

Teachers' Lived Experiences of Integrating Technology in Classroom Instruction

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Abstract. This qualitative phenomenological study examined teachers' lived experiences of integrating technology into classroom instruction. It explored their perceptions of technology use, the challenges they encountered, the adaptive strategies they employed, and the meanings they ascribed to technology integration in instructional practice. Data were collected through in-depth semi-structured interviews with selected teachers and analyzed using thematic analysis. Findings revealed that technology integration is a context-dependent and pedagogically mediated practice shaped by structural constraints and teacher agency. Participants reported persistent challenges related to unstable internet connectivity, limited access to devices, and inadequate technological resources, which constrained the effective use of digital tools in classroom instruction. Despite these limitations, teachers demonstrated adaptability by employing alternative strategies such as offline resources, scaffolded instruction, peer collaboration, and flexible lesson planning to sustain student engagement and learning continuity. Technology was perceived as beneficial in organizing instruction, clarifying concepts, and increasing learner participation when purposefully aligned with instructional objectives. The findings further underscored the role of reflective practice in enabling teachers to evaluate and refine their technology integration strategies. Participants also emphasized the need for sustained professional development to strengthen their technological and pedagogical competencies. Effective technology integration emerged not as the simple adoption of digital tools but as a deliberate, context-sensitive process of aligning technology with pedagogical goals, learner needs, and classroom realities. In response, the study proposes a context-based Technology Integration Enhancement Program to support teachers through capacity-building, collaborative learning, and reflective professional development. The study contributes to the literature on technology integration in resource-constrained educational settings and offers practical insights for strengthening teacher support and instructional practice.

Introduction

The integration of digital technology into classroom instruction has become a defining feature of contemporary education. Globally, educational institutions increasingly utilize digital tools and platforms to improve instructional delivery, strengthen learner engagement, and develop 21st-century skills such as collaboration, creativity, and critical thinking. In the Philippines, the Department of Education operationalized several initiatives, including the ICT4E Strategic Plan and K to 12 curriculum reforms, to promote technology integration and prepare learners for a technology-driven society. These reforms highlighted the government's commitment to enhancing the quality and accessibility of education through digital innovation.

However, despite these advancements, challenges in technology integration continue to persist, particularly in public secondary schools. According to Arante and Bascon (2025), barriers such as limited infrastructure, inadequate teacher

training, insufficient technical support, and unstable internet connectivity continue to affect teachers' effective use of technology in instruction. These concerns became more evident during and after the COVID-19 pandemic when teachers were compelled to adopt online and digital learning platforms to sustain instruction amidst disruptions. While technology created opportunities for flexible and innovative learning, it also exposed inequalities in access to digital resources and varying levels of technological competence among educators and learners.

Moreover, several studies emphasized that teachers' pedagogical beliefs, self-efficacy, and institutional support significantly influence successful technology integration (Ramnarain et al., 2023; Zhi et al., 2023). Local studies further revealed that teachers recognized the value of technology in enhancing learning experiences, yet many remained constrained by limited digital resources, inconsistent administrative support, and inadequate professional development opportunities (Espinosa et al., 2023). These challenges often resulted in the underutilization of available technologies and forced teachers to rely on traditional instructional practices when digital tools became inaccessible or unreliable.

Conversely, much of the existing literature focused primarily on technical and institutional factors through quantitative approaches, overlooking the deeper personal and contextual experiences of teachers in navigating technology integration. This gap is particularly evident in semi-urban and rural public schools where educational environments differ significantly from technologically advanced institutions. As emphasized by phenomenological inquiry, understanding teachers' lived experiences provides meaningful insights into how educators interpret, adapt, and respond to the realities of technology use in classroom instruction.

In view of these conditions, this study examined the lived experiences of teachers in integrating technology into classroom instruction at Libertad National High School in Libertad, Butuan City. Through a phenomenological framework grounded in Social Constructivism and Phenomenology, the study explored teachers' experiences, challenges, adaptation practices, and perceived strategies for effective technology integration. By understanding these lived experiences, the study aimed to provide insights that may contribute to the development of context-responsive professional development programs, institutional support systems, and sustainable instructional practices that strengthen technology integration in public secondary schools.

Objectives of the Study

The present study explored the lived experiences of teachers in integrating technology into classroom instruction at Libertad National High School. Given the increasing demand for technology-enhanced learning and the persistent challenges encountered in public secondary schools, the study aimed to examine teachers' experiences, challenges, adaptation practices, and perceived strategies related to technology integration.

Specifically, the study sought to answer the following questions:

1. How do teachers at Libertad National High School experience integrating technology into classroom instruction?
2. What challenges do teachers encounter, and what adaptation practices do they employ in integrating technology?
3. What themes emerge from the lived experiences of teachers regarding technology integration?
4. Based on the findings, what program or framework may be proposed to support teachers in effectively integrating technology into classroom instruction?

By understanding these lived experiences, the study aimed to provide insights that may strengthen instructional innovation, improve professional development initiatives, and promote meaningful and sustainable technology integration in public secondary schools.

Scope and Limitation

The study primarily explored teachers' lived experiences in integrating technology into classroom instruction at Libertad National High School in Libertad, Butuan City. It specifically examined teachers' perceptions, challenges encountered, adaptation practices employed, and strategies recommended to improve technology integration in teaching and learning processes.

The study utilized in-depth interviews and thematic analysis within a phenomenological framework. It focused solely on teachers who had at least one year of teaching experience and had utilized digital tools in classroom instruction. The perspectives of students, school administrators, policymakers, and other stakeholders were excluded to maintain the specificity and depth of the inquiry.

Additionally, the findings were limited to the context of Libertad National High School and may not be generalizable to all public secondary schools in the Philippines. The study was shaped by the specific socio-cultural and institutional conditions of the school, including access to digital resources, internet connectivity, and available support systems. Since the data relied on participants' self-reported experiences, responses may have been influenced by personal perceptions and preferences in discussing challenges and instructional practices.

Lastly, the study did not employ quantitative measures to determine the effectiveness of technology integration on student performance or learning outcomes. Instead, it provided an interpretive and thematic account of teachers lived experiences in integrating technology into classroom instruction.

Methodology

Research Design

This study utilized a qualitative phenomenological research design to investigate the lived experiences of teachers in integrating technology into classroom instruction at Libertad National High School in Libertad, Butuan City. This approach was employed to gain an in-depth understanding of how teachers perceived the role of technology in teaching and learning, the challenges they encountered, and the adaptation practices they utilized in addressing barriers to effective technology integration within the classroom setting.

Selection of Co-Participants

The researcher employed purposive sampling to select teachers who could provide meaningful and experience-based insights related to technology integration in classroom instruction. The study identified eight licensed teachers from Libertad National High School who were currently teaching junior and senior high school subjects involving the use of digital tools and instructional technologies. All identified participants voluntarily agreed to participate in the study.

To ensure the depth and relevance of the data gathered, the following criteria were considered in selecting the co-participants: (1) currently employed as a teacher at Libertad National High School during the conduct of the study; (2) actively teaching subjects requiring or utilizing technology integration in classroom instruction; and (3) possessing at least one year of teaching experience and prior engagement with digital tools or educational platforms. The inclusion of participants from different subject areas and teaching levels provided diverse perspectives regarding the integration of technology in instructional practices.

Data Gathering Procedures

The researcher explored the lived experiences of teachers in integrating technology into classroom instruction using a semi-structured interview guide aligned with the study's research objectives. Prior to data gathering, approval was secured from the appropriate university authorities and the school administration of Libertad National High School. Participants were informed regarding the purpose of the study, confidentiality of responses, and their voluntary participation.

Interviews were conducted either face-to-face or through secure online platforms, depending on the availability and convenience of the participants. Each interview lasted approximately 30 to 45 minutes and was audio-recorded with the participants' permission. Field notes were also documented to capture non-verbal responses and contextual observations relevant to the study.

The interview guide focused on teachers' perceptions of technology integration, challenges encountered, adaptation practices employed, institutional support, and recommendations for improving technology-enhanced instruction. Probing questions were utilized to encourage deeper reflection and clarification of responses. After the interviews, the recordings were transcribed verbatim, and member checking was conducted to validate the accuracy of the participants' statements. All digital and printed data were securely stored to ensure privacy and confidentiality.

Research Instrument and Validation

The primary instrument used in this study was a semi-structured interview guide containing open-ended questions designed to capture participants lived experiences in integrating technology into classroom instruction. The interview questions explored teachers' perceptions of educational technology, barriers encountered in implementation, adaptation strategies, and recommendations for strengthening technology integration practices in schools.

To strengthen the credibility and validity of the instrument, the interview guide underwent expert validation by specialists in educational technology, curriculum development, and qualitative research. The validators examined the clarity, relevance, coherence, and alignment of the questions with the objectives of the study. Suggestions and recommendations from the validators were incorporated to improve the final version of the instrument. Additionally, pilot interviews were conducted to ensure the comprehensibility and appropriateness of the questions.

Thematic Reflection

In exploring teachers' lived experiences in integrating technology into classroom instruction, thematic reflection served as the interpretive process that guided the researcher's engagement with participants' narratives. Anchored in phenomenology and thematic analysis, the study focused on understanding how teachers made sense of their experiences, instructional practices, and adaptation strategies in relation to technology integration.

Unlike the technical procedures of coding and categorization, thematic reflection emphasized the interpretive responsibility of the researcher in examining the meanings embedded within participants' narratives. Through repeated reading and reflection, the researcher identified recurring insights, tensions, challenges, and adaptive practices that shaped teachers' experiences in technology-enhanced instruction. This process enabled the study to move beyond simple description toward a deeper interpretation of how teachers navigated instructional demands, technological limitations, and institutional expectations.

Thematic reflection also highlighted how teachers' experiences were influenced by contextual realities such as limited digital resources, unstable internet connectivity, and varying levels of institutional support. By centering participants' voices and lived experiences, the study illuminated the personal and professional meanings teachers attached to technology integration within their educational environment.

Literature Comparison

Several studies emphasized that technology integration in classroom instruction was influenced by teachers' pedagogical beliefs, institutional support, and access to digital resources. Existing literature identified challenges such as limited infrastructure, inadequate training, unstable internet connectivity, and insufficient technical support as major barriers to effective technology integration in schools. These findings were supported by studies indicating that teachers often experienced difficulties in maximizing digital tools despite recognizing their potential to enhance student engagement and learning outcomes.

In a broader context, previous research highlighted the importance of professional development programs, collaborative learning environments, and school-based support systems in strengthening teachers' digital competencies and instructional practices. Studies also emphasized that teachers served as key agents in bridging educational policies with classroom realities by adapting instructional strategies according to available technological resources and learners' needs.

Considering these conditions, the present study sought to understand how teachers at Libertad National High School navigated the realities of integrating technology into classroom instruction. By focusing on the specific context of a public secondary school in Butuan City, the research contributed localized and experience-based insights to the broader discourse on educational technology and instructional innovation in the Philippines.

The study was anchored on Social Constructivism and Phenomenology as complementary theoretical lenses. Social Constructivism emphasized that knowledge and meaning were shaped through social interaction and contextual experiences, while Phenomenology focused on understanding the essence of participants' lived experiences. Together, these frameworks enabled the study to examine how teachers interpreted their experiences, adapted instructional practices, and constructed meaning regarding technology integration in classroom instruction.

Data Analysis

In this study, the lived experiences of teachers in integrating technology into classroom instruction were examined through thematic analysis within a phenomenological framework. The researcher systematically analyzed the interview transcripts to identify recurring patterns, shared experiences, and significant insights related to technology integration.

The analysis began with familiarization through repeated reading of the transcripts, followed by the identification of significant statements and initial coding. Similar codes were grouped into categories, which were later synthesized into broader themes representing teachers' perceptions, challenges, adaptation practices, and recommendations. This analytical

process enabled the researcher to capture both common and unique dimensions of participants' experiences while maintaining strong alignment with the research objectives.

Ethical Considerations, Credibility, and Dependability

Ethical considerations were strictly observed throughout the conduct of the study. Informed consent was obtained from all co-participants, ensuring that participation remained voluntary and that participants fully understood the purpose and procedures of the research. Confidentiality and anonymity were maintained by securing all interview recordings, transcripts, and related documents in password-protected and locked storage systems accessible only to the researcher.

Credibility was ensured through member checking, prolonged engagement with the data, and peer debriefing with academic mentors. Dependability was established through the maintenance of an audit trail documenting the procedures undertaken during data collection, coding, and thematic analysis. These measures strengthened the trustworthiness, consistency, and authenticity of the study's findings.

Results and Discussion

Lived Experiences of Teachers in Technology Integration in Classroom Instruction

In this section, five overarching themes were identified from the narratives of teachers regarding their experiences in integrating technology into classroom instruction. These themes illustrate how teachers navigate technological demands, pedagogical decisions, resource constraints, and reflective practices to ensure meaningful learning experiences. The findings are presented in a matrix to show the relationship between formulated meanings, subthemes, and emergent themes, followed by a detailed discussion grounded in relevant literature.

Significant Statements	Sub-themes	Themes
Use of multimedia presentations, visual aids, and digital simulations to explain lessons	Visual instructional support	Contextually Mediated Practice
Use of presentation tools to organize lesson flow and guide students through concepts	Structured digital lesson delivery	Contextually Mediated Practice
Combining digital tools with traditional instruction to facilitate learning discussions	Blended instructional approaches	Contextually Mediated Practice
Preparation of digital materials such as slides, videos, and offline resources to support instruction	Resource preparation	Adaptive and Resilient Instructional Practice
Designing lessons that combine multimedia, diagrams, and tutorials to address diverse learning styles	Multimodal instructional design	Adaptive and Resilient Instructional Practice
Adjusting digital activities and scaffolding tasks to support student understanding	Instructional scaffolding	Adaptive and Resilient Instructional Practice
Using digital simulations, diagrams, and visualizations to simplify abstract concepts	Cognitive scaffolding	Tool for Cognitive Enhancement
Incorporating digital resources such as videos, graphs, infographics, and tutorials to support conceptual understanding	Conceptual accessibility	Tool for Cognitive Enhancement
Utilizing digital tools that allow students to manipulate diagrams and interpret data	Interactive conceptual exploration	Tool for Cognitive Enhancement
Integrating interactive activities and multimedia resources to increase student participation	Motivational stimulation	Engagement-Oriented Pedagogical Strategy
Reflecting on technology-supported lessons to refine teaching strategies	Professional reflexivity	Reflective and Future-Oriented Professional Growth
Aligning digital tools with lesson objectives and instructional goals	Pedagogical alignment	Reflective and Future-Oriented Professional Growth
Integrating digital tools to develop students' digital literacy, creativity, and critical thinking	Future-readiness orientation	Reflective and Future-Oriented Professional Growth

Matrix 1. Teachers' Lived Experiences in Technology Integration

These recurring patterns in teachers lived experiences coalesced into five comprehensive themes:

1. Technology Integration as a Contextually Mediated Practice
2. Technology Integration as an Adaptive and Resilient Instructional Practice
3. Technology Integration as a Tool for Cognitive Enhancement
4. Technology Integration as an Engagement-Oriented Pedagogical Strategy
5. Technology Integration as Reflective and Future-Oriented Professional Growth

Together, these themes capture the multifaceted ways in which teachers at Libertad National High School experience the integration of technology in classroom instruction, highlighting its influence on teaching practices, learning engagement, and professional development.

Technology Integration as a Contextually Mediated Practice

Teachers described technology integration as deeply embedded within their everyday instructional routines rather than as an isolated teaching component. Digital tools were consistently used to organize lesson flow, support explanation of concepts, and facilitate classroom interaction.

Participant 4 emphasized that technology enhances lesson structure, stating that “Technology integration has helped make my lesson delivery more structured and organized. I can prepare step-by-step visual presentations that guide students through the lesson, making it easier for them to follow.”

Similarly, Participant 2 highlighted the complementary use of technology and traditional instruction, explaining that “I combine technology with traditional teaching strategies, using slides and visuals to reinforce discussions. This approach allows me to remain a facilitator while supporting meaningful learning.”

Participant 1 further noted that multimedia tools improve conceptual clarity, sharing that “even simple visual aids and multimedia presentations could make abstract topics clearer and foster greater participation.”

These accounts demonstrate that technology integration is shaped by classroom context and instructional intent, where digital tools are used to support communication, structure lessons, and enhance teacher facilitation rather than replace traditional pedagogy.

The contextualized use of technology reflects the principle that digital tools gain meaning when aligned with pedagogical goals and classroom realities. Arante and Bascon (2025) emphasize that technology must be embedded within instructional systems rather than treated as an independent innovation. Similarly, Gottschalk and Weise (2023) highlight the importance of classroom context in shaping how technology is utilized in teaching.

The experiences of teachers at Libertad National High School demonstrate that technology functions as a pedagogical support tool for organizing lessons and enhancing communication. Rather than replacing teacher-led instruction, it strengthens instructional delivery while maintaining the teacher’s central facilitative role.

Technology Integration as an Adaptive and Resilient Instructional Practice

Teachers described technology integration as a flexible and evolving instructional process requiring creativity, planning, and continuous adjustment to learners’ needs.

Participant 6 explained that “Technology has encouraged me to be more creative in lesson planning. I design instructional materials that appeal to diverse learning styles visual, auditory, and kinesthetic.”

In the same manner, Participant 1 emphasized adaptability in instruction, stating that “I have continuously adjusted my lessons based on students’ responses, and now I feel more confident in planning lessons that use technology purposefully.” Participant 7 added that multimedia resources enhance conceptual understanding, explaining that “I use multimedia resources to clarify concepts and help students make connections between ideas, making lessons more meaningful.”

These narratives illustrate that teachers view technology integration as a dynamic process that requires responsiveness to learner needs and intentional design of multimedia-rich instructional materials.

Adaptive instructional practices are essential in effective technology integration. Awang et al. (2025) emphasize that teachers must demonstrate flexibility in designing and implementing digital learning strategies. Likewise, Bond (2020) highlights that multimodal instructional design enhances inclusivity and responsiveness to diverse learners.

The practices of teachers reflect these principles using varied digital materials such as presentations, videos, and visual organizers. These adaptive strategies demonstrate growing pedagogical competence in integrating technology to enhance instruction.

Technology Integration as a Tool for Cognitive Enhancement

Teachers consistently emphasized that technology supports learners' understanding of complex and abstract concepts through visualization and interactive learning tools.

Participant 1 described using interactive simulations in mathematics, stating that "During a lesson on algebraic functions, I used interactive graphs and digital simulations to show how changing variables affects outcomes. Students were more engaged and could explain the concepts clearly in their own words."

Participant 6 explained the use of manipulatives in geometry, noting that "When teaching geometry, I incorporated interactive diagrams where students could manipulate shapes and explore properties."

Participant 8 further emphasized visualization tools, sharing that "I used interactive maps, infographics, and data visualization tools. Students could interpret information visually and answer analytical questions with greater clarity."

These experiences show that technology enhances cognitive processing by enabling learners to visualize and interact with abstract content.

The cognitive benefits of technology integration are grounded in constructivist learning theory, which emphasizes active knowledge construction (Alam, 2023; Rai, 2025). Digital simulations and visualization tools allow learners to explore relationships among concepts, thereby improving comprehension.

Empirical studies also support these findings, indicating that multimedia tools enhance conceptual understanding and problem-solving skills (Casilao et al., 2025; Jaya & Sucipto, 2023). The experiences of teachers demonstrate that technology acts as a cognitive scaffold that supports deeper understanding and independent learning.

Technology Integration as an Engagement-Oriented Pedagogical Strategy

Teachers highlighted that technology enhances student engagement by promoting interaction, collaboration, and sustained interest in lessons.

Participant 3 explained that "I showed short video clips and interactive timelines. Students were more attentive, asked thoughtful questions, and connected historical context to current society."

Similarly, Participant 5 described collaborative learning activities, stating that "Students used digital research tools, presentation software, and online collaboration platforms. Their output was more detailed and organized."

Participant 7 added that "Using digital storyboards and multimedia annotations made literature discussions more engaging and meaningful."

These narratives indicate that technology fosters active participation and collaborative learning environments.

The engagement-enhancing role of technology aligns with research showing that digital tools increase motivation and participation when used purposefully (Casilao et al., 2025; Jaya & Sucipto, 2023). The TPACK framework further emphasizes that meaningful learning occurs when technology is integrated with content and pedagogy (Fathi & Derakhshan, 2023).

The practices observed among teachers demonstrate that technology enhances engagement when it is strategically aligned with instructional goals.

Technology Integration as Reflective and Future-Oriented Professional Growth

Teachers also described technology integration as a driver of professional reflection and continuous pedagogical development.

Participant 7 reflected that “My experience with technology has been a constant process of trial and adjustment. I carefully select tools that promote reflection and interaction rather than distraction.”

Participant 8 explained that “Technology has become an integral part of my teaching. I use it not only for presenting lessons but also for organizing activities, guiding collaborative projects, and supporting assessments.”

Participant 1 emphasized intentional use, stating that digital tools should enhance understanding rather than serve as mere instructional novelty.

These reflections show that technology integration contributes to teachers’ evolving professional identity and instructional innovation.

Reflective practice plays a crucial role in effective technology integration (Ertmer et al., 2020; Ramnarain et al., 2023). Teachers who reflect on their instructional experiences are more likely to refine and improve their pedagogical strategies. Moreover, the emphasis on digital competence aligns with global educational priorities promoting 21st-century skills such as critical thinking, digital literacy, and adaptability (Razak et al., 2025; Zou et al., 2025). The findings suggest that technology integration supports both instructional improvement and professional growth.

Challenges and Adaptations in Technology Integration

Teachers identified several challenges in integrating technology into instruction, particularly in managing diverse learner abilities, aligning digital tools with pedagogy, and addressing resource limitations.

Participant 2 noted that students’ progress at different speeds when using digital tools, requiring careful classroom management and monitoring to ensure engagement.

Participant 5 emphasized variation in digital literacy, stating that “some students were confident and familiar with technology, while others struggled with basic operations,” requiring scaffolding and guided instruction.

Participant 4 observed that in simulation-based mathematics lessons, some students focused on obtaining answers quickly rather than engaging in analytical thinking.

Participant 3 similarly noted that multimedia presentations sometimes shifted attention away from deeper discussion toward visual content.

Participants also highlighted infrastructure limitations. Participant 1 explained that the absence of functional equipment requires lesson modification, while Participant 4 noted challenges due to limited device availability.

Despite these constraints, teachers adopted adaptive strategies. These included breaking tasks into smaller steps, combining digital and traditional instruction, peer pairing, and rotating device use to maximize participation.

Participant 8 emphasized the importance of reflection in improving instructional strategies and ensuring effective technology integration.

Formulated Meanings

The analysis of participants’ narratives revealed five key meanings:

1. Teachers encounter instructional management challenges due to varying levels of digital literacy among students, requiring scaffolding and differentiated support.
2. Technology must be carefully guided to ensure it supports critical thinking and deep learning rather than surface-level engagement.
3. Institutional and resource constraints significantly influence the effectiveness of technology integration.
4. Teachers employ adaptive strategies such as scaffolding, collaboration, and blended instruction to address classroom challenges.
5. Reflective practice is essential for continuous improvement in technology-enhanced instruction.

Challenges and Adaptation Practices in Technology Integration

The analysis of teachers’ experiences regarding the challenges and adaptations associated with technology integration resulted in five overarching themes:

1. Technology Integration as an Instructionally Complex Process
2. Technology Integration as a Pedagogical Balancing Act
3. Technology Integration as a Resource-Influenced Practice
4. Technology Integration as an Adaptive Instructional Strategy
5. Technology Integration as Reflective Professional Practice

These themes illustrate how teachers navigate technological, pedagogical, and institutional conditions while actively adapting their instructional practices to support effective technology integration.

Significant Statements	Sub-themes	Themes
Students' progress at different speeds when using digital tools	Instructional considerations	Instructionally Complex Process
Differences in students' digital familiarity	Digital readiness diversity	
Students focus on digital output rather than deeper analysis	Guided use of digital tools	Pedagogical Balancing Act
Need to ensure technology supports critical thinking	Pedagogical alignment	
Limited availability of devices and equipment	Resource accessibility	Resource-Influenced Practice
Shared devices requiring structured activities	Infrastructure considerations	
Breaking tasks into smaller steps	Instructional scaffolding	Adaptive Instructional Strategy
Pairing students for peer Support	Collaborative learning	
Rotating device use and adjusting pacing	Flexible instructional Management	Reflective Professional Practice
Reflecting on lesson outcomes	Reflective teaching practice	

Matrix 2. Challenges and Adaptation Practices in Technology Integration

Technology Integration as an Instructionally Complex Process

Teachers described technology integration as requiring careful instructional planning and classroom Management. Differences in students' familiarity with digital tools and the pace at which they navigate technological activities require teachers to monitor student progress closely and provide guidance when needed.

Technology-rich learning environments often require teachers to manage both instructional and technological aspects of classroom activities simultaneously. Research indicates that integrating digital tools introduces additional layers of instructional complexity, particularly when students demonstrate varying levels of digital literacy (Bećirović, 2023; Lituañas & Fernal, 2025). Teachers must therefore design structured digital activities and provide appropriate scaffolding to ensure that technology supports equitable participation and effective learning.

Technology Integration as a Pedagogical Balancing Act

Participants emphasized that technology must be carefully aligned with instructional goals to maintain meaningful learning interactions. Teachers observed that digital presentations or simulations can sometimes draw attention to visual outputs rather than to conceptual understanding if not appropriately guided.

Constructivist learning theory suggests that meaningful learning occurs when students actively engage in knowledge construction through interaction, reflection, and inquiry (Alam, 2023; Rai, 2025). Technology, therefore, becomes most effective when integrated within pedagogical strategies that promote analysis, dialogue, and critical thinking. Within the TPACK framework, teachers must balance technological tools with pedagogical knowledge and subject content to create meaningful learning experiences (Fathi & Derakhshan, 2023).

Technology Integration as a Resource-Influenced Practice

Teachers noted that access to technological resources influences how they incorporate digital tools into classroom instruction. Limited device availability or shared equipment requires teachers to design instructional strategies that make use of existing resources.

The role of technological infrastructure in supporting digital instruction is widely documented in educational research. Adequate ICT resources enable teachers to implement interactive and collaborative learning activities effectively (Arante & Bascon, 2025). In many educational contexts, variations in infrastructure continue to influence the consistency with

which technology can be integrated into classroom instruction (Espinosa et al., 2023). These findings highlight the importance of institutional Support in sustaining effective technology-enhanced learning environments.

Technology Integration as an Adaptive Instructional Strategy

Teachers described various strategies for adapting to challenges encountered when integrating technology into their lessons. These strategies included scaffolding digital tasks, encouraging peer collaboration, simplifying digital activities, and adjusting lesson pacing to accommodate different levels of digital familiarity.

Adaptive teaching practices play a crucial role in ensuring the effectiveness of technology integration. Teachers who demonstrate instructional flexibility are better able to respond to diverse classroom contexts and technological conditions (Awang et al., 2025). Collaborative learning strategies, such as peer assistance, also help strengthen students' digital literacy and engagement with technology-supported learning activities (Razak et al., 2025).

Technology Integration as Reflective Professional Practice

Teachers emphasized that integrating technology requires continuous reflection and evaluation of instructional strategies. Reflective practice enables teachers to assess the effectiveness of digital tools and identify ways to improve technology-supported learning experiences.

Reflective teaching is a key component of sustainable technology integration. Teachers' beliefs, experiences, and reflective practices significantly influence how they use digital tools to Support learning (Ertmer et al., 2020). Through ongoing reflection and professional learning, teachers develop stronger technological pedagogical competencies and refine their instructional approaches to meet evolving educational demands (Amemasor et al., 2025).

What themes emerged based on the formulated meanings?

The analysis of teachers' narratives regarding their experiences, challenges, and adaptation practices in integrating technology into classroom instruction revealed several recurring patterns that describe how educators meaningfully incorporate digital tools into their teaching practices. Through iterative reading, coding, and interpretative reflection, the formulated meanings from the previous analyses were synthesized to identify the broader structures of teachers' lived experiences with technology integration.

The synthesis indicates that technology integration is not merely the use of digital tools, but a dynamic pedagogical process shaped by instructional context, student learning needs, institutional conditions, and teachers' reflective professional practice. Teachers described integrating digital tools to enhance lesson delivery, clarify complex concepts, and promote student engagement. At the same time, they encountered technological and instructional conditions that required thoughtful planning, adaptation, and reflection to ensure that technology supported meaningful learning.

From these interconnected experiences and adaptation practices, five overarching themes emerged:

1. Technology Integration as a Contextually Situated Pedagogical Practice
2. Technology Integration as a Dynamic and Adaptive Teaching Process
3. Technology Integration as a Catalyst for Cognitive Development and Student Engagement
4. Technology Integration as a Resource-Influenced Educational Practice
5. Technology Integration as Reflective and Transformative Professional Practice

Together, these themes capture the multifaceted ways in which teachers at Libertad National High School experience technology integration as an evolving pedagogical practice that supports both teaching effectiveness and student learning outcomes.

Technology Integration as a Contextually Situated Pedagogical Practice

Teachers' experiences revealed that technology integration is closely connected to the instructional context in which teaching occurs. Rather than treating technology as a separate instructional component, teachers integrate digital tools within their everyday classroom routines to Support lesson delivery, facilitate discussions, and clarify complex concepts. Participants described using multimedia presentations, visual aids, and digital resources to structure lessons and guide students through instructional activities.

Emergent themes emerge from this matrix, showing the main patterns in how teachers integrate technology into instruction. It shows that digital tools are used to organize lessons and support classroom communication and are consistently embedded in everyday teaching practices. Teachers also adjust their use of technology based on learner needs and classroom conditions. In addition, technology enhances students' understanding and engagement through multimedia and interactive resources. The findings further indicate that access to resources and institutional support influence how technology is implemented. Overall, teachers engage in continuous reflection and improvement in their use of technology, contributing to their professional growth.

Formulated Meanings	Subthemes	Emergent Themes
Digital tools Support lesson organization and classroom communication	Instructional structuring	Contextually Situated Pedagogical Practice
Technology is embedded within daily instructional routines	Contextual instructional use	
Teachers adjust their use of technology to address student needs and classroom conditions.	Instructional flexibility	Dynamic and Adaptive Teaching Process
Digital activities are scaffolded and combined with traditional teaching approaches.	Adaptive pedagogy	
Multimedia resources help students understand abstract concepts	Cognitive scaffolding	Catalyst for Cognitive Development and Student Engagement
Interactive digital tools encourage participation and collaboration	Engagement-oriented learning	
Access to devices and technological infrastructure influences instructional design.	Resource accessibility	Resource-Influenced Educational Practice
Institutional conditions shape technology implementation	Institutional context	
Teachers evaluate lessons and refine technology-supported instruction	Reflective teaching practice	Reflective and Transformative Professional Practice
Continuous experimentation with digital tools contributes to professional growth	Professional learning	

Matrix 3. Emergent Themes Based on Formulated Meanings

These experiences demonstrate that teachers select technological tools based on instructional objectives and classroom needs rather than adopting technology solely for novelty's sake. Technology, therefore, becomes embedded within pedagogical practices that Support effective communication of knowledge and facilitate student understanding.

The contextual nature of technology integration reflects the principle that digital tools become meaningful only when aligned with pedagogical goals and instructional environments. Research indicates that technology integration is most effective when embedded within existing teaching practices rather than being treated as an independent innovation (Law et al., 2021). Similarly, studies on technology adoption emphasize that teachers' instructional contexts and classroom dynamics significantly shape how digital tools are implemented in learning environments (Utaminingsih et al., 2023). These findings Support the view that technology integration is fundamentally a contextual pedagogical practice shaped by the interactions among teachers, learners, and instructional settings.

Technology Integration as a Dynamic and Adaptive Teaching Process

Teachers' narratives highlighted the adaptive nature of technology integration. Participants described adjusting instructional strategies, lesson pacing, and digital activities in response to students' learning needs and technological conditions within the classroom. Teachers frequently modified digital tasks provided step-by-step guidance, and combined digital tools with traditional teaching methods to ensure that technology effectively supported student learning.

These adaptation practices demonstrate that technology integration is not a fixed instructional approach but a flexible teaching process that evolves as teachers respond to classroom situations and student learning requirements.

Adaptive teaching practices are widely recognized as essential for successful technology integration. Educational research suggests that teachers must continuously adjust instructional strategies to address technological constraints and diverse student abilities (Awang et al., 2025). The adaptive practices described by participants also reflect the principles of student-

centered learning, in which teaching strategies evolve in response to learners' needs and experiences (Alam, 2023). Through these adaptive strategies, teachers ensure that technology functions as a supportive learning tool rather than an obstacle to effective instruction.

Technology Integration as a Catalyst for Cognitive Development and Student Engagement

Teachers consistently described technology as supporting students' conceptual understanding and classroom engagement. Digital tools such as simulations, visualizations, and multimedia resources allow students to explore concepts interactively and observe relationships between ideas. Participants noted that these tools help clarify abstract topics and encourage students to participate more actively in classroom discussions and collaborative learning activities. These experiences indicate that technology can serve as both a cognitive Support system and a motivational tool, encouraging active student participation in the learning process.

The cognitive benefits of technology integration align with constructivist learning theory, which emphasizes active knowledge construction through exploration and interaction (Rai, 2025). Digital simulations and multimedia visualizations enable students to manipulate information and observe conceptual relationships, strengthening comprehension of complex ideas. Empirical studies also indicate that interactive digital tools enhance student engagement and academic participation in technology-supported learning environments (Casilao et al., 2025; Jaya & Sucipto, 2023). When used strategically, technology therefore supports both conceptual understanding and meaningful classroom engagement.

Technology Integration as a Resource-Influenced Educational Practice

Participants also emphasized that the successful implementation of technology integration is influenced by institutional conditions such as access to digital devices, availability of classroom equipment, and technological infrastructure. Teachers described designing lessons that make use of existing resources while ensuring students remain actively engaged in learning activities.

These experiences indicate that technology integration is shaped not only by pedagogical strategies but also by the broader institutional environment in which teaching occurs.

Analysis and Interpretation

The influence of technological resources on instructional practices has been widely documented in educational research. Adequate ICT infrastructure is essential for sustaining effective digital learning environments and enabling teachers to implement interactive instructional activities (Arante & Bascon, 2025). Studies examining technology integration in Philippine education also highlight how variations in technological resources influence the consistency and depth of digital instruction across schools (Espinosa et al., 2023). These findings demonstrate that institutional Support and technological infrastructure are critical components of successful technology integration.

Technology Integration as Reflective and Transformative Professional Practice

Teachers' experiences further revealed that integrating technology encourages reflective teaching and professional growth. Participants described evaluating the effectiveness of digital tools, reflecting on student learning outcomes, and modifying instructional strategies to improve future lessons. Through this process of reflection and experimentation, teachers gradually develop more effective approaches to integrating technology into their teaching practices.

Technology integration, therefore, contributes not only to classroom instruction but also to teachers' ongoing professional development and instructional innovation.

Reflective practice plays a crucial role in teachers' professional learning and technology integration. Research indicates that teachers' beliefs, experiences, and reflective practices significantly influence how they use digital tools to Support instruction (Ertmer et al., 2020). Continuous reflection also contributes to the development of technological pedagogical content knowledge (TPACK), which integrates technological tools with pedagogical strategies and subject knowledge (Fathi & Derakhshan, 2023). Through reflective practice, teachers refine their instructional approaches and strengthen their ability to integrate technology to Support meaningful student learning.

Proposed program that would Support teachers in effectively integrating technology into classroom instruction

Based on the findings of this phenomenological study, a localized project proposal is developed herein to address the identified needs and challenges in technology integration among teachers at Libertad National High School. The results revealed that technology integration is a contextually mediated and adaptive instructional process shaped by

infrastructural constraints, lack of resources and materials, inconsistent internet connectivity, and variability in students' digital readiness. Teachers demonstrated the capacity to employ adaptive strategies, including scaffolding, blended instructional approaches, peer collaboration, and multimedia resources; however, these practices were largely individualized and lacked Support from a structured or systematic program.

Considering these findings, the proposed Technology Integration Enhancement Program is designed to provide a coherent, context-responsive, and sustainable intervention framework. The program directly responds to the identified challenges by strengthening teachers' adaptive practices and addressing gaps in resources, instructional Support, and professional development. It integrates capacity-building, collaborative professional learning, and reflective practice to enhance teachers' technological, pedagogical, and content knowledge (TPACK). It further aims to strengthen alignment between technology use and instructional objectives, promote adaptive and inclusive teaching strategies, and Support continuous professional growth.

Through this initiative, the study operationalizes its findings into a practical, evidence-based program that clearly connects identified challenges to proposed solutions, ensuring that technology integration becomes more structured, sustainable, and effective within the school context.

Conclusion and Recommendations

Conclusion

Based on the significant findings of the study, the following conclusions were drawn:

Teachers integrate technology into classroom instruction as a contextually mediated practice that enhances lesson delivery, supports conceptual understanding, and promotes student engagement.

Technology integration is influenced by challenges such as limited resources and materials, inconsistent internet connectivity, and variations in students' digital readiness; however, teachers demonstrate adaptive and resilient practices to address these constraints.

Technology integration is a dynamic and context-dependent process characterized by adaptive instructional strategies, engagement-oriented practices, and reflective professional growth, all of which contribute to meaningful learning experiences.

A structured, context-based Technology Integration Enhancement Program is necessary to Support teachers by addressing identified challenges and strengthening their adaptation practices, ensuring sustainable and effective technology integration.

Implications

Teachers' Lived Experiences in Integrating Technology

Teachers experienced technology integration as a contextually mediated practice that supports instructional delivery, enhances conceptual understanding, and promotes student engagement through multimedia tools and interactive resources.

Challenges and Adaptations in Technology Integration

Teachers encountered challenges such as limited resources and materials, inconsistent internet connectivity, and varying levels of students' digital readiness. In response, they employed adaptation practices including scaffolding, blended instructional approaches, peer collaboration, and flexible lesson design.

Emergent Higher-Order Themes

The study revealed that technology integration is a contextually situated, adaptive, and reflective instructional process that supports cognitive development, student engagement, and professional growth while being influenced by available resources and institutional conditions.

Proposed Technology Integration Support Program

Based on the findings, a context-based Technology Integration Enhancement Program was developed to address identified challenges and strengthen teachers' adaptation practices through structured training, collaboration, and reflective learning.

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Competing Interests Statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this article.

Data Availability Statement

Data sharing is not applicable to this article as no new data were created or analyzed in this study; all data used were obtained from previously published sources as cited in the reference list.

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Appendices

No appendices are attached to this study.