrative Support & Constraints</p> |
| Student Response to Digital Tools | <p>Students showed higher engagement, collaboration, and independent inquiry, though distraction risks remained.</p> | <p>“Students become more active, but sometimes they get distracted by games.” (T5)</p> | <p>Initial codes: engagement, distraction → Sub-code: student digital behaviour → Theme: Student Digital Engagement</p> |
| Informal Assessment of Digital Skills | <p>Teachers evaluated digital skills through project tasks, observation, and practical demonstrations.</p> | <p>“I check how students search information and use tools, rather than just asking questions.” (T4)</p> | <p>Initial codes: practical assessment, observation → Sub-code: performance-based evaluation → Theme: Informal Digital Skill Assessment</p> |

| Theme | Condensed Evidence from Data | Illustrative Teacher Quotes | Coding Path (How Theme Emerged) |
|--|---|---|--|
| Hybrid Teaching Approaches | Teachers blended traditional teaching with digital tools where feasible and contextually relevant. | “I combine board writing with videos. It depends on the topic and resources available.” (T10) | Initial codes: mix of methods → Sub-code: contextual adaptation → Theme: Hybrid Instructional Approaches |
| Weak Policy Implementation in Rural Areas | Policies exist, but implementation and follow-up in rural settings are inconsistent and unsustainable post-COVID. | “Policies are there, but in rural schools we don’t see real implementation.” (T2) | Initial codes: policy exists but not practiced → Sub-code: implementation gap → Theme: Weak Policy Execution |

Table 4.29 The analysis employed thematic coding across interview transcripts. Initial open codes were grouped into sub-categories and further refined into overarching themes. Teacher quotations were used to ensure that the interpretation authentically reflected participants’ voices.

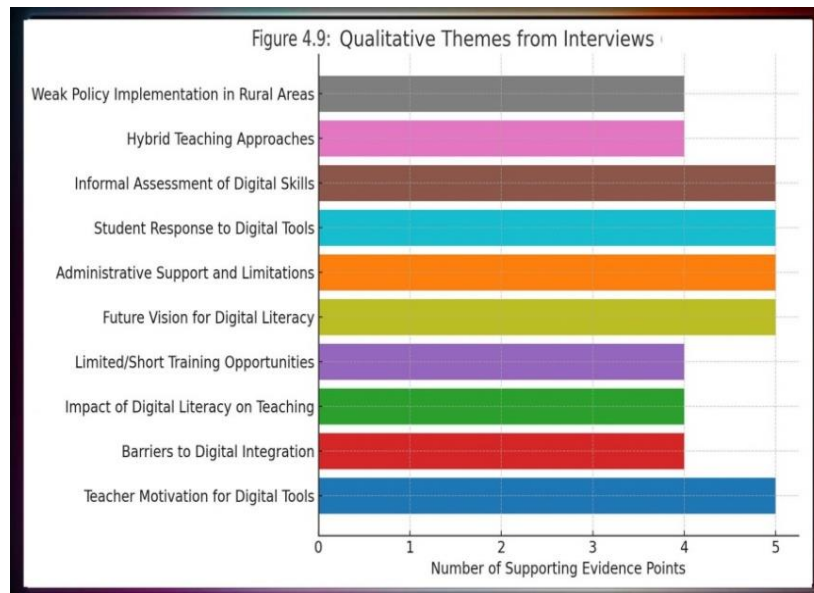


Figure 4.9: Qualitative themes from interviews

4.8. Availability & Condition of Resources

Table 4.30: Availability of Internet Connectivity

| Response Option | Frequency | Percentage |
|------------------------------|------------------|-------------------|
| Available | 11 | 17.5% |
| Not Available | 34 | 54.0% |
| No Answer | 2 | 3.2% |
| Available but not Functional | 15 | 23.8% |
| Available but not Accessible | 3 | 4.8% |
| Total | 63 | 100% |
| Mean | | 2.40 |

Table 4.30 Availability of Internet Connectivity. More than half of the schools (54.0%) reported that internet connectivity was not available, while 23.8% indicated that it existed but was non-functional. Only 17.5% had access to internet services. The mean score (M = 2.40) suggests poor availability and functionality of internet connectivity.

Table 4.31: Availability of Laptops/Desktops for Teachers

| Response Option | Frequency | Percentage |
|------------------------------|------------------|-------------------|
| Available | 3 | 4.8% |
| Not Available | 43 | 68.3% |
| No Answer | 8 | 12.7% |
| Available but not Functional | 7 | 11.1% |
| Available but not Accessible | 1 | 1.6% |
| Total | 63 | 100% |
| Mean | | 2.38 |

Table 4.31 Availability of Laptops/Desktops for Teachers. A majority of respondents (68.3%) reported no availability of laptops/desktops for teachers. Only 4.8% confirmed their availability, and 11.1% indicated they were present but non-functional. The mean score (M = 2.38) confirms severe lack of teacher devices across schools.

Table 4.32: Availability of Projectors

| Response Option | Frequency | Percentage |
|------------------------------|------------------|-------------------|
| Available | 19 | 30.2% |
| Not Available | 31 | 49.2% |
| No Answer | 1 | 1.6% |
| Available but not Functional | 6 | 9.5% |
| Available but not Accessible | 6 | 9.5% |
| Total | 63 | 100% |
| Mean | | 2.20 |

Table 4.32 Availability of Projectors. Almost half of the schools (49.2%) lacked projectors, while 30.2% had them available. However, about 19% reported them as either non-functional or inaccessible. The mean score ($M = 2.20$) shows projectors are relatively more available compared to other digital resources, but still inadequate.

Table 4.33: Availability of Learning Management System (LMS)

| Response Option | Frequency | Percentage |
|------------------------------|------------------|-------------------|
| Available | 10 | 15.9% |
| Not Available | 44 | 69.8% |
| No Answer | 3 | 4.8% |
| Available but not Functional | 4 | 6.3% |
| Available but not Accessible | 2 | 3.2% |
| Total | 63 | 100% |
| Mean | | 2.12 |

Table 4.33 Availability of Learning Management System (LMS). The majority (69.8%) of schools reported no LMS access, with only 15.9% confirming availability. The mean score ($M = 2.12$) indicates that LMS is the least available digital resource among surveyed institutions.

Table 4.34: Availability of Technical Support / IT Staff

| Response Option | Frequency | Percentage |
|------------------------------|-----------|-------------|
| Available | 3 | 4.8% |
| Not Available | 45 | 71.4% |
| No Answer | 6 | 9.5% |
| Available but not Functional | 4 | 6.3% |
| Available but not Accessible | 3 | 4.8% |
| Total | 63 | 100% |
| Mean | | 2.22 |

Table 4.34 Availability of Technical Support / IT Staff. A significant majority (71.4%) of schools reported no technical support or IT staff. Only 4.8% indicated availability, and about 11% had them but either non-functional or inaccessible. The mean score (M = 2.22) reflects a critical shortage of technical support across schools.

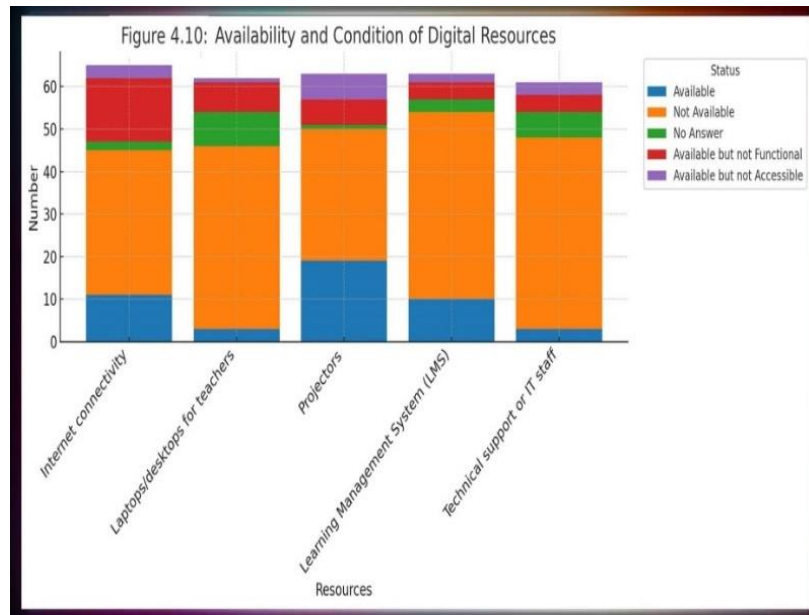


Figure 4.10: Availability and Condition of Digital Resources

4.9. Frequency of Digital Tool Use

Table 4.35: Frequency of PowerPoint / Presentation Tool Use

| Response Option | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Never | 15 | 23.8% |
| Rarely | 16 | 25.4% |
| Sometimes | 18 | 28.6% |
| Often | 7 | 11.1% |
| Always | 7 | 11.1% |
| Total | 63 | 100% |
| Mean | | 2.60 |

Table 4.35 Frequency of PowerPoint / Presentation Tool Use. PowerPoint or similar presentation tools were moderately used, with 28.6% reporting "sometimes" use and 22.2% using them regularly ("often" and "always"). However, nearly half (49.2%) reported either never or rarely using them. The mean score ($M = 2.60$) indicates limited but somewhat consistent adoption.

Table 4.36: Frequency of Online Assessment Tool Use (e.g., Google Forms)

| Response Option | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Never | 22 | 34.9% |
| Rarely | 11 | 17.5% |
| Sometimes | 14 | 22.2% |
| Often | 7 | 11.1% |
| Always | 8 | 12.7% |
| Total | 63 | 100% |
| Mean | | 2.50 |

Table 4.36 Frequency of Online Assessment Tool Use (e.g., Google Forms). Online assessment tools were among the least used, with 52.4% of teachers reporting "never" or "rarely" using them. A small proportion (23.8%) used them frequently ("often" or "always"). The mean score ($M = 2.50$) reflects their minimal integration into classroom practices.

Table 4.37: Frequency of Learning Management System (LMS) Use

| Response Option | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Never | 26 | 41.3% |
| Rarely | 7 | 11.1% |
| Sometimes | 16 | 25.4% |
| Often | 6 | 9.5% |
| Always | 6 | 9.5% |
| Total | 63 | 100% |
| Mean | | 2.37 |

Table 4.37 Frequency of Learning Management System (LMS) Use. The LMS was the least frequently used digital tool. More than half (52.4%) reported "never" or "rarely" using it, while only 19% used it consistently ("often" or "always"). The low mean score ($M = 2.37$) suggests poor adoption of structured digital learning platforms.

Table 4.38: Frequency of Communication App Use (WhatsApp, Zoom, etc.)

| Response Option | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Never | 12 | 19.0% |
| Rarely | 10 | 15.9% |
| Sometimes | 10 | 15.9% |
| Often | 9 | 14.3% |
| Always | 21 | 33.3% |
| Total | 63 | 100% |
| Mean | | 3.29 |

Table 4.38 Frequency of Communication App Use (WhatsApp, Zoom, etc.). Communication applications were the most widely used digital tools. About one-third (33.3%) reported "always" using them, and 14.3% reported frequent use. Only 19% never used them. The relatively high mean score ($M = 3.29$) highlights teachers' reliance on practical, accessible communication platforms for instructional purposes.

Table 4.39: Frequency of Multimedia Resource Use (YouTube, Simulations, etc.)

| Response Option | Frequency | Percentage |
|-----------------|-----------|-------------|
| Never | 14 | 22.2% |
| Rarely | 8 | 12.7% |
| Sometimes | 16 | 25.4% |
| Often | 12 | 19.0% |
| Always | 12 | 19.0% |
| Total | 63 | 100% |
| Mean | | 3.02 |

Table 4.39 Frequency of Multimedia Resource Use (YouTube, Simulations, etc.). Multimedia resources were fairly common, with 38% of teachers reporting frequent or constant use ("often" and "always"). However, 34.9% indicated little or no usage. The mean score (M = 3.02) reflects moderate adoption, suggesting teachers view multimedia as practical and engaging for students.

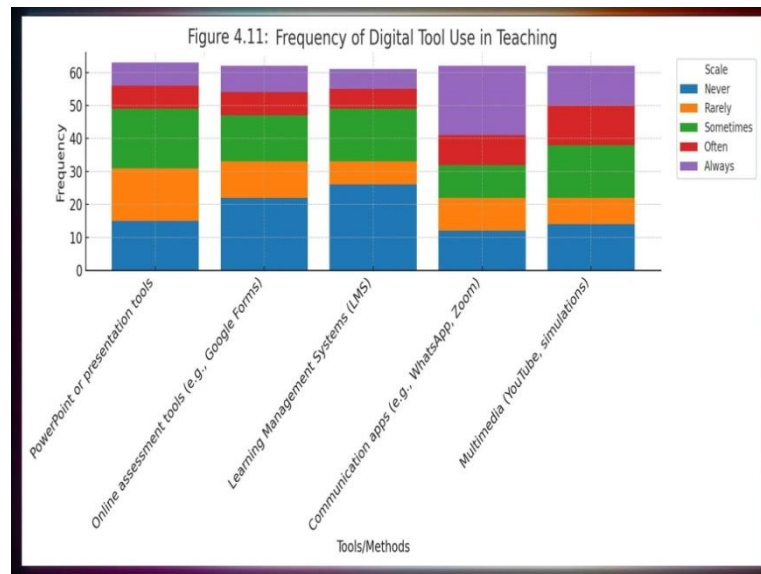


Figure 4.11: Frequency of Digital Tool Use in Teaching

4.10. Confidence & Competence

Table 4.40: Confidence in Using Digital Tools

| Response Option | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 4 | 6.3% |
| Disagree (D) | 5 | 7.9% |
| Neutral (N) | 2 | 3.2% |
| Agree (A) | 27 | 42.9% |
| Strongly Agree (SA) | 10 | 15.9% |
| Total | 63 | 100% |
| Mean | | 3.79 |

Table 4.40 Confidence in Using Digital Tools. A majority of teachers (58.8%) expressed confidence in using digital tools ("agree" or "strongly agree"), while only 14.2% reported a lack of confidence. The mean score ($M = 3.79$) indicates a generally high level of digital self-confidence.

Table 4.41: Competence in Troubleshooting Basic Technical Issues

| Response Option | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 10 | 15.9% |
| Disagree (D) | 9 | 14.3% |
| Neutral (N) | 14 | 22.2% |
| Agree (A) | 21 | 33.3% |
| Strongly Agree (SA) | 9 | 14.3% |
| Total | 63 | 100% |
| Mean | | 3.15 |

Table 4.41 Competence in Troubleshooting Basic Technical Issues. While 47.6% of teachers indicated they could handle basic troubleshooting ("agree" or "strongly agree"), nearly 30% admitted difficulty ("disagree" or "strongly disagree"). The mean score ($M = 3.15$) reflects only moderate technical problem-solving ability among teachers.

Table 4.42: Competence in Designing Digital Learning Activities

| Response Option | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 2 | 3.2% |
| Disagree (D) | 9 | 14.3% |
| Neutral (N) | 14 | 22.2% |
| Agree (A) | 25 | 39.7% |
| Strongly Agree (SA) | 14 | 22.2% |
| Total | 63 | 100% |
| Mean | | 3.62 |

Table 4.42 Competence in Designing Digital Learning Activities. Over 61.9% of teachers agreed they could design digital learning activities, while only 17.5% disagreed. The mean score ($M = 3.62$) demonstrates fairly strong competence in instructional design with digital tools.

Table 4.43: Staying Updated on New Digital Tools

| Response Option | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Strongly Disagree (SD) | 1 | 1.6% |
| Disagree (D) | 7 | 11.1% |
| Neutral (N) | 14 | 22.2% |
| Agree (A) | 26 | 41.3% |
| Strongly Agree (SA) | 15 | 23.8% |
| Total | 63 | 100% |
| Mean | | 3.75 |

Table 4.43 Staying Updated on New Digital Tools. A majority (65.1%) of teachers reported keeping up with new digital tools ("agree" or "strongly agree"), while only 12.7% disagreed. The mean score ($M = 3.75$) indicates strong awareness and willingness to remain digitally updated.

Table 4.44: Confidence in Helping Students with Digital Tools

| Response Option | Frequency | Percentage |
|------------------------|-----------|-------------|
| Strongly Disagree (SD) | 7 | 11.1% |
| Disagree (D) | 2 | 3.2% |
| Neutral (N) | 4 | 6.3% |
| Agree (A) | 30 | 47.6% |
| Strongly Agree (SA) | 19 | 30.2% |
| Total | 63 | 100% |
| Mean | | 3.84 |

Table 4.4 Confidence in Helping Students with Digital Tools. The majority of teachers (77.8%) felt comfortable supporting students with digital tools, with only 14.3% expressing a lack of confidence. The highest mean score (M = 3.84) across this section highlights strong teacher commitment to student digital learning support.

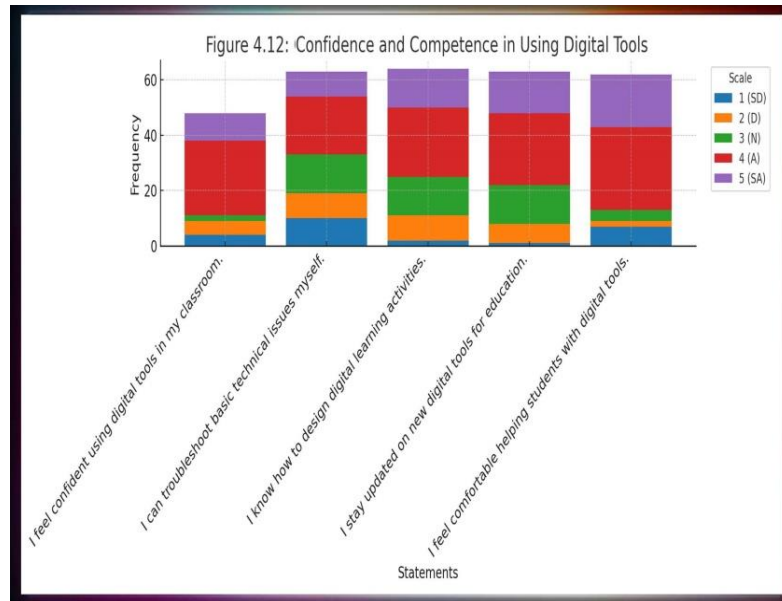


Figure 4.12: Confidence and Competence in Using Digital Tools

4.11. Challenges in Using Digital Tools

Table 4.45: Challenge: Lack of Internet or Electricity

| Response Option | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Not a Challenge | 7 | 11.1% |
| Minor | 8 | 12.7% |
| Moderate | 9 | 14.3% |
| Major | 20 | 31.7% |
| Very Severe | 19 | 30.2% |
| Total | 63 | 100% |
| Mean | | 3.57 |

Table 4.45 Challenge: Lack of Internet or Electricity. Over 61.9% of respondents rated lack of internet or electricity as a "major" or "very severe" challenge, with only 23.8% considering it minor or not a challenge. The mean score ($M = 3.57$) indicates it is one of the most pressing barriers to digital integration.

Table 4.46: Challenge: Lack of Training / Professional Development (PD)

| Response Option | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Not a Challenge | 10 | 15.9% |
| Minor | 6 | 9.5% |
| Moderate | 16 | 25.4% |
| Major | 18 | 28.6% |
| Very Severe | 13 | 20.6% |
| Total | 63 | 100% |
| Mean | | 3.28 |

Table 4.46 Challenge: Lack of Training / Professional Development (PD). A significant number of teachers (49.2%) viewed lack of training or professional development as a "major" or "very severe" challenge. However, 25.4% rated it only moderate, and 25.4% saw it as minor or not an issue. The mean score ($M = 3.28$) suggests training gaps remain a notable but not the most severe challenge.

Table 4.47: Challenge, Students' Lack of Access to Devices

| Response Option | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Not a Challenge | 2 | 3.2% |
| Minor | 6 | 9.5% |
| Moderate | 13 | 20.6% |
| Major | 20 | 31.7% |
| Very Severe | 22 | 34.9% |
| Total | 63 | 100% |
| Mean | | 3.86 |

Table 4.47 Challenge: Students' Lack of Access to Devices. An overwhelming 66.6% of respondents identified students' lack of access to devices as a "major" or "very severe" challenge, while only 12.7% considered it minor or insignificant. The mean score (M = 3.86) shows this is among the top barriers affecting digital learning.

Table 4.48: Challenge: Limited Time for Digital Lessons

| Response Option | Frequency | Percentage |
|------------------------|------------------|-------------------|
| Not a Challenge | 11 | 17.5% |
| Minor | 17 | 27.0% |
| Moderate | 12 | 19.0% |
| Major | 15 | 23.8% |
| Very Severe | 8 | 12.7% |
| Total | 63 | 100% |
| Mean | | 2.87 |

Table 4.48 Challenge: Limited Time for Digital Lessons. Time constraints were less critical compared to other challenges. Only 36.5% rated it as a "major" or "very severe" issue, while 44.5% saw it as minor or not a challenge. The mean score (M = 2.87) reflects that while time is a concern, it is not the primary barrier to digital adoption.

Table 4.49: Challenge: Lack of Technical Support

| Response Option | Frequency | Percentage |
|-----------------|-----------|-------------|
| Not a Challenge | 3 | 4.8% |
| Minor | 10 | 15.9% |
| Moderate | 7 | 11.1% |
| Major | 13 | 20.6% |
| Very Severe | 30 | 47.6% |
| Total | 63 | 100% |
| Mean | | 3.90 |

Table 4.49 Challenge: Lack of Technical Support. Nearly 68.2% of respondents rated the lack of technical support as a "major" or "very severe" challenge. Only 20.7% considered it minor or not a challenge. With the highest mean score ($M = 3.90$), technical support shortages represent the most critical obstacle to effective digital tool use.

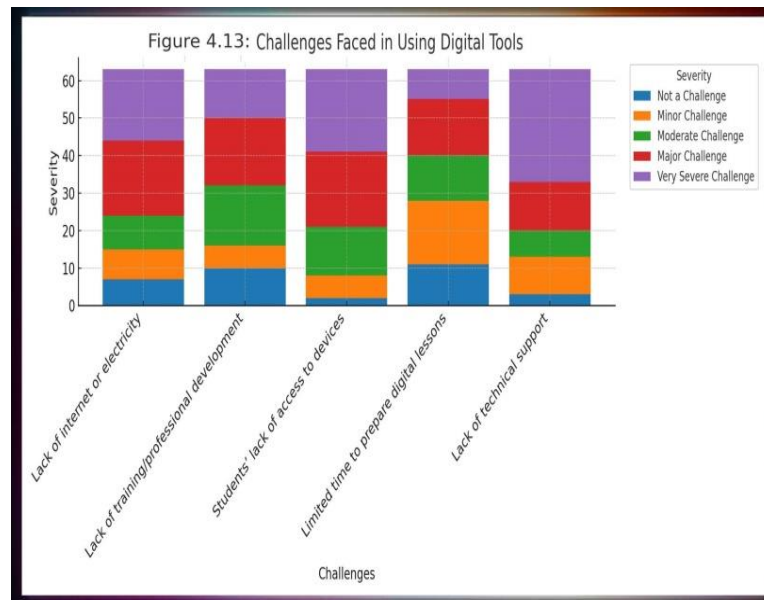


Figure 4.13: Challenges Faced in Using Digital Tools

4.12. Other Digital Tools Commonly Used

Table 4.50: Use of PowerPoint

| Response | Frequency | Percentage |
|-------------------------------|-----------|-------------|
| Teachers using PowerPoint | 28 | 44.4% |
| Teachers not using PowerPoint | 35 | 55.6% |
| Total | 63 | 100% |

Table 4.50 Use of PowerPoint. PowerPoint was used by 44.4% of teachers, making it a moderately adopted tool. While widely known, its usage indicates teachers are familiar with basic presentation tools, but adoption is not universal.

Table 4.51: Use of Google Classroom / LMS

| Response | Frequency | Percentage |
|---|-----------|-------------|
| Teachers using Google Classroom / LMS | 20 | 31.7% |
| Teachers not using Google Classroom / LMS | 43 | 68.3% |
| Total | 63 | 100% |

Table 4.51 Use of Google Classroom / LMS. Only 31.7% of teachers reported using LMS platforms such as Google Classroom. The majority (68.3%) did not use them, reflecting limited integration of structured online learning systems in secondary schools.

Table 4.52: Use of Zoom / Google Meet

| Response | Frequency | Percentage |
|---------------------------------------|-----------|-------------|
| Teachers using Zoom / Google Meet | 16 | 25.4% |
| Teachers not using Zoom / Google Meet | 47 | 74.6% |
| Total | 63 | 100% |

Table 4.52 Use of Zoom / Google Meet. Video conferencing tools like Zoom and Google Meet were used by only 25.4% of teachers. Limited adoption may reflect infrastructural challenges such as poor connectivity and lack of familiarity with synchronous digital platforms.

Table 4.53: Use of WhatsApp / Messenger

| Response | Frequency | Percentage |
|---|-----------|-------------|
| Teachers using WhatsApp / Messenger | 48 | 76.2% |
| Teachers not using WhatsApp / Messenger | 15 | 23.8% |
| Total | 63 | 100% |

Table 4.53 Use of WhatsApp / Messenger. WhatsApp and Messenger were highly popular, used by 76.2% of teachers. These apps' accessibility, familiarity, and low cost make them preferred tools for communication and resource sharing.

Table 4.54: Use of Kahoot / Quizzes

| Response | Frequency | Percentage |
|-------------------------------------|-----------|-------------|
| Teachers using Kahoot / Quizzes | 14 | 22.2% |
| Teachers not using Kahoot / Quizzes | 49 | 77.8% |
| Total | 63 | 100% |

Table 4.54 Use of Kahoot / Quizzes. Only 22.2% of teachers reported using gamified learning tools like Kahoot. Their limited use suggests barriers such as lack of training or awareness about interactive, game-based digital resources.

Table 4.55: Use of YouTube / Educational Videos

| Response | Frequency | Percentage |
|---|-----------|-------------|
| Teachers using YouTube / Educational Videos | 56 | 88.9% |
| Teachers not using YouTube / Educational Videos | 7 | 11.1% |
| Total | 63 | 100% |

Table 4.55 Use of YouTube / Educational Videos. YouTube was the most widely used tool, adopted by 88.9% of teachers. Its ease of access, free content, and diverse educational resources make it a highly effective digital platform for classroom use.

Table 4.56: Use of Tablets / iPads

| Response | Frequency | Percentage |
|------------------------------------|-----------|-------------|
| Teachers using Tablets / iPads | 26 | 41.3% |
| Teachers not using Tablets / iPads | 37 | 58.7% |
| Total | 63 | 100% |

Table 4.56 Use of Tablets / iPads. Tablets and iPads were moderately used (41.3%). While useful for interactive learning, their limited presence reflects affordability and accessibility issues in schools.

Table 4.57: Use of Other Digital Tools

| Response | Frequency | Percentage |
|--|-----------|-------------|
| Teachers using Other Digital Tools | 20 | 31.7% |
| Teachers not using Other Digital Tools | 43 | 68.3% |
| Total | 63 | 100% |

Table 4.57 Use of Other Digital Tools. About 31.7% of teachers used other unspecified digital tools, reflecting some diversity in practices. However, the majority (68.3%) did not; highlighting reliance on only a few dominant tools like YouTube and WhatsApp.

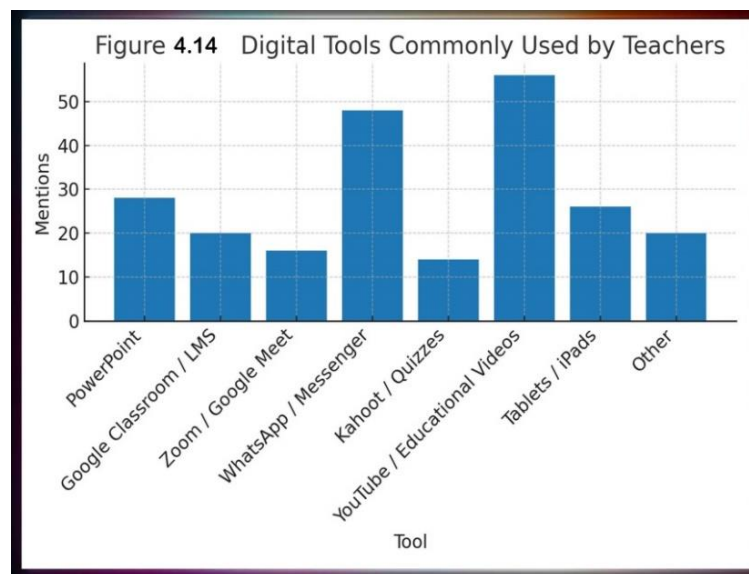


Figure 4.14: Digital Tools Commonly Used by Teachers

4.13. Summary of the Chapter

Strengths: High motivation and positive attitudes; clear perceived impact on learning and teaching effectiveness.

Gaps: Infrastructure, LMS adoption, technical support, sustained hands-on training, and administrative push.

Implication: Prioritize reliable infrastructure, on-site technical support, and mentored CPD with classroom-embedded practice.

CHAPTER 5

SUMMARY, FINDINGS, DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1. Summary

This chapter presents a comprehensive overview of the study by summarizing its objectives, research questions, and major findings. The discussion interprets the results in light of existing literature, offering a deeper understanding of digital literacy practices among secondary school teachers in District Chaman, Baluchistan. The chapter further draws conclusions, proposes recommendations for different stakeholders, and highlights implementation strategies, monitoring mechanisms, and limitations of the study.

It restates the objectives and research questions of this study to alert readers to the guiding goals of the inquiry and to establish a clear point of reference for the findings and conclusions that are about to be presented. Repetition at the beginning of the chapter of these guiding statements ensures that every subsequent claim can easily be traced back to the initial goals of the research, enhancing coherence and evaluative transparency.

The key aims of this research are to assess the digital literacy contingency level of the secondary school teachers in Baluchistan's District Chaman. To assess the effectiveness of existing teacher training programs in facilitating digital literacy. To identify the digital tools and materials most used by teachers in their instructional practices. While key research questions of the study are; What is the level of digital literacy contingency among secondary school teachers of Chaman, Baluchistan? What digital resources and tools are used most commonly by teachers? What skills are imparted by teacher training programs in enhancing digital literacy? What are the challenges and barriers confronted by teachers in adopting digital literacy practices?

The findings of the research demonstrate that although teachers in Chaman have a minimum level of digital literacy, their skills are usually influenced by situational constraints like poor internet speeds, poor infrastructure, and lack of access to sophisticated devices. Teachers use mainly low-bandwidth and user-friendly tools like WhatsApp, PowerPoint, and YouTube for educational purposes.

Staff training courses, while available, tend to stress technical acquaintance over pedagogical incorporation. Teachers showed willingness to enhance their competences but told that present workshops were temporary, theory-oriented, and devoid of follow-up coaching. The results also suggested that teachers' motivation to use digital tools was high, but organizational barriers impeded ongoing digital practices.

5.2. Findings of the study

This section presents the principal findings of the study, explicitly linked to research questions and objectives. Quantitative results are supplemented with qualitative insights to provide a nuanced interpretation.

5.2.1. Findings Quantitative Data

1. The majority of teachers in Chaman are male (84.1%). Most are aged 31–40 years (47.6%) and have 5–15 years of teaching experience.
2. About 74.6% of teachers feel confident using digital tools, while nearly 20% lack confidence. Around 87.3% can find and use online educational materials effectively.
3. Nearly 77.8% understand basic digital skills such as file management and internet safety. About 69.8% regularly use digital tools, and 82.6% agree that digital literacy is essential in today's world.
4. Only 52.4% found training programs provided enough practical exposure. About 53.9% felt training prepared them for digital teaching, but one-third disagreed. Only 44.4% received adequate support or mentorship. Around 60.4% said training covered rural challenges, though not in detail.

5. About 57.1% agreed that training meets modern digital teaching needs. Around 68.3% said schools encourage digital tool use. However, 50.8% disagreed that their schools have adequate digital resources. A large majority (82.5%) actively work on improving their digital literacy.
6. Nearly 79.4% guide students on responsible digital use. Only 46.1% felt the government prioritizes digital literacy. About 85.7% said digital tools improve teaching effectiveness, and 82.6% agreed they make lessons more engaging. Around 74.6% found digital tools helpful for classroom management.
7. Most teachers (85.7%) believe digital tools enhance learning outcomes. Around 69.8% said they support inclusive education. A large majority (88.9%) are positive about adopting new tools. About 93.6% agreed digital literacy builds professional skills, and 88.9% feel motivated to explore new technologies. Roughly 85.7% said digitally skilled teachers deliver better lessons.
8. Only 41.2% felt supported by school administrations to use digital tools. Over half the schools (54%) had no internet, 23.8% had poor connectivity, and only 17.5% had reliable access. About 68.3% had no laptops or desktops for teachers. Nearly half (49.2%) lacked projectors, and 19% said available ones were non-functional. Around 69.8% had no LMS, and only 15.9% had access.
9. Technical staff were absent in 71.4% of schools, with only 4.8% having IT support. About 49.2% rarely used PowerPoint or similar tools, while only 22.2% used them often. More than half (52.4%) seldom used online assessment tools like Google Forms or LMS platforms. Communication apps (e.g., WhatsApp, Zoom) were the most used, with 33.3% using them regularly.
10. Multimedia tools (e.g., YouTube, simulations) were moderately used by 38% of teachers. About 58.8% were confident in using digital tools, while 14.2% were not. Nearly half (47.6%) could fix basic technical problems, though 30% struggled. Around 61.9% could design digital learning activities, and 65.1% stayed updated on new tools.

11. About 77.8% felt confident helping students with digital tools. A majority (61.9%) reported internet and electricity shortages as major issues. Nearly half (49.2%) cited lack of training as a serious challenge. About 66.6% said students' limited access to devices was a major concern. Time was less of a problem, with 44.5% calling it minor. The most severe issue was lack of technical support (68.2%).
12. Only 31.7% used Google Classroom or other LMS platforms. About 25.4% used video conferencing tools like Zoom. WhatsApp and Messenger were the most used (76.2%). Gamified learning tools (e.g., Kahoot) were rarely used (22.2%). YouTube was the most popular platform (88.9%). Tablets or iPads were used by 41.3% of teachers. Only 31.7% used other digital tools, while 68.3% did not.

5.2.2. Findings Qualitative Data

1. Teachers showed strong motivation to use digital tools. They believed technology increases student interest, provides visual and animated explanations, saves time, expands learning resources, and prepares students for future skills.
2. Major barriers to digital integration included unreliable electricity and internet, limited access to devices, insufficient advanced training, and difficulties caused by the English-language barrier.
3. Teachers viewed digital literacy as improving teaching quality by enabling differentiated instruction, increasing engagement, speeding up assessments, and providing access to updated learning materials.
4. Training opportunities were limited. Most teachers reported attending only short workshops, one-day NGO sessions, webinars, or relying on peer support and self-learning.
5. Teachers envisioned a future with reliable internet, modern digital classrooms, continuous professional development (CPD), subject-wide integration, and strong public-private partnerships (PPPs) to support digital literacy.

6. Administrative support existed but was minimal—mostly limited to verbal encouragement, occasional provision of printers or internet, basic training, and donor collaborations constrained by low budgets.
7. Students generally responded positively to digital tools, showing greater interest, collaboration, and independence in research, though some displayed mixed readiness and distractions.
8. Teachers informally assessed students' digital skills through practical tasks, project work, observation of software use, and evaluation of digital sources, instead of using standardized tools.
9. Hybrid teaching was common, combining traditional chalk-and-talk with digital methods. Teachers adjusted approaches based on lesson content and used fully digital lessons when possible.
10. Weak policy implementation was noted in rural areas. Teachers said that although digital literacy policies exist, execution is inconsistent, support is irregular, post-COVID efforts have slowed, and teachers have little input in policymaking.

5.3. Discussions

Teachers in Chaman increasingly recognize the pedagogical potential of digital technologies and generally hold positive attitudes toward their use. In line with Koumi (2020), the use of video, visual aids, and mobile-compatible materials enhances student participation and understanding. Teachers in Chaman report similar benefits when using platforms such as YouTube and WhatsApp. Their foundational digital skills—including file management, internet browsing, and online research—align with the digital competence framework described by Gudmundsdottir and Hatlevik (2020). However, confidence in advanced applications and troubleshooting remains uneven, creating a developmental gap that limits deeper classroom innovation.

This study interprets findings through a combined TPACK and sociocultural lens. While teachers possess knowledge of and positive attitudes toward digital technologies

(TPACK), their ability to apply these skills is shaped by contextual factors such as administrative support, infrastructure, and students' prior technological experience. According to the conceptual framework, teachers' skills and working conditions interact to shape digital literacy practices, which are context-dependent and flexible rather than solely knowledge- or motivation-based.

A major limitation identified is the lack of ongoing professional development. Consistent with Ilomäki et al. (2016), short, tool-focused workshops are insufficient for developing sustained digital literacy. In Chaman, teachers rely heavily on informal peer support and self-directed learning due to the absence of formal training programs or mentoring systems. Almaiah et al. (2021) highlight the value of mobile learning in resource-constrained settings, reflected locally in teachers' reliance on low-bandwidth platforms such as YouTube and WhatsApp. While these tools facilitate basic digital participation, they limit the breadth and depth of pedagogical innovation compared to institutional Learning Management Systems (LMS).

Infrastructure remains a persistent constraint. Following Ndlovu and Shava (2022), teachers face unreliable electricity, poor internet, and insufficient functional devices, which restrict the use of advanced digital tools. Consequently, teachers often adopt hybrid approaches, combining traditional chalk-and-talk with occasional digital integration, consistent with adaptive strategies noted by Ertmer and Ottenbreit-Leftwich (2020). Although these strategies sustain motivation, they fall short of the full digital integration advocated in international frameworks.

Motivation among teachers is strong: they consistently report improved student engagement, classroom effectiveness, and differentiated instruction when online resources are used meaningfully, echoing Bond (2020) and Martin and Bolliger (2020). However, structural barriers, including limited infrastructure and inadequate leadership follow-through, constrain large-scale adoption, a finding aligned with UNESCO (2018) and Reddy et al. (2020). Leadership support is present but limited; although policymakers and school leaders express intent, actual provision of incentives, facilities, and teacher input is minimal, reflecting gaps noted by Azorín et al. (2020).

Overall, the study highlights a motivated, resilient, and capable teaching force in Chaman that is eager to integrate digital technologies but remains constrained by infrastructural limitations, lack of professional development, and insufficient organizational support. Unlike findings in other literature emphasizing gender disparities (UNESCO, 2021; Hilbert, 2020), this study found no gender-based differences, suggesting that systemic and infrastructural barriers are the primary challenges. The intersection of global and local findings indicates that, while teachers in Chaman face similar issues to other rural contexts, their adaptive resilience provides a strong foundation for sustainable digital integration if supported by targeted training, reliable infrastructure, and committed leadership.

5.4. Conclusions

1. The key findings of the study can be summarized as follows to show how digital literacy practices advance within actual school frameworks in Chaman:
2. Teachers in District Chaman generally have basic digital skills, such as browsing the internet, using email, and operating standard software, but their ability to create digital content, manage LMS platforms, or use interactive and gamified tools is limited. They rely heavily on mobile phones, especially applications like WhatsApp and YouTube, to communicate with students, share learning materials, and access online resources.
3. The teaching workforce is mostly male (84.1%) and mid-career, mainly aged 31–40 years with 5–15 years of experience. They demonstrate basic digital competence and positive attitudes toward technology but face limited institutional and infrastructural support. Teachers recognize the importance of digital literacy for modern education and see digital tools as helpful in increasing student engagement, improving lesson quality, and enhancing learning outcomes.
4. Most teachers develop their digital skills through self-learning because professional development programs are limited, short-term, and often do not match the realities of rural classrooms. Exposure to ICT and online training has improved their confidence, but these programs lack practical, context-specific components, reducing their effectiveness. Teachers are gradually adopting hybrid teaching methods, combining traditional approaches with digital tools, which shows their adaptability despite resource constraints.

5. However, many challenges remain. Schools often have unreliable electricity, poor internet connectivity, limited devices, minimal technical support, and few advanced platforms like LMS. Administrative support is low, and national digital literacy policies are inconsistently implemented, with little teacher input and slow post-COVID progress.
6. Overall, teachers in Chaman have foundational digital skills, motivation, and positive attitudes toward technology, but sustainable progress requires better infrastructure, continuous training tailored to rural contexts, stronger institutional support, and effective implementation of policies to ensure meaningful and equitable use of digital tools in secondary education.

5.5. Recommendations

The study's conclusions suggest practical recommendations to enhance digital literacy among secondary school teachers in rural areas. Effective digital integration requires coordinated efforts from multiple stakeholders, focusing on infrastructure, teacher training, school practices, community engagement, government support, and future research.

1. National digital literacy policies should be translated into actionable, context-specific plans with measurable targets, adequate funding, and active teacher participation to ensure sustainability and local ownership.
2. Core infrastructure in rural schools must be strengthened, including reliable electricity, stable internet connectivity, and access to affordable digital devices.
3. Public-private partnerships and collaborations with telecom companies and NGOs should be expanded to ensure long-term access to devices, internet packages, and digital platforms for rural schools.
4. Teacher training programs should shift from short-term workshops to continuous, school-based professional development that emphasizes practical, hands-on experiences, peer mentoring, and problem-solving in real classroom contexts.
5. Professional development must include advanced digital literacy skills such as troubleshooting, instructional design, formative digital assessment, and hybrid or online teaching strategies tailored to rural environments.

6. Schools should develop digital readiness plans, appoint digital focal persons, allocate time for collaborative lesson planning, and provide incentives to encourage innovation and peer mentoring.
7. Technical support systems should be established within schools or clusters, training IT focal points to maintain digital tools, reduce teacher workload, and minimize disruptions in teaching.
8. Recognition, reward, and career advancement opportunities should be linked to effective digital integration, motivating teachers to embed digital practices in classroom teaching.
9. Teachers should use accessible, low-bandwidth tools such as SMS, WhatsApp, or offline applications for formative assessments to track student progress inclusively.
10. Learner-centered digital literacy programs should be expanded to promote responsible technology use, digital citizenship, research skills, collaboration, and independent learning, supported by guided teacher assistance.

Overall, these recommendations emphasize that improving digital literacy in rural schools is a multifaceted challenge. Success requires not only technology and training but also supportive policies, robust infrastructure, motivated teachers, engaged communities, and ongoing research. Implementing these measures can make digital learning equitable, sustainable, and effective for both teachers and students.

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ANNEXURE I

Questionnaire for Teachers

Title of the Research: EXPLORING CONTINGENCY IN DIGITAL LITERACY PRACTICES OF SECONDARY SCHOOL TEACHERS IN QUETTA, BALUCHISTAN

This research aims to study the digital literacy practices existing in District Chaman; the ethnic diversity of District Chaman offers a distinctive setting for examining how teachers use digital tools in their teaching. The study also aims to explore how digital literacy is included or excluded into the classroom practices, how it is used to enhance educational experiences of students. Instead of being restricted to technical competence, digital literacy is seen in this study as a more comprehensive construct that reflects the common practices, opinions, communication styles, and lifestyles of many clusters within the educational community about the use of digital tools for teaching purposes.

Researcher would like to ensure that all participants' names will be kept completely confidential, and the information gathered will only be used for research purposes. We respectfully ask that you answer the following questions to the best of your knowledge and expertise. Researcher would like to appreciate your kind support in the completion of study.

Yours Sincerely,

Siraj Ud Din

M.S. (Education) Scholar

Demographic Information about Participants:

Section A: Demographic Information

Name (Optional): _____

Please tick (✓) the appropriate box

| Age: | 20-25 | 26-30 | 31-35 | 36-40 | 41-45 | 46-50 | 51-55 | 56-60 |
|-------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | | | | | | | | |

Please tick (✓) the appropriate box

Gender: **Male** **Female**

Designation: _____

Please tick (✓) the appropriate box

| Years of Teaching Experience | 5-10 | 11-15 | 16-20 | 21-25 | 26-30 | 31-35 |
|-------------------------------------|-------------|--------------|--------------|--------------|--------------|--------------|
| | | | | | | |

School Name (Optional): _____

Please read each statement carefully and specify your level of agreement by using the scale explained below:

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

Section B: Digital Literacy

| Item No | Statement | 1 | 2 | 3 | 4 | 5 |
|----------------|--|----------|----------|----------|----------|----------|
| 1 | I feel confident in using digital tools such as computers, tablets, and smartphones for teaching purposes. | | | | | |
| 2 | I can easily find and use educational resources from the | | | | | |

| | | | | | | |
|---|---|--|--|--|--|--|
| | internet. | | | | | |
| 3 | I understand basic digital concepts such as file management, data storage, and internet safety. | | | | | |
| 4 | I use digital tools regularly in my personal or professional life. | | | | | |
| 5 | I believe digital literacy is an essential skill for teachers during 21st-century. | | | | | |

Section C: Current Teacher Training Programs

| Item No | Statement | 1 | 2 | 3 | 4 | 5 |
|----------------|--|----------|----------|----------|----------|----------|
| 1 | Teacher training programs I have attended included practical use of digital tools. | | | | | |
| 2 | The training sessions prepared me to integrate digital technology in the classroom. | | | | | |
| 3 | I have received adequate support or mentorship during digital training sessions by resource persons. | | | | | |
| 4 | Training programs I have attended addressed the challenges faced by teachers in using technology in rural schools. | | | | | |
| 5 | I believe current teacher training programs are aligned with modern digital teaching needs. | | | | | |

Section D: Promoting Digital Literacy

| Item No | Statement | 1 | 2 | 3 | 4 | 5 |
|----------------|--|----------|----------|----------|----------|----------|
| 1 | My school encourages the use of digital tools for teaching and learning. | | | | | |
| 2 | There are enough resources available at my school to promote digital literacy (e.g., internet, computers). | | | | | |
| 3 | I actively try to improve my digital literacy skills | | | | | |

| | | | | | | |
|---|---|--|--|--|--|--|
| | through self-learning or training programs. | | | | | |
| 4 | I guide my students to use digital tools responsibly and effectively. | | | | | |
| 5 | I believe the government has a particular focus on promoting digital literacy at schools. | | | | | |

Section E: Significance for Teaching

| Item No | Statement | 1 | 2 | 3 | 4 | 5 |
|---------|--|---|---|---|---|---|
| 1 | Using digital tools helps me to teach more effectively. | | | | | |
| 2 | Digital technology makes lessons more engaging and interactive for students. | | | | | |
| 3 | Digital literacy helps me to manage classroom tasks more efficiently. | | | | | |
| 4 | Teaching with digital tools enhances student learning outcomes. | | | | | |
| 5 | Integrating digital tools supports inclusive education for diverse learners. | | | | | |

Section F: Perceptions of Teachers towards Digital Literacy

| Item No | Statement | 1 | 2 | 3 | 4 | 5 |
|---------|--|---|---|---|---|---|
| 1 | I have a positive attitude toward learning and using new digital tools in any classroom. | | | | | |
| 2 | I believe digital literacy can improve my professional skills. | | | | | |
| 3 | I am motivated to explore new technologies for effective teaching. | | | | | |
| 4 | Digitally literate teachers can teach effectively in the classroom. | | | | | |

| | | | | | | |
|---|--|--|--|--|--|--|
| 5 | School administration always motivates teachers to use digital tools in the classroom. | | | | | |
|---|--|--|--|--|--|--|

Interview Guide

Interview Questions:

1. What motivates you to use digital tools in your classroom?

.....
.....
.....

2. What barriers have you faced in using digital tools?

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.....
.....

3. How does digital literacy affect your teaching effectiveness?

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.....
.....

4. What type of training have you received for using digital tools?

.....
.....
.....

5. What is your vision for the future of digital literacy in school education sector in Chaman?

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.....

6. What support have you received from your school administration regarding use of digital tools?

.....
.....
.....

7. How do your students respond to the use of digital tools?

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.....
.....

8. How do you assess students' digital literacy skills?

.....
.....
.....

9. How do you balance traditional teaching methods with digital tools?

.....
.....
.....

10. What role do government policies play in promoting digital literacy among teachers?

.....

.....

.....

ANNEXURE III

Observations Checklist

Section A: Availability of Digital Resources

Scale:

1 = Available, 2 = Not Available, 3 = No Answer, 4 = Available but not Functional, 5 = Available but not Accessible

Instructions: Please select the option that best describes the availability and condition of the following resources in your school.

| Item No | Statement | 1 | 2 | 3 | 4 | 5 |
|---------|---|---|---|---|---|---|
| 1 | Internet connectivity | | | | | |
| 2 | Laptops or desktop computers for teachers | | | | | |
| 3 | Projectors | | | | | |
| 4 | Learning Management System (e.g., LMS) | | | | | |
| 5 | Technical support or IT staff | | | | | |

Section B: Frequency of Digital Tool Use

Scale:

1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Always

Instructions: Please indicate how often you use the following digital tools or methods in your teaching practices.

| Item No | Statement | 1 | 2 | 3 | 4 | 5 |
|---------|--|---|---|---|---|---|
| 1 | PowerPoint or other presentation tools | | | | | |
| 2 | Online assessment tools (e.g., Google Forms) | | | | | |
| 3 | Learning Management Systems (LMS) (e.g., Google Classroom) | | | | | |

| | | | | | | |
|---|---|--|--|--|--|--|
| 4 | Communication apps (e.g., WhatsApp, Zoom) | | | | | |
| 5 | Multimedia resources (e.g., YouTube, simulations) | | | | | |

Section C: Confidence and Competence in Using Digital Tools

Scale:

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

Instructions: Please indicate your level of agreement with the following statements.

| Item No | Statement | 1 | 2 | 3 | 4 | 5 |
|---------|---|---|---|---|---|---|
| 1 | I feel confident using digital tools in my classroom. | | | | | |
| 2 | I can troubleshoot basic technical issues myself. | | | | | |
| 3 | I know how to design digital learning activities. | | | | | |
| 4 | I stay updated on new digital tools for education. | | | | | |
| 5 | I feel comfortable helping students with digital tools. | | | | | |

Section D: Challenges in Using Digital Tools

Scale:

1 = Not a Challenge, 2 = Minor Challenge, 3 = Moderate Challenge,

4 = Major Challenge, 5 = Very Severe Challenge

Instructions: Please rate the extent to which the following are challenges in your use of digital tools.

| Item No | Statement | 1 | 2 | 3 | 4 | 5 |
|---------|--|---|---|---|---|---|
| 1 | Lack of internet or electricity | | | | | |
| 2 | Lack of training or professional development | | | | | |
| 3 | Students' lack of access to devices | | | | | |
| 4 | Limited time to prepare digital lessons | | | | | |
| 5 | Lack of technical support | | | | | |

Section E: **Any other Digital Tools Commonly Used**

Instructions: Please tick (✓) the digital tools you commonly use.

(You may choose more than one.)

| Item No | Statement | (<input checked="" type="checkbox"/>) |
|---------|------------------------------|---|
| 1 | PowerPoint | (<input type="checkbox"/>) |
| 2 | Google Classroom / LMS | (<input type="checkbox"/>) |
| 3 | Zoom / Google Meet | (<input type="checkbox"/>) |
| 4 | WhatsApp / Messenger | (<input type="checkbox"/>) |
| 5 | Kahoot / Quizzes | (<input type="checkbox"/>) |
| 6 | YouTube / Educational Videos | (<input type="checkbox"/>) |
| 7 | Tablets / iPads | (<input type="checkbox"/>) |
| 8 | Other: | (<input type="checkbox"/>) |