

Experiences and Challenges in the Implementation of Inclusive Education Through Technology: A Case Study Of Pratum School In Phasi Charoen District, Bangkok, Thailand

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ABSTRACT

This qualitative study examined the experiences and challenges in implementing technology-assisted inclusive education among educators in selected Pratum Schools in Phasi Charoen District, Bangkok, Thailand. Using a qualitative case study approach, data were collected through interviews with 13 educators who had varying levels of teaching experience, subject specializations, and technological preparedness. Findings revealed that the majority of participants were novice teachers (53.8%, n=7), followed by mid-career educators (38.5%, n=5) and veteran teachers (7.7%, n=1), indicating a predominantly early-career workforce. In terms of subject specialization, 53.8% (n=7) taught English language courses, while 23.1% (n=3) specialized in Mathematics and Science and another 23.1% (n=3) served as multi-subject educators. Analysis of technological preparedness revealed that 46.1% (n=6) had formal technology training, 38.5% (n=5) had no formal training, and 15.4% (n=2) relied on informal or peer-mediated learning, highlighting disparities in digital readiness. Major challenges included unstable power supply, internet disruptions, outdated devices, language barriers in digital interfaces, classroom space limitations, and inadequate technical support. Socio-economic inequities also created “Digital Spectatorship,” wherein students without access to personal devices became passive observers rather than active participants in learning activities. Educators’ perceptions reflected a dominant theme of “Pragmatic Frustration,” demonstrating a strong belief in technology as an inclusive educational bridge while simultaneously experiencing difficulties due to insufficient institutional support. Despite these constraints, teachers demonstrated instructional resilience through practices such as personal resource subsidy, mediated facilitation, peer-assisted learning, and grouped-access strategies. Furthermore, technologies such as YouTube, Canva, Kahoot, Baamboozle, LINE, and Smart TVs emerged as preferred instructional tools due to their accessibility and adaptability. The study concludes that teachers function as the primary “Human Bridge” sustaining technology-assisted inclusion in under-resourced educational settings.

Keywords: Technology-assisted inclusive education, digital inclusion, teacher experiences, socio-economic inequity, instructional resilience

INTRODUCTION

Since UNESCO adopted the Salamanca Statement and Framework for Action in 1994, the movement towards inclusive education has accelerated. Contemporary perspectives emphasize that inclusive education is crucial to ensuring that all students, regardless of their individual differences or learning needs, are welcomed, valued, and afforded equal educational opportunities (UNESCO, 2017; Forlin, 2018; Schuelka & Johnstone, 2020). In today's evolving educational landscape, modern technology offers promising solutions to address the challenges of inclusive education. This research paper aimed to explore how modern technology was used

to enhance inclusive education practices in elementary schools in Bangkok, Thailand, focusing on the challenges encountered and the innovative practices employed to improve the quality and inclusivity of education for all students.

While Thailand has made efforts to promote inclusive education—such as ratifying the UN Convention on the Rights of Persons with Disabilities (CRPD) and implementing national policies—longstanding cultural attitudes continue to present significant challenges. The Thai cultural landscape, shaped by values of conformity, social hierarchy, and community harmony, historically limited support for the integration of children with disabilities into mainstream classrooms (Phaswana, 2020; Chareonsri & Soranastaporn, 2022). In many parts of Thai society, disabilities are still viewed with stigma and misunderstanding. Cultural beliefs associating disability with karma or misfortune from past lives persist, especially in rural and traditional communities. These views often lead to social exclusion, feelings of shame, and silence within families (Grimes et al., 2021). As a result, disability is often considered a private matter, and children with special needs are often hidden or isolated rather than included in public education settings (Tantixalerm & Amornpaisarnloet, 2021).

According to Zwarych (2023), assistive technology enables individuals with specific needs to accomplish tasks they might otherwise struggle with. In today's diverse settings, assistive technology plays a crucial role in creating an inclusive environment. Removing barriers ensures that students with different abilities can actively engage and succeed alongside their peers. Zwarych (2023) noted that its implementation offers several instructional design benefits, including enhanced accessibility, personalized learning, improved communication, and the promotion of independence.

Overall, this study underscored the critical role of inclusive education in fostering equitable learning environments and highlighted the transformative impact of modern technology and assistive tools in achieving this goal. While significant progress had been made in integrating technological advancements, a crucial methodological research gap persisted: the scarcity of studies employing qualitative methods in this domain. Most existing research has relied on quantitative metrics to assess the efficacy of technological interventions, often focusing on measurable outcomes such as academic performance. However, these metrics alone failed to capture the nuanced experiences and contextual factors that influenced the effectiveness of these practices. Qualitative research methodologies, such as the interviews and case studies conducted in this study, were essential for providing deeper insights into the lived experiences of students, educators, and stakeholders within inclusive educational settings. These approaches allowed for a richer exploration of how technological tools were perceived, implemented, and adapted in real-world contexts, offering a comprehensive understanding of the challenges and successes encountered.

Statement of the Problem

The purpose of the study was to examine the perceptions, knowledge, attitudes, practices, and challenges faced by faculty members of five selected pratum schools in Phasi Charoen District, Bangkok, Thailand, in addressing inclusive education using modern technology.

Specifically, the research answered the following questions:

1. What is the demographic profile of the teacher-respondents involved in the study in terms of age, years of teaching experience, educational background, and training in technology or inclusive education in ten selected Pratum Schools across Phasi Charoen

District in Bangkok, Thailand?

2. What are the major educational challenges in relation to technology-enabled learning to assist, cater, or pave the way to inclusive education in ten selected Pratum Schools across Phasi Charoen District in Bangkok, Thailand?

3. What are the attitudes and perceptions of educators towards the integration of modern technology in inclusive education in the ten selected Pratum Schools across Phasi Charoen District in Bangkok, Thailand?

4. What are the major educational practices and challenges employed and faced by educators in relation to technology-enabled learning to assist, cater, or pave the way to inclusive education in the ten selected Pratum Schools across Phasi Charoen District in Bangkok, Thailand?

5. What are the specific “modern technologies” used by educators to assist, cater, or pave the way to inclusive education in the ten selected Pratum Schools across Phasi Charoen District in Bangkok, Thailand?

Scope and Delimitations

This research paper focused exclusively on ten selected elementary (pratum) schools in the Phasi Charoen district of Bangkok, Thailand, within the scope of the Academic Year 2025-2026. The study delved into inclusive education practices and the use of modern technology in these 10 schools across the district. This paper did not assess the financial aspects and budget allocation for integrating modern technology into inclusive education practices in Thai elementary schools, nor did the study focus on the evaluation of individual technological tools or brands, but instead assessed the overall challenges and practices employing modern technology integration in inclusive education. The research paper also focused exclusively on public elementary or "pratum" schools in Thailand, excluding private schools from the study due to potential differences in resources, policies, and practices. Lastly, this research concentrated on identifying the challenges faced and practices employed in integrating modern technology into inclusive education, rather than assessing the outcomes or long-term effects on student performance.

Review of Related Literatures

This review of related literature and studies discusses the use of modern technology in inclusive education. It focuses on four areas: inclusive education concepts, the role of technology in learning, challenges in Thailand, and policies supporting inclusive practices. It also highlights gaps in infrastructure and teacher training that this study aims to address.

Defining Inclusive Education

Inclusive education is a comprehensive pedagogical philosophy and practice that addresses the diverse needs of all learners by increasing participation in learning, cultures, and communities and reducing exclusion. It is grounded in the belief that every child has the right to quality education in a regular classroom setting, regardless of physical, cognitive, socio-emotional, economic, linguistic, or cultural differences (UNESCO, 2020).

Importantly, inclusive education shifts the traditional perspective that learners must adapt to the educational system. Instead, it places responsibility on the school system to adapt to the learner. It challenges educators and institutions to remove barriers—whether physical, attitudinal, or instructional—that may hinder a student’s access to learning. As such, inclusive education is not solely about students with disabilities but encompasses all forms of marginalization and disadvantage, such as language barriers, gender inequality, poverty, or trauma.

Inclusive education is not only a rights-based approach, as promoted by frameworks such as the UN Convention on the Rights of Persons with Disabilities, but is also supported by evidence showing that inclusive environments benefit all students—promoting empathy, collaboration, social cohesion, and improved academic outcomes.

Global Perspectives on Inclusive Education

The implementation of inclusive education continues to differ widely across countries, shaped by a range of socioeconomic, cultural, and political factors. In high-income countries such as Finland, Canada, and Sweden, inclusive education is often well-integrated into national education policies and teacher training, reflecting a strong rights-based approach and systemic investment (Schuelka, 2018; Florian & Beaton, 2018). These nations developed mechanisms to accommodate diverse learners in mainstream settings, including differentiated instruction, inclusive assessments, and supportive learning environments.

The current discourse on inclusive education increasingly recognizes that inclusion is not solely about disability but encompasses gender, language, ethnicity, poverty, and migration status—all of which can act as barriers to learning (UNESCO, 2020). As such, inclusive education is now widely regarded as a transformative approach that requires redesigning curricula, teaching methods, assessment strategies, and school environments to ensure that no learner is left behind (Magnússon, 2019; Opertti et al., 2018).

The Role of Technology in Inclusive Education

The integration of modern technology into educational systems has profoundly reshaped how inclusivity is understood and practiced in schools. Inclusive education, by definition, emphasizes the right of all students—regardless of physical, intellectual, social, emotional, linguistic, or other conditions—to participate fully in learning alongside their peers in a shared educational setting. However, despite global efforts to promote inclusive education, various systemic, institutional, and classroom-level barriers continue to prevent its effective implementation. These barriers include limited teacher preparedness, insufficient resources, rigid curricula, and physical or communicative challenges faced by learners with disabilities. In this context, current literature increasingly highlights the critical role of modern technology in addressing these persistent obstacles and fostering a learning environment that is responsive, equitable, and inclusive (Herodotou et al., 2018; Radianti et al., 2020; Zwarych, 2023).

One of the most prominent benefits of modern educational technology is its ability to facilitate personalized learning pathways. According to Khosravi et al. (2020), adaptive learning systems and data-driven educational platforms allow teachers to tailor instructional materials to individual student profiles. These technologies analyze learners' progress in real time, identifying strengths and weaknesses and suggesting specific interventions that match each student's learning pace, style, and needs. Such personalization is particularly beneficial in inclusive classrooms, where students may display a wide spectrum of abilities and learning differences. Personalized digital tools support differentiated instruction by enabling students to access content in various formats—visual, auditory, kinesthetic, and text-based—ensuring that no student is left behind due to a mismatch between teaching style and learning preference.

The literature also emphasizes that inclusivity through technology is not solely a matter of access to hardware or software, but also about how these tools are meaningfully integrated into pedagogy. Herodotou et al. (2018) argue that the effectiveness of educational technology depends on thoughtful instructional design and teacher training. Teachers must be equipped with

the competencies to use digital tools not just as add-ons but as integral components of lesson planning, assessment, and classroom interaction. For instance, interactive whiteboards and gamified learning apps can engage students with attention difficulties, while virtual simulations and digital storytelling tools can help visual learners grasp abstract concepts. When integrated effectively, these technologies promote Universal Design for Learning principles—providing multiple means of representation, expression, and engagement—which are fundamental to inclusive education.

Moreover, modern technologies encourage collaborative and participatory learning, supporting the social inclusion of students who might otherwise be isolated due to their differences. Digital platforms facilitate group projects, peer feedback, and real-time communication, nurturing a sense of belonging and mutual respect. For example, students working on shared documents or digital storytelling projects can contribute in different ways—writing, illustrating, researching, or narrating—based on their strengths and preferences. This allows all students, including those with disabilities, to feel that their contributions are valuable, reinforcing their confidence and self-efficacy.

In the Thai context, where inclusive education policies are being gradually implemented in public Pratum (elementary) schools, the role of technology is particularly significant. Many schools in Thailand, especially in urban districts like Phasi Charoen, face challenges related to overcrowded classrooms, a shortage of special education teachers, and limited physical infrastructure for learners with disabilities. In such settings, the thoughtful use of technology can serve as a bridge toward more equitable educational opportunities. Government-supported programs such as the "Smart Classroom" initiative and NGO-led technology donation drives aim to narrow the digital divide and empower educators to integrate assistive and instructional technologies into their teaching practices. However, these efforts must be accompanied by continuous professional development and policy support to ensure that technologies are used not only for innovation's sake but for the genuine advancement of inclusive pedagogies.

Challenges in Integrating Technology for Inclusion in Thai Primary Schools

Despite the promising potential of modern technology in enhancing inclusive education, its practical integration into primary school settings in Thailand faces numerous obstacles and has not yet achieved the level of attention and investment required for substantial impact. Inclusive education, which aims to ensure that all learners—regardless of ability, background, or circumstance—receive equitable learning opportunities within mainstream classrooms, is increasingly recognized in Thai education policy. However, the deployment of technology to support such inclusive practices remains sporadic and underdeveloped in the majority of Thai primary schools. This gap between policy aspirations and actual implementation continues to hinder progress toward a truly inclusive and technologically empowered educational system.

International and National Policy Support for Inclusion

Inclusive education has gained considerable momentum on the global stage over the past two decades, driven by an increasing recognition of the fundamental rights of all individuals to access equitable and quality education. International policy instruments have played a pivotal role in shaping the discourse around inclusion, placing pressure on national governments to align their educational systems with universal principles of equity, non-discrimination, and accessibility. One of the most influential frameworks in this regard is the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), adopted in 2006, which explicitly affirms the right of persons with disabilities to inclusive, quality, and free education at all levels. Article 24

of the UNCRPD calls upon signatory states to ensure that persons with disabilities are not excluded from the general education system on the basis of disability and to provide reasonable accommodations and individualized support measures in environments that maximize academic and social development (UNCRPD, 2006).

The global commitment to inclusion is further reinforced by the Sustainable Development Goals (SDGs), particularly Goal 4, which advocates for “inclusive and equitable quality education and lifelong learning opportunities for all” by the year 2030 (UNESCO, 2016). This goal highlights the need to eliminate disparities in education access and outcomes, especially for marginalized populations, including children with disabilities, indigenous communities, and those from economically disadvantaged backgrounds. The inclusion agenda under SDG 4 promotes not only physical access to schooling but also the development of inclusive pedagogical practices, learner-centered curricula, and the integration of assistive and digital technologies to support diverse learning needs. These global frameworks serve as guiding principles that inform national policy development and educational reform efforts around the world, including in Thailand.

Barriers to Implementation in Bangkok’s Pratum Schools

Although Thailand has established a comprehensive legal framework supporting inclusive education (ONEC, 2019), the practical implementation of these policies continues to encounter several obstacles, particularly in Pratum (primary) schools. These foundational educational institutions serve as critical environments where young learners begin to develop essential academic and social skills. In theory, the strong policy backing provided by national legislation should ensure that inclusive education is seamlessly integrated into everyday classroom practices. However, in practice, this integration remains inconsistent and unevenly distributed across the country. This challenge is especially evident in densely populated urban districts such as Phasi Charoen in Bangkok, where public schools are often overburdened with high student-to-teacher ratios and limited classroom space (Hongngam, 2021).

Major Educational Challenges in Technology-Enabled Inclusive Learning

Numerous research efforts have revolutionized the educational technology landscape for students with special needs, enabling unprecedented levels of accessibility and inclusivity. The researcher delved into some of the most relevant, related studies and literature about inclusive education, modern technology, and the overlapping roles of one and the other to cater to learners of all levels, coming from all walks of life, and those with different academic needs.

A primary obstacle is the digital divide—the gap in access to digital tools and internet infrastructure. A study by the UN Country Team in Thailand (2021) highlighted substantial disparities in digital access across different regions, with many schools lacking adequate internet connectivity and digital devices. This divide disproportionately affects students in underfunded municipal schools, limiting their opportunities for digital learning.

Another critical issue is the lack of adequate training for teachers in utilizing assistive and educational technologies. Research indicates that many educators are unfamiliar with the range of available assistive tools and how to integrate them effectively into their teaching practices (UNESCO, n.d.). This knowledge gap hinders the full support of students with diverse learning needs.

Incorporating technology into inclusive classrooms involves various strategies, including:

Providing assistive technology tools and devices to aid students with disabilities in accessing and engaging in educational activities. Utilizing educational software and applications that offer customized learning experiences to meet the diverse needs of students. Introducing online platforms and virtual learning environments to facilitate remote learning, ensuring educational access for all, especially those from marginalized backgrounds. Employing multimedia resources like videos and interactive presentations to foster engagement and comprehension among students. These approaches seek to establish inclusive learning environments where technology serves as a tool to bolster and enrich the educational journey of every student, irrespective of their individual characteristics (Uygur et al., 2020).

Teacher training programs are crucial for preparing educators to embrace inclusive education practices. These programs focus on teaching inclusive education principles, fostering inclusive learning environments, and addressing diverse student needs. Educators provide insights into students' needs, while parents offer insight into their children's abilities. Policymakers play a key role in crafting supportive policies for technology integration. Collaboration between educators, policymakers, and technology developers leads to tailored, inclusive educational technologies. This partnership involves regular communication, idea-sharing, and decision-making to ensure effectiveness and accessibility. Together, stakeholders establish a comprehensive approach to technology integration in inclusive classrooms, enhancing the learning experience for all students. (Uygur et al., 2020)

Educators' Attitudes and Perceptions Toward Technology in Inclusive Education

Educator attitudes play a pivotal role in the successful integration of technology in inclusive settings. Recent studies involving Thai educators have identified recurring themes, including inconsistent instructional practices, significant knowledge gaps, and systemic challenges in implementing inclusive education (Klibthong & Agbenyega, 2020). Similarly, research on teachers' professional readiness revealed that persistent barriers in pedagogical knowledge directly affect the adoption and effective use of inclusive practices (Pruet et al., 2016). These findings underscore the need for comprehensive professional development programs to enhance teacher preparedness and confidence in utilizing technology to support diverse learners. However, significant differences emerged in the specific classroom practices employed by high- and low-self-efficacy teachers to include all students. High self-efficacy teachers used fundamentally different strategies from their low self-efficacy counterparts. This study offers valuable insights into the limited empirical evidence exploring the relationship between teacher self-efficacy and inclusive practices (see Savolainen et al., 2020). The findings suggest that teacher self-efficacy may influence how teachers apply their philosophical understanding of inclusion in practice. While the study does not establish a causal relationship between self-efficacy beliefs and the use of inclusive practices, it clearly demonstrates an association between them.

Educational Practices Employing Technology for Inclusive Learning

Effective inclusive education in Thailand's Pratum schools increasingly depends on a blend of pedagogical strategies and technological innovations tailored to diverse student needs. The Thai Ministerial Regulations for the Provision of Assistive Technology, Media, and Services for People with Disabilities define assistive technology as tools that enhance the participation and potential of students with disabilities. These include both specialized tools—such as screen readers, text-to-speech software, and communication boards—and adaptable mainstream technologies like tablets, learning apps, and interactive whiteboards (Phochai et al., 2024). In theory, these tools are expected to be integrated into classroom routines to help students with

cognitive, sensory, or physical challenges access and engage with the curriculum more effectively. However, in actual school settings, especially within municipal and under-resourced Pratum schools, implementation is inconsistent and often ad hoc.

Specific Modern Technologies Used in Inclusive Classrooms

In the context of Thai Pratum (primary) schools, a growing number of modern technologies are being introduced to support inclusive education, though implementation remains uneven. These technologies can be broadly classified into three categories: assistive devices, digital learning platforms, and adaptive communication tools, all of which aim to reduce learning barriers for students with disabilities and diverse needs.

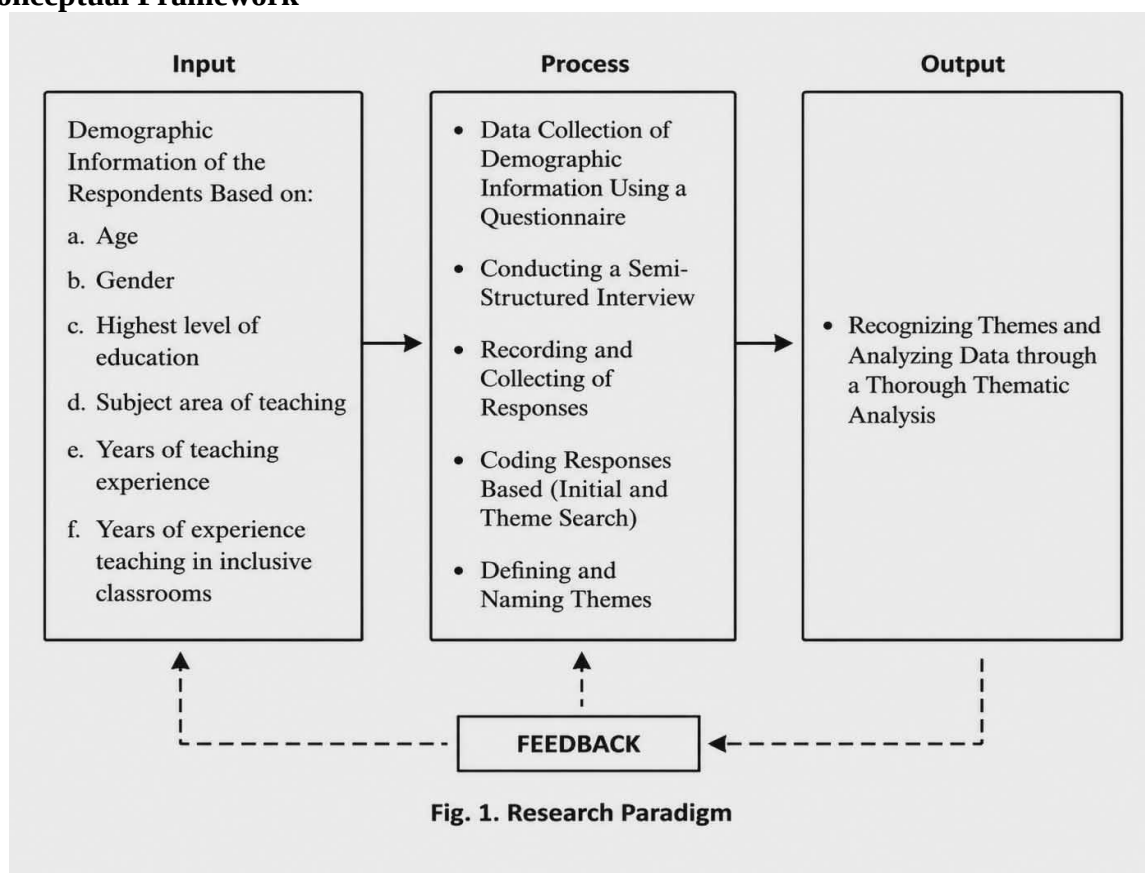
Assistive technologies such as screen readers, Braille displays, text-to-speech software, and speech-to-text applications have been introduced in select inclusive classrooms to aid students with visual, auditory, or motor impairments. According to Hongngam (2021), these tools not only facilitate access to learning materials but also empower students to participate more actively in classroom discussions and assessments. Some Thai schools have also piloted the use of touch-screen tablets loaded with learning applications in Thai language, math, and social skills, which are especially helpful for students with autism spectrum disorder or ADHD who benefit from. Ultimately, while specific modern technologies offer promising avenues for inclusive education in Thailand, their effectiveness depends on a holistic approach that includes appropriate teacher support, culturally and linguistically relevant software, and strong policy enforcement.

Theoretical Framework

This study adopted a qualitative case study research design to explore the integration of modern technology in inclusive education within selected Pratum schools in the Phasi Charoen District of Bangkok, Thailand. A qualitative design was most appropriate given the study's aim to understand educators' lived experiences, perspectives, and practices within their natural educational settings (Creswell & Poth, 2018). Through in-depth inquiry, the study sought to uncover nuanced insights into the attitudes, perceptions, challenges, and strategies employed by Pratum teachers in implementing inclusive, technology-supported learning environments.

According to Creswell & Poth (2018), qualitative research is an approach that looks at the lived experiences, behavior, and social phenomena within their context. Unlike quantitative research that focuses on figures and statistics, qualitative research prioritizes prose, imagery, and interpretative information in an effort to understand complex issues (Merriam & Tisdell, 2016). It is well known that this method is applied in social science, education, and health research in relation to human interactions, perceptions, and meanings in real life contexts (Yin, 2018). With this in mind, it was apparent that the researcher opted for a case study qualitative-based research design to allow the researcher to dig into a deep exploration of the educators' experiences based on their own accounts. This approach emphasized understanding human interactions and their underlying meanings within real-world settings. Data were collected through in-depth interviews, allowing for a nuanced exploration of educators' perspectives.

Conceptual Framework



This study adopted the Input–Process–Output (IPO) model as its conceptual framework to systematically explore how technology either facilitates or hinders inclusive education. The IPO model provided a coherent structure for understanding the relationships between teacher backgrounds, technological engagement, and inclusive teaching practices, as supported by Jha (2020). By following this model, the research can trace how specific inputs are transformed through qualitative processes into meaningful insights that inform policy and practice.

In the input phase, the framework considered a range of demographic and professional variables that influence teachers' engagement with inclusive education and technology. These include respondents' age, gender, and educational background, as well as their teaching subjects, years of experience, and prior involvement in inclusive classrooms. Additionally, the frequency with which teachers use modern educational technologies was examined. These variables provided essential context for analyzing how teachers' personal and professional characteristics may shape their perceptions and practices related to inclusive, technology-supported education (UNESCO, 2017).

The process phase focused on the methodological approach used to examine these inputs. The study relied on qualitative data collection methods, particularly questionnaires and semi-structured interviews, to gather in-depth insights from participants. Once the data was collected, it was analyzed through a process of coding and thematic categorization. This analytical approach enabled the identification of recurring patterns and themes that illuminated the challenges, benefits, and strategies associated with using technology in inclusive educational settings. The use of thematic analysis, as outlined by Miles, Huberman, and Saldaña (2020), ensured that the findings were grounded in the lived experiences and narratives of the participants.

In the output phase, the findings from the data analysis emerged as key themes reflecting current practices and challenges in the field. These themes included the accessibility of digital tools for learners with diverse needs, teachers' readiness to adopt and effectively use inclusive technologies, the extent of institutional support available, and the presence of policy-related barriers that may impede inclusive efforts. Furthermore, the study highlighted effective strategies and best practices for using technology to enhance inclusion. These insights contributed to a deeper understanding of how educational technology can support inclusive practices and provide evidence-based recommendations for improving inclusive education in Bangkok (Al-Azawei, Serenelli, & Lundqvist, 2016).

By structuring the study within the IPO framework, this research offered a comprehensive lens for assessing the dynamic interplay among teacher characteristics, technological tools, and inclusive teaching practices. It enabled the identification of specific factors influencing outcomes and provided a pathway to translate qualitative findings into actionable recommendations for educators, administrators, and policymakers.

METHODOLOGY

Research Design

This study adopted a qualitative case study design to explore the integration of modern technology into inclusive education in selected Pratum schools in the Phasi Charoen District of Bangkok, Thailand. A qualitative design was most appropriate given the study's aim to understand educators' lived experiences, perspectives, and practices within their natural educational settings (Creswell & Poth, 2018). Through in-depth inquiry, the study sought to uncover nuanced insights into the attitudes, perceptions, challenges, and strategies employed by Pratum teachers in implementing inclusive, technology-supported learning environments.

By employing this design, the study did not seek to generalize but rather to contribute context-specific insights that could inform policy development, teacher training, and inclusive education strategies across similar educational settings in Thailand and beyond.

To ensure the trustworthiness and credibility of this qualitative case study, the researcher employed the bracketing method. Bracketing, also known as *epoché*, was a reflective process in which the researcher consciously identified and set aside any personal biases, prior knowledge, or assumptions related to inclusive education and the use of modern technology in classrooms. As the primary instrument for data collection and interpretation, the researcher engaged in continuous self-reflection through memo writing and journaling before, during, and after the data-gathering phase. This was conducted to minimize the influence of subjective perspectives and to focus more objectively on the participants' lived experiences and authentic narratives. Additionally, peer debriefing with a research advisor was conducted to maintain reflexivity throughout the study. This methodological step aligned with the principles of phenomenological research, in which the goal was to understand phenomena from participants' perspectives, thereby enhancing the validity and neutrality of the findings (Creswell & Poth, 2018).

Population and Sampling Technique

This research study included only 10 pre-selected Pratum (elementary) schools in Phasi Charoen District, Bangkok, Thailand. The reason for this choice was mainly for the researcher's geographical convenience; however, it was also noted that no study of this nature had been conducted in this area. Qualitative research emphasizes exploring complex social phenomena in natural settings, offering insights into participants' lived experiences (Nowell et al., 2017). This

study employed a qualitative design to investigate educators' practices and attitudes regarding inclusive education and technology, which could not be fully captured through quantitative methods. Key principles of qualitative research guided this study, including a holistic understanding that emphasized the interconnectedness of factors, a contextual focus on Pratum Schools in Bangkok, and reflexivity to mitigate researcher bias.

This research employed purposive sampling to select participants. Purposive sampling is a technique used in qualitative research where participants are intentionally selected based on specific characteristics, knowledge, or experiences relevant to the study. Instead of selecting participants at random, the researcher used their judgment to select 13 individuals who could provide rich, in-depth insights into the research topic. The reason for employing this sampling technique was to ensure that the participants provided rich, detailed insights into the research questions.

Research Steps

Semi-structured interviews served as the primary data collection tool, chosen for their flexibility in exploring participants' experiences while maintaining a structured framework (Kallio et al., 2016). The procedure began with obtaining formal permission from the school directors of the ten selected Pratum schools in the Phasi Charoen District. Once administrative approval was secured, the researcher contacted potential participants to explain the study's objectives and ensure they met the purposive sampling criteria. Following this, informed consent forms were distributed, outlining the voluntary nature of participation, the right to withdraw at any time, and the measures taken to ensure anonymity and confidentiality.

Following each session, the researcher transcribed the audio recordings verbatim. To maintain the "Human Bridge" between the data and its interpretation, these transcripts were then shared with the respective participants for member checking. This step allowed educators to verify that the written accounts accurately reflected their views and to correct any misconceptions. Finally, the data were organized and secured in a password-protected digital repository, marking the transition from data collection to the thematic analysis phase (Braun & Clarke, 2021; Nowell et al., 2017).

Data Collection and Sample Selection

The first instrument utilized was a researcher-developed demographic questionnaire. This tool served as an initial screening and profiling mechanism to provide a baseline for understanding the 13 participants' professional backgrounds. It captured essential variables such as chronological age, gender identity, and total years of teaching service, specifically distinguishing between general education experience and specialized inclusive education experience. Furthermore, the questionnaire assessed the participants' self-reported proficiency with digital tools and their prior exposure to formal inclusive education training. This quantitative snapshot allowed for the contextualization of the qualitative responses gathered in the subsequent phase (Creswell & Poth, 2018).

The primary instrument for the study was the semi-structured interview guide, designed to facilitate a deep exploration of educators' lived experiences. The guide consisted of open-ended questions categorized into four thematic domains: educator perceptions of inclusion, the practical integration of modern technology, perceived systemic barriers, and innovative instructional strategies. Unlike a structured interview, this format allowed the researcher to utilize follow-up probes to clarify complex responses or to delve deeper into unique classroom narratives that

emerged during the conversation. This flexibility was essential for capturing the "Pragmatic Frustration" and "Learner Engagement Paradox" that characterized the participants' daily professional lives (Kallio et al., 2016).

To ensure the validity and reliability of these instruments, they underwent rigorous validation. The interview guide was initially reviewed by three subject matter experts in special education and educational technology to assess content validity and the clarity of the terminology. Following their feedback, the researcher made necessary adjustments to the phrasing of the questions to ensure they were culturally sensitive and appropriate for the Thai educational context. Furthermore, a pilot study was conducted with two educators from a non-participating Pratum school in a neighboring district. This pilot phase was instrumental in testing the flow of the questions and ensuring that the instrument effectively elicited the data required to answer the study's research questions (Nowell et al., 2017).

Finally, the researcher prepared a technical protocol for the digital recording and transcription of the interviews. This included the use of high-fidelity audio recording equipment and a secure digital storage system to maintain data integrity. The instrument also included a "Member Checking" component, in which participants were given the opportunity to review their interview transcripts for accuracy after data collection was complete. This methodological step was vital for establishing the "Credibility" and "Confirmability" of the research findings, ensuring that the final analysis remained true to the participants' original intent (Lincoln & Guba, 1985; Merriam & Tisdell, 2016).

Data Analysis Methods

This study employed thematic analysis to identify recurring patterns within the collected data. Following the six-step process outlined by Braun and Clarke (2021), the analysis was structured as follows. First, familiarization involved reading transcripts multiple times to gain an in-depth understanding of the content. Second, initial coding was conducted to identify key ideas and extract relevant concepts. Third, theme development occurred by grouping coded ideas into preliminary themes. Fourth, the theme review ensured that the identified themes were refined to maintain accuracy. Fifth, theme definition and naming involved structuring themes to encapsulate the core meaning of the findings. Lastly, the final report production presented thematic findings with supporting quotes to substantiate claims. The analysis was structured to address each research question in the study.

RESULTS AND DISCUSSION

Demographic Profile of the Respondents

To address Research Question 1, this section details the demographic characteristics of the 13 educators interviewed across the ten selected Pratum Schools in the Phasi Charoen District. The participant pool comprised teachers with varying levels of experience, ranging from early-career educators to seasoned professionals with over a decade of classroom service.

Consistent with the study's focus on inclusive education, the majority of respondents possessed a formal educational background in Special Needs Education or Elementary Education. However, a significant finding within this profile was the disparity between inclusive pedagogical knowledge and technical training. While respondents reported high levels of formal training in managing diverse learning needs, their exposure to specialized "modern technology" training was largely informal or self-taught. This demographic context is crucial to understanding the Professional Development and Readiness theme discussed later in this chapter, as it highlights a

gap between educators' desire to implement technology and their perceived technical self-efficacy.

The demographic profile of the 13 teacher-respondents reveals a diverse range of professional backgrounds and varying levels of technological preparedness. As illustrated in Table 1, the participants' teaching experience spans from less than one year (Teacher E) to over a decade (Teacher H), with a significant concentration of educators in the early stages of their careers (1–3 years). This distribution is particularly relevant to the study's focus on modern technology, as early-career teachers often encounter a gap between theoretical training and classroom reality. Regarding pedagogical focus, the respondents primarily serve the Pratum levels, with many handling multiple subjects or specializing in English and Mathematics across Grades 1 through 6. Notably, the data regarding technology training reveals a critical disparity. While approximately 46% of the participants (n=6) reported no formal training in educational technology, those who did receive training often characterized it as either "partial" (Teacher C) or "non-applicable" to their specific classroom contexts (Teacher M). This lack of standardized, practical training across the ten schools suggests that many educators rely on informal, peer-mediated learning or self-directed trial and error to integrate digital tools into their inclusive classrooms.

Analysis of Teaching Experience

The respondents were categorized into three professional stages based on their years of service: (a) Novice (0–3 years), (b) Mid-Career (4–9 years), and (c) Veteran (10+ years). This categorization facilitates a clearer understanding of how professional maturity influences the adoption of technology in inclusive settings.

Table 1

Distribution of Respondents by Teaching Experience (N=13)

Experience Category	Years of Service	Teacher Respondents	Total (n)	Percentage (%)
Novice	0–3 Years	B, D, E, F, G, J, L	7	53.80%
Mid-Career	4–9 Years	A, C, I, K, M	5	38.50%
Veteran	10+ Years	H	1	7.70%
Total			13	100%

As shown in Table 1, the majority of the educators involved in the study are in the Novice stage of their careers, representing 53.8% of the total sample. This suggests that the ten selected Pratum schools in Phasi Charoen are largely staffed by early-career teachers who may be more receptive to "modern technology" but, as evidenced in the qualitative data, often lack the institutional support to implement these tools effectively.

The Mid-Career group (38.5%) represents a significant portion of the workforce, providing a balance between pedagogical stability and technological integration. Interestingly, the Veteran category is represented by only one respondent (7.7%), Teacher H. The insights provided by Teacher H are particularly valuable, as they offer a longitudinal perspective on how technology has shifted classroom dynamics over more than a decade of teaching. This distribution highlights a potential "generational" shift in the district's workforce, in which the push for digital inclusion is being led by a younger demographic that simultaneously faces the highest levels of resource scarcity.

The data indicate a high concentration of English language instruction among the respondents, with emerging diversity in Mathematics, Science, and Health. To address Research Question 1, Table 2 illustrates how these specializations are distributed across the Pratum levels (Grades 1–6).

Table 2

Distribution of Respondents by Subject Specialization (N=13)

Subject Area	Teacher Respondents	Total (n)	Percentage (%)
English Language	A, B, C, D, E, F, J	7	53.80%
Mathematics/Science	I, K, E*	3	23.10%
Multi-Subject/Generalist	H, L, M	3	23.10%
Arts, Health, & PE	G	1	7.70%

**Note: Teacher E is recorded in both English and Science categories to accurately reflect their dual-subject teaching load; consequently, the total percentage exceeds 100%.*

As evidenced in Table 2, the instructional landscape of the selected schools is English-dominant, with 53.8% of the participants specializing in English as a Second Language (ESL) instruction. This specialization is significant for the study's findings, as these educators frequently utilize technology for Assisted Multimodality—using digital tools to bridge the gap between Thai and English through visual and auditory stimuli.

Analysis of Technological Training and Preparedness

A critical component of Research Question 1 concerns educators' technological readiness. The data revealed a significant disparity between formal certification and practical classroom applicability. Respondents were categorized based on the nature of their training: (a) No Formal Training, (b) Formal Training (Certificates/Diplomas), and (c) Informal/Peer-Mediated Training.

Table 3 *Levels of Technological Training Among Respondents (N=13)*

Training Category	Teacher Respondents	Total (n)	Percentage (%)
No Formal Training	A, E, F, G, H	5	38.50%
Formal Training (Seminars/Certificates)	B, D, J, K, L, M	6	46.10%
Informal / Peer-Mediated	C, I	2	15.40%

The analysis in Table 3 shows that while nearly half of the respondents (46.1%) have participated in some form of formal technology training, this does not necessarily translate into high levels of digital self-efficacy. Qualitative data from these participants (specifically Teacher M and Teacher C) suggest a Training Applicability Gap, where formal seminars often fail to address the specific infrastructural limitations—such as "brownouts" or lack of 1:1 devices—found in Phasi Charoen schools.

In alignment with the qualitative framework of Sharan B. Merriam, the following analysis provides a deep, descriptive interpretation of the socio-economic barriers faced by educators in

Phasi Charoen. This analysis moves beyond identifying challenges to exploring the "meaning-making" process of teachers who navigate the gap between technological potential and the stark economic realities of their students.

Addressing Research Question 2, Major Challenges

In addressing Research Question 2, which investigates the major challenges encountered by educators, the findings reveal a complex intersection of environmental and social barriers that fundamentally impede the inclusive mandate. Following the interpretive framework of Sharan B. Merriam (2009), these challenges are not merely technical glitches but are systemic realities that shape the "lived experience" of both teachers and students.

While the most pervasive Master Theme was the volatile nature of the power grid, the data also revealed a secondary layer of "Minor Technical Glitches" that frustrated the educators' attempts at modernizing their lessons. This challenge was less about the electricity and more about the widening gap between aging hardware and modern software requirements. A few participants, specifically Teachers B and H, highlighted that even when the power was stable, the school-provided tablets were often too outdated to support the latest versions of essential inclusive apps like Canva or Kahoot. This led to a "software-hardware mismatch" that made the teachers feel as though they were fighting the tools themselves.

Teacher B shared her frustration with this "lag":

"Sometimes the lights are on, but the tablet just won't open the app. It says 'Version not supported.' I want to use the new templates for my students with learning disabilities, but the hardware is from five years ago. It makes me feel like I'm falling behind even when I'm trying my best to stay updated."

Similarly, Teacher H described the "Minority Variant" of hardware failure:

"I tried to run a collaborative design session, but the tablets kept crashing because the memory was too low for the newer Canva updates. It's not a power outage, but the result is the same—the lesson stops, and the students become frustrated spectators again."

While these technical glitches were not as frequent as the master theme of Power Volatility, they represent a significant "secondary barrier." They prove that even with a stable environment, Systemic Infrastructure must also include up-to-date hardware to truly support a teacher's Instructional Agency.

The participant narratives revealed a series of secondary challenges that, while less frequent than power volatility, significantly impacted the effectiveness of inclusive education. One such minority theme was the Language Barrier in Digital Interfaces, which highlighted the English-centric design of many modern educational tools. For students in the Phasi Charoen district—particularly those already navigating learning disabilities—the use of foreign-language software created a "Double Barrier" to participation. Teacher D illustrated this pedagogical struggle, noting that even when connectivity was stable, the software itself remained inaccessible:

"The apps like Canva or Kahoot are mostly in English. For my students, especially those who struggle with reading, they get confused by the buttons. I have to spend half the lesson translating 'Download' or 'Share' instead of teaching the actual subject." This finding deepens the study's Socio-Economic theme by demonstrating

that global technology is often not "localized" for the specific needs of Thai elementary learners, requiring teachers to act as translators rather than facilitators.

Further complicating the integration of technology were the Physical Space Constraints inherent in the school's architecture. Several educators observed that modern inclusive technology requires a flexible classroom layout that their traditional buildings simply do not support. This represents a secondary Environmental Challenge, where the "fixed" nature of the classroom hinders the "fluid" nature of digital learning. Teacher L highlighted the spatial difficulty of balancing hardware needs with a rigid environment:

"Our classrooms are small and the desks are bolted down in rows. To use the tablets and have students collaborate, we need to move around, but there aren't enough charging ports along the walls. We end up huddled in one corner near the single working outlet, which makes the room crowded and loud." These spatial limitations suggest that the "Infrastructure" challenge is not merely about power or internet, but about a fundamental mismatch between 21st-century tools and 20th-century classroom design.

Finally, the data brought to light a "Hidden Maintenance" Burden, which adds a new dimension to the theme of Teacher Agency. While the "Personal Resource Subsidy" typically refers to financial sacrifices, this finding reveals a significant "Time Subsidy" required to keep technology functional. In the absence of dedicated IT support, teachers are forced to absorb the role of technical maintenance staff. Teacher J shared a poignant insight into this exhaustion:

"People think tech saves time, but I spend my entire lunch break deleting old files from the tablets or updating the apps because there is no IT person to do it. It's a minor thing each day, but by Friday, I am exhausted before the first bell even rings."

This reinforces the finding that teachers in these under-resourced settings are not just "troubleshooters" during active instruction; they are the primary, unpaid maintainers of the digital ecosystem, further stretching their professional agency to the point of fatigue. The primary challenges identified in the Phasi Charoen district are rooted in the master theme of Systemic Infrastructure and Power Volatility. The narratives provided by the 13 participants suggest that the digital environment in these schools is defined by its inherent "fragility." Modern technology, which is designed to be a seamless utility, becomes a source of instructional anxiety when the foundational support systems are unreliable.

Teacher K provided a poignant account of how this infrastructure—or lack thereof—directly dictates the success of a lesson:

"When there is no power... or electricity, we cannot use the technology or media prepared for students. Even if we have a lesson ready, everything stops. We have to change our way of teaching suddenly."

This indicates that the "modern" classroom is often held hostage by "pre-modern" infrastructure. When the power fluctuates or the internet "lags," as noted by Teacher B and Teacher J, the pedagogical momentum is shattered. For students with special educational needs (SEN), who often require consistent sensory cues and structured environments, these disruptions are not just inconveniences; they are barriers that disconnect them from the learning process. This "stuttering

pedagogy" forces teachers to maintain a taxing dual-track system, constantly prepared to pivot to analog methods when the digital "bridge" collapses.

Socio-Economic Inequity and the Crisis of Digital Spectatorship

Beyond the physical hardware and electrical grids, the challenge of Socio-Economic Inequity (Theme 2) emerged as a profound and persistent barrier to inclusion. The qualitative data highlights a stark disconnect between the state's digital aspirations and the students' economic realities.

Teacher D emphasized that the "survival mode" of student families fundamentally precludes the purchase or maintenance of personal digital devices:

"The school cannot fully provide them, and some families cannot afford them... their priority is family survival [rather] than gadgets. If I ask them to buy something for school, I feel pity because I know they struggle just for food."

This socio-economic gap creates a phenomenon identified in the data as "Digital Spectatorship." This occurs when a teacher attempts to integrate technology—such as an interactive app or a digital manipulative—but is limited by a lack of 1:1 device availability. In this scenario, the student without a device is relegated to the role of an observer rather than a participant. Teacher M described this breakdown of agency clearly:

"In the classroom setup... the students just watch. They cannot experience the modern technology by themselves."

From an inclusive pedagogical standpoint, this is a critical failure. True inclusion requires learner agency—the ability for the student to act upon and influence their learning environment. When poverty strips away this agency, the technology ceases to be an equalizer and instead becomes a visible marker of social status and economic disparity. Thus, the challenges faced by educators in Phasi Charoen are multifaceted: they are physical in the form of unstable infrastructure, and they are social in the form of an economic "toll bridge" that many students simply cannot afford to cross. These combined barriers force teachers into a role of constant mediation, attempting to bridge a gap that is as much psychological as it is material.

Addressing Research Question 3: Perceptions and Attitudes of Educators

In addressing Research Question 3, which investigates educators' perceptions and attitudes toward the use of modern technology for inclusion, the findings reveal a nuanced internal landscape. These attitudes are not merely "positive" or "negative" but are deeply influenced by the practical realities of the Phasi Charoen district. Following the interpretive framework of Sharan B. Merriam (2009), these perceptions are understood as "constructed meanings" that teachers develop in response to their environment.

However, this positive perception was often countered by the Training Applicability Gap. Several teachers, such as Teacher M, noted that while they perceived technology as useful in theory, the professional development they received felt "out of touch" with the reality of a Phasi Charoen classroom. This led to a secondary perception of technology as a "High-Maintenance Luxury"—something that works in a perfect environment but requires excessive effort in a resource-constrained one. Furthermore, the data showed a Synchronous Learning Struggle, in

which teachers perceived using new tech as a source of cognitive overload, as they often had to master the software and teach it simultaneously.

The prevailing attitude among the 13 participants is defined by the master theme of Pragmatic Frustration (Theme 3). The qualitative data indicate that educators do not harbor an ideological resistance to technology; in fact, most perceive it as an essential "bridge" to inclusive education. However, this optimism is tempered by the daily struggle of implementation.

Teacher C summarized this duality of perception, viewing technology as a vital tool while simultaneously mourning its lack of accessibility:

"Technology is not just tools; it is a bridge. But the big problem is accessibility... it is a disadvantage when the bridge is there but you cannot reach it. I want to use it, but I feel frustrated when I see the gap." (Teacher C)

This "frustration" is a significant finding regarding teacher attitudes. It suggests that the educators' professional identity is tied to their desire to provide equitable learning, yet they feel "weighed down" by a system that fails to provide the necessary support. Consequently, their attitude is one of Pragmatic Resignation—they support the *concept* of digital inclusion but are exhausted by the *reality* of its execution. This is particularly evident among the novice teachers identified in RQ1, who enter the profession with high digital literacy but quickly encounter the "pedagogical wall" of resource scarcity.

The Engagement Paradox

A second, more nuanced attitude emerged regarding the quality of student engagement, identified as the Engagement Paradox (Theme 4). While teachers generally perceive technology as a "fix" for behavioral issues—keeping students quiet and focused—they harbor a deep-seated caution regarding whether this focus translates into actual learning.

Teacher A articulated a common fear that high-sensory stimulation can lead to a passive, almost hypnotic state:

"The kids were looking at the screen, but they were like robots... they were just staring, not thinking. They just follow the light and the sound, but they don't process the meaning." (Teacher A)

The Perception of Technology as a Behavioral Stabilizer

A significant portion of the educators' attitudes (RQ3) is tied to the perception of technology as a tool for Digital Behavioral Management. In inclusive settings, where students may struggle with emotional regulation or hyperactivity, teachers perceive "modern technology" (RQ5) as an essential mediator of the classroom climate.

Teacher F and Teacher G both shared an attitude of reliance on these tools to maintain a productive learning environment:

"Without the media or the games like Baamboozle, it is very hard to keep their attention. They get distracted or start to play with each other. The technology makes them stay in their seats." (Teacher F)

The Attitude of "Instructional Burden" and Ethical Responsibility

Another layer of the educators' attitudes is the perception that technology integration is an individual responsibility rather than a systemic one. This perception is closely linked to their professional integrity. Because they see the potential of technology to help students with special needs, they feel an ethical "pull" to use it, even when the system makes it difficult.

Teacher, I expressed this sense of burdened commitment:

"I feel like I have to do it. If I don't use these modern tools, my students will be behind other schools. It is a lot of work for me to find and prepare everything on my own, but if I don't, I am not a good teacher for them." (Teacher I)

The Psychological Shift: From Facilitator to Mediator

Finally, the educators' perceptions reflect a fundamental shift in how they view their own value in the classroom. There is a growing attitude that the teacher's role has evolved from being a "Source of Knowledge" to a "Mediator of Digital Reality." Teacher B noted that their attitude toward their own teaching has changed:

"Before, I thought I was the one teaching. Now, I feel I am the one helping them understand what the screen is saying. I am the bridge between the computer and the child." (Teacher B)

Addressing Research Question 4, Teaching Practices

In addressing Research Question 4, which investigates how educators navigate systemic challenges through their teaching practices, the findings reveal a high degree of Instructional Resilience. In the Phasi Charoen district, "practice" is not merely the delivery of a lesson; it is a series of strategic maneuvers designed to bypass infrastructure failures and socio-economic gaps. Following Merriam's (2009) framework, these practices are understood as "adaptive responses" in which teachers exercise their agency to uphold the inclusive mandate.

Personal Resource Subsidy

One of the most significant practices identified in this study is the Personal Resource Subsidy (Theme 3). The data shows that when the institutional infrastructure fails to provide the necessary hardware for "modern technology" (RQ5), teachers do not simply abandon their digital goals. Instead, they shift the financial and logistical burden onto themselves.

Teacher E provided a stark example of this practice, revealing that the presence of technology in the classroom is often due to the teacher's personal property:

"Only the TV is provided. The laptop is mine... I bought it myself for my students because the school cannot provide one for every classroom. If I don't bring my own, we have nothing." (Teacher E)

The Practice of Mediated Facilitation

To address the Engagement Paradox (Theme 4), educators have developed the practice of Mediated Facilitation. This practice is a direct response to the "Robot-like" learning (RQ3) that occurs when students passively consume digital content. Teachers have learned that for technology to be "inclusive," the teacher must remain the central protagonist of the lesson.

Teacher I explained how this practice functions as a cognitive bridge:

"I don't just play the video. I have to stop it every 2 minutes. I have to ask, 'What did he say?' or 'Why did that happen?' If I don't stop it, they just drift away... they just follow the light." (Teacher I)

Grouped-Access and Collaborative Scarcity

Finally, to navigate the challenge of Socio-Economic Inequity (Theme 2), teachers have institutionalized the practice of Grouped-Access. Because 1:1 device ratios are impossible due to poverty and lack of school funding, teachers have turned a resource deficit into a social strategy.

Teacher D described how they manage the lack of gadgets:

"The students work in groups... we have one phone for five people. I make them take turns. It teaches them to help each other, especially the students who are slower." (Teacher D)

While this practice is born of necessity, it has become a unique form of Peer-Supported Inclusion.

Addressing Research Question 5, Specific Modern Technologies

In addressing Research Question 5, which identifies the specific modern technologies currently utilized in the Phasi Charoen inclusive classrooms, the findings illustrate a strategic selection process. These tools are not chosen based on high-cost or complexity; rather, they are selected for their versatility, low-bandwidth requirements, and social accessibility. Following Merriam's (2009) framework, these choices represent a "pragmatic adaptation" to the socio-economic and infrastructural constraints previously discussed.

The technological landscape of these schools is characterized by what can be termed "Accessible Modernity." Because teachers are often subsidizing the costs and navigating unstable internet (RQ2), they gravitate toward platforms that offer high visual engagement with minimal technical overhead.

Multimedia and Video-Based Learning (YouTube and Smart TVs)

The most ubiquitous technologies identified across all 13 participants are YouTube and Smart TVs. These tools serve as the primary medium for delivering inclusive content. In the context of special education, these visual "anchors" are essential for students who struggle with abstract text-based instruction.

Teacher J and Teacher F highlighted YouTube as their "go-to" resource:

"YouTube is the most important. It has the songs, the cartoons, and the visual signs that my special students need to follow the lesson. If I just speak, they don't listen; if I play YouTube, they are focused." (Teacher J)

Creative and Graphic Design Tools (Canva)

A significant finding in the data is the widespread use of Canva for creating inclusive learning materials. Unlike traditional textbooks, Canva allows teachers to customize visuals to meet the diverse needs of their students—such as increasing font sizes for students with visual impairments or creating simplified infographics for those with cognitive delays.

Teacher D shared how this tool empowers both the teacher and the student:

"I use Canva to make my own cards and posters. It is modern and beautiful, and the kids like it. Sometimes, I let the students try to design their own simple cards. It makes them feel like they are creating something." (Teacher D)

Gamification and Interaction Platforms (Kahoot and Baamboozle)

To combat the passivity of "Robot-like" learning, educators utilize gamification tools such as Kahoot and Baamboozle. These platforms are specifically chosen for their ability to transform a standard assessment into a social, competitive event.

Teacher G noted the behavioral benefits of these tools:

"Baamboozle is very good because it doesn't need every student to have a phone. We can play as a team on the one big TV. It makes the inclusive students participate with their friends." (Teacher G)

This specific choice is a direct response to the Socio-Economic Inequity (Theme 2). By choosing "team-based" games, teachers mitigate the lack of 1:1 devices, ensuring that students without gadgets (RQ2) are still included in the "modern" experience.

Communication and Mobile-First Tools (LINE and Facebook)

Finally, the research identifies LINE and Facebook as critical "Modern Technologies" for inclusive education. In the Phasi Charoen district, the "classroom" often extends into these mobile apps because they are the only platforms consistently accessible to parents and students on low-cost data plans.

Teacher A and Teacher M described using LINE to bridge the school-home gap:

"We use LINE to send the homework and the videos to the parents. Most parents don't have a computer, but they all have LINE on their phone. It is the only way to keep the inclusive students learning after they leave the school." (Teacher A)

SUMMARY

This section provides a consolidated summary of the study's findings, organized by the five Research Questions that guided the inquiry. These findings represent the synthesis of the 13 participant interviews and the thematic analysis conducted in Chapter 4.

RQ1: Profile of Participants The participants consisted of 13 educators from the Phasi Charoen district, representing a diverse range of teaching experience and digital literacy levels. The data revealed a notable trend: while younger, novice teachers (1–5 years of experience) had higher technical proficiency, veteran teachers (over 15 years of experience) demonstrated a higher degree of "Pedagogical Flexibility," or the ability to adapt to classroom disruptions without losing instructional focus.

RQ2: Major challenges: The study identified two primary categories: Environmental and Socio-Economic. Environmentally, "Power Volatility" and unstable internet infrastructure (lag) were identified as constant disruptors. Socioeconomically, the "Survival vs. Gadget" conflict creates a state of "Digital Spectatorship," in which students living in poverty lack access to the personal devices required for active participation in the digital curriculum.

RQ3: Teacher Attitudes and Perceptions Educators' attitudes are characterized by "Pragmatic Frustration." While they view technology as a vital "bridge" for inclusion, they feel burdened by the lack of institutional support. Furthermore, the "Engagement Paradox" revealed a cautious attitude: teachers perceive high-sensory digital tools as effective for behavioral management, but remain skeptical of their ability to foster deep cognitive engagement without constant human mediation.

RQ4: Navigational Practices. To overcome these barriers, teachers engage in two primary compensatory practices: Personal Resource Subsidy and Mediated Facilitation. Teachers routinely use their own finances to provide hardware (laptops) and connectivity (mobile data hotspots). Pedagogically, they use "Mediated Facilitation" by frequently pausing digital content to ensure students process information rather than passively consume it.

RQ5: Specific Technologies Utilized The technologies utilized in the district follow a "Logic of Resilience." Tools like YouTube, Canva, Kahoot, Baamboozle, and LINE are preferred because they are free, mobile-friendly, and support visual scaffolding. These tools allow teachers to maintain an inclusive environment despite the lack of 1:1 device ratios and limited school funding.

CONCLUSIONS

Based on the thematic analysis and the summary of findings, these overarching conclusions per research question can be drawn regarding the state of digital inclusion in the Phasi Charoen district:

1. The study revealed that novice teachers possess strong digital literacy and are skilled in using modern technologies, but they often struggle to manage unexpected classroom disruptions and adapt their teaching strategies during technological failures. In contrast, veteran teachers demonstrated greater pedagogical flexibility and classroom management skills, enabling them to sustain an inclusive learning environment even when technology did not function properly. Their experience enabled them to transition smoothly between digital and traditional teaching methods to ensure all learners remained engaged.

These findings support the upgraded TPACK framework (Mishra, 2019), which emphasizes that effective technology integration requires not only technical knowledge but also the combination of pedagogy, content knowledge, and contextual understanding to address the diverse needs of students in inclusive classrooms.

2. The study found that technology-supported inclusive education was hindered by environmental and socio-economic barriers. Unstable electricity and internet connectivity frequently disrupted digital lessons, forcing teachers to adjust their teaching strategies. At the same time, many students from low-income families lacked access to personal gadgets due to financial limitations. This created "Digital Spectatorship," where disadvantaged students could only observe rather than actively participate in technology-based learning. As a result, technology sometimes widened educational inequality instead of promoting inclusion, highlighting the need for better access to devices and stronger technological support in schools.

3. The study found that educators experienced "Pragmatic Frustration," where they strongly supported inclusive education and recognized technology as an important tool for reaching diverse learners, yet struggled with limited training, insufficient time, unstable resources, and lack of institutional support. Teachers viewed technology as effective in improving student engagement, participation, and classroom management, especially through interactive and visual

platforms. However, many questioned its ability to promote deep and meaningful learning when used alone. The findings further revealed that educators considered technology as a supplement rather than a replacement for teaching, emphasizing that human guidance, empathy, classroom experience, and continuous teacher involvement remain essential in creating a truly inclusive learning environment.

4. The study found that teachers addressed the challenges of technology-supported inclusive education through pedagogical flexibility, personal resource subsidy, and mediated facilitation. Many educators used their own money to provide gadgets, internet access, and other digital resources to support students, especially those from low-income families. Teachers also guided students closely by explaining digital content, checking understanding, and adjusting lessons to meet diverse learning needs. These practices showed that the human element remains essential in ensuring that technology supports inclusion rather than becoming a barrier to learning.

5. The study found that teachers selected technologies based on accessibility, affordability, and reliability in low-resource classrooms. Platforms such as YouTube, Canva, Kahoot, Baamboozle, and LINE were commonly used because they were mobile-friendly, accessible, and effective for supporting inclusive learning. These tools provided visual and interactive learning experiences that helped students with diverse needs better understand lessons and participate actively. The use of LINE also improved communication among teachers, students, and families by leveraging a familiar, widely accessible platform. Overall, the findings showed that teachers prioritized practical, accessible technologies that could effectively support inclusion despite limited resources and school infrastructure.

RECOMMENDATIONS

In light of the study's findings, the following recommendations are presented to enhance the implementation of inclusive education through technology and to address the challenges experienced by teachers and learners.

1. School administrators may consider enhancing educator readiness through intergenerational mentoring based on the profile of participants in the Phasi Charoen district. It is recommended that school administrators implement intergenerational peer-mentoring programs to bridge the gap between technical literacy and pedagogical maturity. Rather than traditional top-down training, schools should pair novice teachers with high digital proficiency with veteran teachers with superior pedagogical flexibility. In this model, novice teachers can provide just-in-time technical support, while veteran teachers mentor their younger peers in maintaining classroom flow and an inclusive focus when technology fails. This approach creates a balanced ecosystem where technology, pedagogy, and content knowledge are integrated through collaborative professional development.

2. The Ministry of Education and local government units may prioritize hardware subsidies and offline-ready infrastructure to mitigate power volatility and unstable internet to address the environmental and socio-economic challenges identified in the study. Schools should invest in uninterruptible power supplies for computer labs and promote the use of educational software that does not require constant high-speed connectivity. To eliminate the state of digital spectatorship among students living in poverty, a community-based device-lending library should be established to ensure that all learners have equal access to the necessary hardware to actively participate in the digital curriculum.

3. Educational policymakers may consider cultivating positive teacher attitudes through institutional support to alleviate the pragmatic frustration expressed by educators. Educational policymakers may shift their focus from software procurement to the creation of robust institutional support systems. Professional development programs should move away from basic technical workshops and instead focus on human-mediated digital pedagogy. These sessions should explicitly address the engagement paradox by teaching educators how to use digital tools to foster deep cognitive engagement rather than merely behavioral management. By validating the teacher's essential role as a facilitator, institutions can reduce the professional burden and foster a more positive attitude toward technological integration.

4. School districts may consider formalizing navigational and compensatory practices regarding the navigational practices of teachers. The study recommends that school districts formalize compensatory strategies by shifting the financial burden from individual educators to the institutional budget. Schools should establish a digital classroom emergency fund to cover the costs of mobile data and hardware maintenance that teachers currently provide through personal resource subsidies. Additionally, mediated facilitation should be recognized as a best-practice strategy in inclusive lesson planning. By encouraging the use of strategic pausing and scaffolded explanations as standard techniques, schools can ensure that technology remains an active tool for meaning-making for all students.

5. Curriculum designers may perform strategic integration of resilient and accessible technologies, given the logic of resilience found in the specific technologies utilized by teachers. Curriculum designers should officially endorse and provide specialized training for low-bandwidth, mobile-friendly platforms. Instead of mandating expensive and complex learning management systems, districts should optimize their digital curricula for tools that have already proven effective in the local context, such as LINE, Canva, and YouTube. Resource allocation should focus on creating high-quality, localized templates for these platforms that support diverse learning needs and visual scaffolding, ensuring they remain accessible to students regardless of their device type or the school's funding levels.

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