
Unveiling the Divide: Teachers' Voices on ICT Access and Usage Barriers in Schools

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Abstract

This phenomenological study investigates the lived experiences of teachers regarding Information and Communication Technology (ICT) access and usage barriers in schools within the Philippine educational context. Through in-depth semi-structured interviews with seven teachers, this research employs thematic analysis to identify key challenges including limited infrastructure, inadequate training, poor internet connectivity, and insufficient technological resources. The findings reveal four main themes: Emotional Experiences and Challenges, Holistic Learning Experience, Psychophysiological Responses, and Active Learning Strategies. Despite facing significant barriers, teachers demonstrated remarkable resilience through adaptive coping mechanisms such as utilizing personal devices, implementing traditional backup methods, and fostering collaborative support networks. The study provides actionable recommendations for policymakers, school administrators, and educators to enhance ICT infrastructure, provide sustained professional development, and bridge the digital divide in Philippine schools. This research underscores the critical importance of including teacher voices in ICT policymaking to ensure effective technology integration that genuinely supports teaching and learning.

Keywords: ICT access barriers, teachers' experiences, digital divide, phenomenological study, technology integration, educational technology, professional development

1. Introduction

The integration of Information and Communication Technology (ICT) in education has become increasingly essential in the 21st century, transforming teaching methodologies and enhancing learning experiences globally [1] [2]. However, despite widespread recognition of ICT's potential to revolutionize education, significant barriers persist in its effective implementation, particularly in developing countries like the Philippines [3] [4]. The digital divide in education refers to the inequity in student and teacher access to technology, encompassing not only physical access to devices and internet connectivity but also the digital literacy skills necessary to utilize them effectively [5] [6].

In the Philippine context, the Department of Education (DepEd) has launched various initiatives to promote ICT integration, including the DepEd Computerization Program (DCP) and mandatory training on productivity tools such as Microsoft 365 [4] [7]. However, these efforts have been met with varying degrees of success, as teachers continue to face substantial challenges in accessing and effectively utilizing ICT resources in their classrooms.

Understanding these challenges from the perspective of teachers, the primary implementers of educational technology—is crucial for developing effective policies and interventions. The COVID-19 pandemic further highlighted the critical importance of ICT in education while simultaneously exposing the deep-rooted inequalities in technological access and infrastructure [4] [6]. The sudden shift to remote learning revealed that many schools, particularly in rural and underserved areas, lacked the necessary resources, stable internet connectivity, and teacher preparedness to deliver quality digital education. These challenges underscore the urgent need for comprehensive research that captures teachers lived experiences with ICT access and usage barriers.

Research on ICT integration in education has traditionally focused on cognitive and technical dimensions [3] [8]. However, recent paradigms emphasize the importance of exploring adoption of technology as a holistic process that encompasses emotional, social, and contextual factors [9] [10]. A phenomenological approach allows researchers to delve deeply into teachers' subjective experiences, perceptions, and challenges, providing rich insights that quantitative methods alone cannot capture [11] [10] [12].

The barriers to ICT integration are complex and interconnected. Studies across various developing countries have identified common challenges including lack of infrastructure and equipment, insufficient teacher training, poor internet connectivity, limited technical support, outdated hardware and software, and resistance to change [3] [13] [14] [15]. In the Philippine setting specifically, teachers encounter unique contextual challenges such as geographical remoteness, socio-economic disparities, and regional variations in resource allocation [4] [7]. Teacher readiness and digital literacy play crucial roles in the success of ICT integration initiatives [4] [7]. Many teachers, particularly those in rural schools, lack adequate training in both technical skills and pedagogical approaches to effectively integrate technology into their teaching practices. This gap between policy intentions and classroom realities creates frustration and underutilization of available technological resources [3] [15] [16].

The social and organizational context within which teachers operate significantly influences their ability to adopt and sustain ICT use [15] [16]. Factors such as administrative support, collaborative cultures among colleagues, availability of technical assistance, and institutional policies all shape teachers' experiences with technology. Schools with stronger structural and cultural support systems demonstrate higher frequencies of educational ICT utilization [16]. This phenomenological study seeks to address the gap in understanding teachers lived experiences with ICT access and usage barriers in Philippine schools. Acknowledging voice of teachers' perspectives, challenges, and coping strategies, this research aims to inform evidence-based policy recommendations and practical interventions that can bridge the digital divide and enhance technology integration in education. The main research question guiding this study is, **What are the lived experiences of teachers regarding ICT access and usage barriers in schools, and how do they encompass these challenges?**

Objectives of the Study

This research aimed to provide a comprehensive and nuanced understanding of how teachers experience ICT access and usage barriers in Philippine schools. Specifically, this study sought to answer the following research questions:

1. What types of ICT training and professional development have teachers received, and how effective were these training programs in preparing them for classroom technology integration?
2. What specific challenges and barriers do teachers encounter when accessing and utilizing ICT resources in their schools?
3. How do ICT access barriers impact teachers' instructional practices and students' learning experiences?
4. What coping strategies, adaptations, and innovations have teachers developed to compensate for limited ICT resources?
5. What recommendations do teachers have for improving ICT infrastructure, training, and support systems in schools?

Methodology

Research Design

The research design utilized in this for this study is a qualitative phenomenological approach. Given the goal of comprehending the subjective experiences of teachers during their journey of accessing and using ICT in schools, a qualitative approach is well-suited [11] [10] [12]. Phenomenological research facilitates a thorough investigation of participants lived experiences and individual perspectives, yielding valuable insights into the complexities of technology integration from their distinct vantage points [9] [10].

As researchers Creswell (2013) and Moustakas (1994) have emphasized, the significance of phenomenology lies in exploring human experiences and understanding the essence of a phenomenon [11] [10]. The phenomenological approach seeks to delve into the meaning of a lived experience by analyzing how individuals perceive and interpret the world around them [12]. By adopting this approach, the study illuminates the nuanced factors of ICT access and usage, highlighting how teachers' perceptions, emotions, and actions influence their technology integration process.

This study aligns with the interpretivist paradigm, which recognizes that reality is socially constructed and that multiple perspectives exist on any given phenomenon [15]. The phenomenological method is particularly suited to educational research as it allows researchers to engage in flexible activities that can describe and help understand complex phenomena, such as various aspects of human social experience in technology-rich environments [9] [17].

Participants and Sampling

This study employed a purposive sampling approach to enlist seven (7) teachers who have direct experience with ICT access and usage in their schools. These participants were selected based on specific criteria, including their current teaching position, involvement in ICT-related activities, and willingness to share their experiences. Using purposive sampling, the research intentionally targets individuals with relevant insights and experiences related to the subject under investigation.

The seven teacher-participants represented diverse teaching experiences, ranging from 1 year to 7 years in the Philippine Department of Education (DepEd) system. This diversity enriched the study's findings by offering various perspectives on ICT access and usage challenges across

different career stages. The participants included both general classroom teachers and ICT coordinators, providing a comprehensive view of technology integration from multiple roles within the school system. By carefully considering these criteria, the research ensured that the chosen participants possessed the necessary knowledge and experiences to effectively express their encounters with ICT access and usage barriers. The objective was to create an all-encompassing and comprehensive representation of teachers' technology integration journeys.

Research Instrument

Semi-structured interviews served as the primary research instrument for data collection [11] [10] [12]. The interview protocol consisted of 16 main questions organized into four thematic areas:

ICT Training Experience (Questions 1-4), Understanding the nature, quality, and effectiveness of ICT training teachers have received

ICT Access and Usage Challenges (Questions 5-8), Identifying barriers teachers face when accessing and using ICT resources

Coping Strategies and Adaptations (Questions 9-12), Exploring how teachers creatively handle ICT limitations

Recommendations and Future Vision (Questions 13-16), Gathering actionable suggestions for improving ICT support

Each main question was accompanied by multiple probes designed to elicit deeper responses and clarifications. Open-ended questions enabled participants to freely express their experiences, emotions, and perceptions regarding ICT access and usage barriers. The interview protocol was designed to elicit responses that explore participants lived experiences and the factors influencing their technology integration journey. Using open-ended, semi-structured interviews as the primary data collection method aligns with phenomenological research principles [11] [10] [12]. This technique enables participants to express their experiences freely and provides the researcher with rich, detailed narratives to analyze. As participants share their ICT integration journeys, the researcher can capture the diverse feelings, challenges, and triumphs encountered while accessing and using technology in teaching.

Data Collection Procedure

To ensure accuracy and reliability in the research process, the study implemented various strategies recommended by Lincoln and Guba (1985) [11]. These strategies include:

- Prolonged engagement with participants to develop rapport and establish trust.
- Member checking to verify the accuracy of the findings.
- Peer debriefing to solicit feedback and enhance the study's credibility.
- Reflexivity maintained throughout the research process to recognize and manage any personal biases.

Data was collected through structured and audio-recorded interviews to capture teachers' rich and nuanced experiences with ICT access and usage barriers. The interviews were conducted in comfortable and private settings, allowing participants to freely express their thoughts, emotions, and perceptions about their technology integration journey. Each interview lasted

approximately 30-45 minutes. The open-ended nature of the interviews enabled participants to share their lived experiences comprehensively, reflecting on how their context, emotions, and technological access are interconnected. Participants were informed of their rights, including confidentiality, voluntary participation, and the ability to withdraw at any time without consequences.

Data Analysis

The interviews were transcribed verbatim to ensure accuracy and thoroughness in data analysis. The verbatim transcription provided a detailed and comprehensive representation of participants' responses, ensuring no valuable information was overlooked during the analysis phase. The transcriptions served as the primary data source, allowing the researcher to examine into the intricate details of participants' ICT access and usage experiences.

Data analysis involved a thematic approach, following the guidelines proposed by Braun and Clarke (2006) [18] [19] [20]. This six-phase process included:

1. Familiarizing with the data. The researcher carefully read and re-read the transcriptions to gain a holistic understanding of the participants' experiences
2. Generating initial codes. Meaningful units of information related to ICT access and usage experiences were identified and coded
3. Searching for themes. Initial codes were organized into potential themes, capturing the essence of participants' experiences
4. Reviewing themes. The identified themes were examined to ensure coherence and relevance to the research objectives
5. Defining and naming themes. Final themes were named and defined to represent the essence of participants lived experiences
6. Writing up. Comprehensive analysis and interpretation of the themes in relation to existing literature

The researcher identified recurring patterns and themes from the participants' narratives [18] [19] [20]. These themes were examined in-depth to uncover the essence of participants' ICT access and usage experiences and the factors influencing their technology integration journey. The thematic analysis process allowed for systematically examining the data, providing valuable insights into the complex and complex nature of teachers' experiences with ICT barriers. Throughout the research procedure, validation techniques were employed to enhance the credibility and dependability of the findings [11]. Prolonged engagement with participants fostered trust and rapport, ensuring they felt comfortable sharing their experiences openly. Member checking was conducted to validate the accuracy of the data, allowing participants to verify the researcher's interpretation of their experiences. Additionally, peer debriefing was employed to seek feedback from external researchers, providing an objective perspective on the research process and analysis. Following this comprehensive research procedure, the study aims to provide invaluable insights into the lived experiences of teachers regarding ICT access and usage barriers in Philippine schools. The methodological rigor and ethical considerations undertaken in this research contribute to the trustworthiness and significance of the study's findings.

Results and Discussion

The thematic analysis of interview data from seven teacher-participants revealed four overarching themes that capture the essence of teachers' lived experiences with ICT access and usage barriers: (1) Emotional Experiences and Challenges, (2) Holistic Learning Experience, (3) Psychophysiological Responses, and (4) Active Learning Strategies. These themes emerged through systematic coding and analysis of significant statements from participants' responses across all 16 interview questions.

Theme 1: Emotional Experiences and Challenges

Teachers described a complex mix of emotional reactions linked to their use of ICT in the teaching–learning process. These emotions—especially anxiety and frustration—greatly shaped their confidence, motivation, and continued effort to integrate digital tools in their instruction.

Anxiety and Insecurity

Many teachers reported feeling anxious, insecure, and doubtful of their own competence whenever they used technology in class. One teacher reflected: *“I often feel uneasy and unsure when using ICT because I’m afraid of making mistakes, especially when others seem more skilled. I sometimes doubt my own ability to keep up with the demands of digital teaching.”* This anxiety often stemmed from fear of being judged by colleagues or students, especially when using English-based software or applications where language barriers and pronunciation errors could draw attention.

Fear of Public Judgment and Frustration

Some participants recalled moments of embarrassment or public shaming that worsened their anxiety and discouraged ICT use. One shared: *“I once experienced being corrected harshly in public, and it made me question my ability to continue using ICT in class. It made me feel unworthy and demotivated.”* Such experiences created lasting stress, leading teachers to associate technology use with feelings of pressure and humiliation rather than growth and innovation. These emotional struggles illustrate that ICT integration is not only a technical challenge but also an emotional one. Anxiety, fear of mistakes, and frustration reduce teachers' willingness to experiment with new tools, limiting the potential of technology to support meaningful learning.

Frustration with Infrastructure

Teachers consistently expressed frustration when technology failed during lessons due to poor internet connectivity, equipment malfunctions, or power outages. *“Some students get stuck, bored and lose interest as their reaction when technology doesn't work. Many missed activities and skipped competencies that are learning opportunities lost.”* This frustration was compounded by the perception that they were letting their students down and unable to deliver the engaging, modern lessons they had planned.

Privilege and Pride

Despite the challenges, some teachers expressed feelings of privilege and pride in having access to any ICT resources at all. *“I feel privileged to be a teacher, yet I am out of context because there was no internet but despite that, I am still honoured to teach with or without the technology.”* This reflects the reality that many teachers come from backgrounds where

technology access was limited, making even basic resources feel like an advancement. These emotional experiences are consistent with research showing that affective factors play a crucial role in technology adoption [3] [15]. When teachers experience negative emotions such as anxiety, frustration, or shame in relation to ICT, they are more likely to avoid using technology or revert to traditional methods [13] [15]. Conversely, positive emotional experiences can enhance motivation and engagement with technology integration.

Theme 2: Holistic Learning Experience

This theme captures teachers' perspectives on the comprehensive nature of ICT integration, encompassing technical skills, pedagogical approaches, infrastructure challenges, and contextual factors.

Training Content and Approach

All seven participants reported attending government-mandated ICT training, most recently focusing on Microsoft 365 Productivity Tools in February 2025. Teachers described these trainings as covering "*both technical and pedagogical approaches*" and valued learning how to "*integrate technology into lesson planning to create more interactive and engaging activities for learners.*" However, participants consistently identified gaps in the training programs. "*The training requires adequate time for us to explore, practice and master different features in MS 365. For me, the training is effective because it introduced useful tools and features but ineffective due to the limited time to fully explore and apply what we learned.*" This highlights the tension between breadth and depth in professional development [7].

Infrastructure Inadequacy

The lack of basic ICT infrastructure emerged as a pervasive challenge. Six out of seven teachers reported that their schools lacked computer laboratories, with equipment ratios as high as "1 laptop to 15 learners." One teacher explained: "*We don't have computer laboratories; we have limited equipment where 1 laptop is to 15 learners in ratio for learning use. This could lead to a physical barrier as to the availability of the ICT tools for learning and its accessibility.*"

Internet Connectivity Issues

All seven participants identified poor internet connectivity as a major barrier to ICT usage. "*Internet connectivity in our school is very slow which makes it challenging to fully use online tools and other platforms.*" In rural areas, connectivity was described as "unreachable" or "unavailable due to weather conditions." This aligns with research showing that internet access remains one of the most significant barriers to educational technology integration in developing countries [3] [4] [13].

Outdated Equipment

Teachers reported that technological equipment in their schools was typically 5-10 years old. "*Our technology in our school estimated old of 5 to 10 years old from the old desktop and projectors. The laptop provided by the DepEd is old and slow. It is full or storage are limited and needs frequent formatting.*" This creates compatibility issues, slow processing speeds, and frequent malfunctions that disrupt lessons [13] [14].

Lack of Ongoing Support

Multiple participants mentioned the absence of sustained technical support and follow-up after initial training sessions. *"The challenges are lack of ongoing support, mentorship, lack of materials like laptop."* This gap between one-time training and continuous support limits teachers' ability to develop proficiency and troubleshoot problems independently [3] [15]. The holistic learning experience theme reveals that ICT integration is not merely a technical challenge but a complex interplay of training quality, infrastructure availability, technical support, and contextual factors [15] [16]. Teachers' ability to effectively use technology depends on the alignment of all these elements within their school environment.

Theme 3: Psychophysiological Responses

This theme captures teachers' physical and psychological reactions to ICT challenges, as well as the impact on their overall well-being and teaching practice.

Stress and Pressure

Teachers described experiencing significant stress when technology failed during lessons or when they felt unprepared to use ICT tools. *"I also feel pressured din kasi as an English major, people are expecting me to be fluent in speaking."* This pressure was compounded by expectations from administrators, colleagues, and students that teachers should be technologically proficient.

Adaptation Stress

The constant need to adapt to changing technologies and troubleshoot problems created ongoing stress. *"Sometimes I've faced unstable internet and subject-specific software. The training covered many tools in a short span, leaving little time to fully explore advanced features or practice independently."* This reflects the cognitive load associated with learning new systems while simultaneously managing teaching responsibilities [8] [7].

Physical Manifestations

Some teachers mentioned physical responses to technology-related stress, including fatigue and burnout. *"I felt like I was demotivated... I felt like I'm always tired whenever the time for that training or ICT workshop came and I believe that emotion and not willing affects my learning."* The combination of inadequate resources, limited training, and high expectations created a psychologically taxing environment.

Environmental Factors

Teachers noted how physical environmental conditions affected their ability and willingness to use ICT. *"The physical experience... environment if it is conducive enough for our students to learn. Like for example now na nag-online tayo bigla kasi hindi conducive masyado yung ating classrooms para kasi sobrang init."* This highlights how infrastructure limitations extend beyond just technological equipment to include basic facilities like electricity, ventilation, and space [13] [14].

Resilience and Recovery

Despite these challenges, teachers demonstrated psychological resilience. *"So, I think I had 3 weeks before I was able to recover from that feeling because it was the first time that I was being shamed publicly for that technology malfunctioned."* This capacity for recovery and

continued engagement with ICT, despite negative experiences, reflects teachers' commitment to their professional development and student learning. The psychophysiological response's theme underscores that ICT integration challenges are not merely logistical or technical issues—they have real impacts on teachers' mental and physical well-being [9]. When teachers experience chronic stress, frustration, and inadequate support, it affects their capacity to innovate and persist with technology integration [15].

Theme 4: Active Learning Strategies

Despite facing significant barriers, teachers demonstrated remarkable creativity, resourcefulness, and agency in developing strategies to cope with ICT limitations. This theme highlights teachers' active role as problem-solvers rather than passive recipients of policy directives.

Traditional Methods as Backup

All seven teachers reported having backup plans using traditional teaching methods when technology failed. *"My backup plan when technology fails during my lesson are the books, modules, ADM and other printed supplementary materials."* This demonstrates adaptive planning and the ability to maintain instructional continuity regardless of technological availability [15].

Personal Resource Investment

Five out of seven teachers reported using their own devices and personal mobile data to supplement limited school resources. *"Yes, I have used my own devices and resources. I've implemented creative solutions such as my personal devices and mobile data when the school internet is down."* This personal investment reflects teachers' commitment to providing quality education but also raises equity concerns about who bears the financial burden of ICT integration [4] [7].

Offline and Downloaded Materials

Teachers developed strategies to minimize dependence on unreliable internet connectivity by downloading materials in advance. *"I always have a low-tech back-up that before I teach, I use a tech-free lesson plan, store the materials usually in the USB and or the hard drive. Offline lesson kits, dual mode lessons that both online and offline."* This proactive approach demonstrates forward planning and risk mitigation.

Peer Learning and Collaboration

All seven participants emphasized the importance of collaborative support networks among colleagues. *"There is formal or informal tech support from my colleagues because we support and work together towards a common goal... Yes, teachers often help each other with technology issues sharing tips and sharing best practices."* These informal learning communities provided critical knowledge sharing and emotional support [15] [16].

Creative Pedagogical Adaptations

Teachers found innovative ways to maximize limited resources. *"I borrowed personal laptops from my colleagues. I divided the class into groups, learners who grasped the tools quickly were assigned in different groups as tech buddies to solve this situation."* This peer-assisted

learning approach not only addressed equipment shortages but also promoted collaborative learning among students.

Free Online Tools

Six teachers reported utilizing free online applications and platforms to compensate for lack of licensed software. *"Yes, we have use free online tools and application provided by the organization, DepEd, such as free Canva, Adobe and other Microsoft 365 tools and product."* This demonstrates resourcefulness in identifying accessible alternatives.

Continuous Self-Directed Learning

Teachers actively sought opportunities to enhance their ICT skills beyond formal training. *"Yes, I always communicate to our District and Division ICT personnel, I consult our school heads and at the same time I enrolled myself to a lot of online training from the DepEd, International trainings on Microsoft and also on the Google applications which is true helpful in my designation."* This initiative reflects professional commitment and a growth mindset [15]. The active learning strategy's theme reveals that teachers are not passive victims of ICT barriers but rather active agents who develop creative solutions to persist in technology integration despite significant obstacles [15] [16]. This resilience and resourcefulness should be recognized and supported through systemic interventions that reduce the burden on individual teachers.

Cross-Cutting Findings

Several important patterns emerged across all four themes:

The Critical Role of Training Quality. While all teachers attended mandatory ICT training, the effectiveness varied significantly based on factors such as duration, hands-on practice opportunities, relevance to actual classroom needs, and follow-up support. Teachers rated training effectiveness between 7-10 out of 10 but consistently requested more time for practice and deeper exploration of tools.

Infrastructure as a Fundamental Barrier. Regardless of teachers' motivation, skills, or creativity, the lack of basic infrastructure—reliable internet, sufficient devices, functional equipment—created insurmountable barriers to consistent ICT integration. This aligns with research showing that facilitating conditions are among the most critical factors in technology adoption [15] [16].

The Digital Divide Mirrors Socioeconomic Inequality. Teachers' experiences reflected broader patterns of inequality in Philippine society. Rural schools, schools in low-income areas, and schools with less political influence consistently had worse ICT access than urban, well-funded schools [4] [5] [6]. This perpetuates educational inequality and limits opportunities for students in already disadvantaged communities.

Teacher Agency and Innovation. Despite systemic barriers, teachers demonstrated remarkable agency in finding workarounds, investing personal resources, building support networks, and continuing to pursue ICT integration. This resilience deserves recognition and should inform policy approaches that empower rather than burden teachers.

The Need for Holistic Support Systems. Effective ICT integration requires more than just equipment and one-time training. Teachers need ongoing professional development, technical

support, collaborative learning communities, administrative encouragement, adequate time for planning and experimentation, and recognition of their efforts [15] [16].

Conclusions

This phenomenological study provides deep insights into the lived experiences of teachers regarding ICT access and usage barriers in Philippine schools. The findings explain the complex nature of technology integration challenges in education and reveal both the obstacles' teachers face and the remarkable resilience and creativity they demonstrate in response.

Key Findings

The study identified four overarching themes that characterize teachers' ICT experiences:

First, teachers experience a wide range of emotional responses to ICT integration, from anxiety and frustration when technology fails to pride and motivation when it succeeds. These affective dimensions significantly influence teachers' willingness and persistence in using technology. Negative experiences such as public shaming or repeated technical failures create psychological barriers that extend beyond the immediate incident.

Second, the holistic learning experience encompasses not just technical skills but also pedagogical approaches, infrastructure adequacy, administrative support, and contextual factors. Teachers recognize the value of ICT for enhancing student engagement and learning outcomes, but their ability to realize this potential is constrained by systemic barriers including poor internet connectivity, lack of computer laboratories, insufficient devices (with ratios as high as 1:15), and outdated equipment.

Third, psychophysiological responses to ICT challenges manifest as stress, pressure, fatigue, and adaptation strain. Teachers bear significant cognitive and emotional loads as they navigate technological limitations while trying to meet expectations for modern, engaging instruction. The physical environment—including issues like extreme heat, unreliable electricity, and inadequate facilities—compounds these challenges.

Fourth, despite facing substantial barriers, teachers demonstrate active learning strategies and remarkable agency. They develop backup plans using traditional methods, invest personal resources (devices and mobile data), download materials for offline use, build collaborative support networks, employ creative pedagogical adaptations, utilize free online tools, and engage in continuous self-directed learning. This resilience reflects deep professional commitment but also highlights the inequity of expecting individual teachers to compensate for systemic deficiencies.

Theoretical Implications

The findings align with and extend existing theoretical frameworks for understanding technology adoption in education. The study confirms that barriers to ICT integration operate at multiple levels—individual (teacher knowledge, skills, beliefs), organizational (school infrastructure, support systems, culture), and systemic (policy, funding, regional disparities) [15] [16].

The phenomenological approach revealed dimensions of teachers' experiences that quantitative studies often miss, particularly the emotional and psychological impacts of ICT barriers [9] [10] [12]. Understanding these lived experiences is crucial for developing interventions that

address not just technical capacity but also the affective and contextual factors that shape technology use. The study also demonstrates that teachers are not merely implementers of policy but active agents who interpret, adapt, and creatively respond to technological constraints [15] [16]. This agency should be recognized and leveraged in policy design, moving away from top-down mandates toward collaborative approaches that empower teachers' innovation.

Practical Implications

The findings have several important practical implications for improving ICT access and usage in Philippine schools:

Infrastructure Investment. Addressing the fundamental infrastructure deficits—reliable high-speed internet, adequate and up-to-date devices, functional equipment, computer laboratories—must be the top priority. No amount of teacher training or motivation can compensate for the absence of basic technological resources [3] [6] [13].

Enhanced Professional Development. ICT training programs should be redesigned to provide adequate time for hands-on practice, focus on pedagogical integration rather than just technical skills, include subject-specific applications, offer ongoing support and mentorship beyond one-time workshops, and address troubleshooting and problem-solving skills [7] [15].

Technical Support Systems. Schools need dedicated ICT coordinators or technicians who can provide immediate assistance with technical problems, maintain and update equipment, and serve as ongoing resources for teachers [13] [15].

Collaborative Learning Communities. The informal peer support networks that teachers have organically created should be formalized and supported through structured learning communities, platforms for sharing best practices, and time allocated for collaborative planning [16].

Equitable Resource Distribution. Policymakers must address the digital divide by prioritizing resource allocation to rural, remote, and underserved schools that currently have the least access to ICT infrastructure [4] [5] [6].

Teacher Well-being. Recognition of the psychological and emotional toll of technology integration challenges should inform supportive policies that reduce pressure, provide recognition for teachers' innovations, and create safe spaces for experimentation without fear of judgment.

Recommendations

Based on the study's findings, the following recommendations are proposed for different stakeholders:

For School Administrators

School administrators should regularly conduct ICT needs assessments to pinpoint gaps in resources, infrastructure, and teacher competencies. It is critical to set up dedicated ICT support teams or coordinators, allocate sufficient budget for equipment and connectivity, and ensure ongoing maintenance. Administrators must also provide teachers with opportunities and protected time for collaboration, experimentation with technology, and professional sharing,

all without adding to their workload. Fostering an environment that encourages innovation, views technical setbacks as learning opportunities, and celebrates teachers' attempts at ICT integration is essential. Finally, equity should be at the center of ICT planning, guaranteeing equal access for all teachers and students regardless of grade or subject.

For Policymakers and DepEd Officials

Policymakers and DepEd officials must develop a holistic digital transformation plan that simultaneously tackles infrastructure, capacity building, support, and equity across the education system. Increased and sustained funding must especially target rural and underserved schools to bridge the digital divide. Efforts should expand internet connectivity to all learning spaces, treating it as basic infrastructure. Collaboration with telecom companies, tech providers, and local government will leverage more resources. Professional development in ICT integration should be regular, practical, and adequately supported, with teachers included in policy design and feedback processes. ICT policies need to be flexible to fit diverse contexts, and incentive schemes should reward creative and resilient teachers. Ongoing monitoring and evaluation are essential for identifying school needs and measuring progress.

For Teacher Training Institutions

Teacher training institutions should redesign pre-service curricula to embed ICT literacy and technology integration throughout teacher preparation, not limiting it to isolated subjects. Training must be hands-on and focused on classroom application, giving future teachers real experiences using technology in learning. Effective technology integration should be modelled in every course, alongside practical instruction in troubleshooting and low-tech backup strategies. Certification programs and micro-credentials should be offered to encourage ongoing professional development in educational technology.

For Teachers

Teachers should actively build collaborative networks to exchange resources, strategies, and emotional support in overcoming ICT challenges. Advocating for resources by documenting and communicating ICT needs is crucial. Embracing a growth mindset helps teachers see technology hurdles as opportunities for growth, not barriers. Flexible lesson planning with backup strategies prepares for unexpected tech failures, while ongoing self-learning through online tutorials builds confidence. Teachers should focus on student learning rather than perfect tech use, use technology to support pedagogy, and practice self-care to avoid burnout from the extra demands ICT may bring.

For Future Research

Future research should include longitudinal studies examining teachers' ICT competencies and emotional experiences over time and employ mixed methods to explore both qualitative and quantitative aspects of ICT use and student outcomes. Researchers should investigate student perspectives on ICT access, analyse successful models of overcoming technology barriers, and assess cost-effectiveness of various ICT solutions for smart allocation. Alternative access approaches like BYOD and community centres merit exploration, as does leadership's role in tech culture. Deeper analysis of equity should clarify how ICT barriers uniquely impact marginalized teachers and students.

Executive Note

The findings of this study shine a critical light on the multifaceted nature of the digital divide in Philippine education, foregrounding the voices and lived experiences of teachers as central to understanding both the obstacles and opportunities surrounding ICT integration. Teachers revealed that the divide is not limited to tangible issues of device and internet access but deeply intertwined with the quality of training, consistency of technical support, organizational culture, and emotional factors such as anxiety, frustration, and vulnerability. Persistent systemic inequities further complicate the process, with marginalized communities and rural schools facing particularly acute disadvantages. Despite these challenges, teachers have shown remarkable ingenuity, resilience, and collegiality. Informal collaborations, peer mentoring, and creative adaptation strategies help educators persist in integrating technology for learning even in resource-constrained settings. However, this individual resilience should never be regarded as a substitute for systemic responsibility, as it risks overlooking the urgent need for more comprehensive institutional and policy-level support.

Addressing the digital divide in Philippine education requires a holistic, multi-level approach encompassing infrastructural upgrades, robust teacher training, ongoing technical support, and policies that champion equity and inclusion. It is imperative that teachers are authentically included in educational decision-making, their insights recognized, and their professional needs consistently addressed through sustained investments in both technology and human resources. The COVID-19 pandemic exposed the critical role of ICT in ensuring educational continuity and revealed the persistent gaps in infrastructure and preparedness across schools. As the education system transitions into the post-pandemic era, there is both a challenge and an opportunity to reconstruct a more equitable and resilient ICT ecosystem, one that learns from teachers' experiences and harnesses their drive for innovation. The hope expressed by teachers—that all educators are empowered, skilled, and supported, and that learners gain true digital literacy—serves as a guiding beacon for all stakeholders working toward a more inclusive and technologically adept educational future.

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