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## Struggles and Successes of School Administrators in Implementing Technology Management in Operations

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### Abstract

The study explores the struggles and successes of school administrators in implementing technology management in school operations within the Valencia City Division. Utilizing a qualitative narrative analysis approach, the experiences of ten public school administrators were examined to understand capacity-building engagements, challenges faced, effective strategies, and recommendations for sustainable technology integration. Findings reveal that administrators participate in diverse trainings focusing on digital records management, ICT troubleshooting, and the use of platforms like DepEd LMS and Google Workspace, which enhance digital competence and operational efficiency. Despite notable successes such as improved data processing, communication, and collaboration, administrators face significant challenges including unstable internet connectivity, limited ICT equipment, human resource resistance, and inadequate technical support. These challenges highlight the dual infrastructural and human resource barriers that affect seamless technology adoption. Key strategies for success emphasize systematic and sustainable implementation through clear ICT planning, continuous capacity building, resource optimization, and collaborative leadership. The study underscores that effective technology management goes beyond technical acquisition; it requires holistic approaches encompassing planning, mentoring, and policy alignment to foster a resilient digital ecosystem in schools. The findings contribute to the growing body of knowledge on digital transformation in education by offering evidence-based recommendations to enhance administrative capacity and overcome common obstacles in Philippine educational settings. This research reinforces the critical role of school leadership in driving technology integration to improve governance and instructional outcomes.

**Keywords:** Technology management, School administrators, Digital transformation, Capacity building, ICT integration, Educational leadership, Operational efficiency

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### 1. Introduction

School administrators are at the forefront of integrating technology management within the daily operations of educational institutions. In today's fast-paced and increasingly digital world, their role is critical in shaping not only the instructional landscape, but also the broader operational efficiency and effectiveness of schools. The changing dynamics in Philippine education, driven by digital transformation, ambitious reforms, and global trends, make technology management a central pillar in school governance. However, school leaders commonly encounter a range of challenges and opportunities as they seek to embed digital

systems into school processes, support teachers, and respond to the evolving demands of learners and communities.

Across Philippine schools, administrators have witnessed a significant increase in training related to technology management. These trainings center on key areas such as digital records management, troubleshooting information and communications technology (ICT) equipment, data privacy, electronic filing systems, and the effective deployment of platforms like the DepEd Learning Management System and DepEd Commons. The intent of such capacity-building programs is clear: enable administrators to acquire practical skills and a deeper understanding of how digital tools can mediate governance, record keeping, and communication. Hands-on sessions in Google Workspace for Education and regional webinars on ICT planning have dramatically improved digital competency among school heads. As more schools transition to blended and online learning, administrators have been tasked to lead electronic scheduling, participate in webinars on cybersecurity awareness, and conduct capacity-building activities focused on online improvement plan preparation.

The value of these professional development programs cannot be overstated. Studies in the Philippines affirm that such training opportunities lay the foundation for successful technology management. For instance, Nicolas and Santos (2024) highlight the positive impact of regular training on administrators' attitudes and confidence despite ongoing infrastructure challenges, showing that professional development is not merely about technical expertise but also about fostering a mindset open to digital change. The Development Academy of the Philippines (2025) likewise underscores that robust data governance and digital management training are fundamental for innovative school leaders. Moreover, national directives emphasize ongoing teacher and administrator training in ICT as a core component of educational standards (Education Profiles, 2025; TESDA, 2019).

International research supports these local findings. UNESCO (2023) stresses the benefits of open educational resources and flexible online courses, noting how such models enhance educator readiness for digital integration. The ITCILO's Master's program in development management combines policy understanding and ICT skills to strengthen leadership in digital transformation, further supporting the need for holistic capacity-building approaches.

Human resource issues present a parallel challenge. Administrators report resistance from some teachers, particularly those unfamiliar or uncomfortable with digital tools. Overcoming these barriers extends beyond basic training and requires sustained mentoring, staff development programs, and efforts to align technology initiatives with existing school policies. In some schools, older staff members struggle to adapt to new systems, while the lack of dedicated technical support makes maintenance and system updates inconsistent.

The duality of challenges—spanning both infrastructure and human resources—finds strong confirmation in related literature. Acebuche (2023) notes that digital leadership in Philippine schools is shaped by limitations in infrastructure and gaps in ICT competencies among school staff, urging for comprehensive capacity-building strategies and sustained funding. Another local study published in 2025 identified recurrent issues such as inequitable access to technology, underdeveloped ICT skills, and insufficient maintenance, all of which limit the effectiveness of administrative support.

International perspectives mirror these complexities. Kyereh, Addai-Amoah, and Owusu-Addo (2023) discuss how management practices in Ghanaian senior high schools, much like in the Philippines, are impeded by infrastructure shortfalls and insufficient staff development. Livkovic and Rojko (2022) highlight universal challenges including resistance to change, digital literacy gaps, and financial constraints. Heim (2021) argues that sustainable technology management requires not only investment in systems and equipment but also continuous professional development.

## **2. Theoretical Framework**

This study is anchored on the Capacity Building and Digital Transformation theory, which posits that successful technology management in school operations hinges upon developing educators' technological competencies, fostering positive attitudes towards change, and overcoming infrastructural and resource limitations. School administrators' real-life accounts highlight training in digital records management, ICT planning, and online platforms as key drivers of technology adoption. However, their actions are shaped by access to equipment, stable internet, and ongoing professional development. The interplay between human resource readiness and systemic support frameworks determines both the struggles and successes in technology integration. By grounding operational transformation in targeted capacity-building initiatives, clear ICT strategic plans, and adaptive leadership, administrators navigate challenges and achieve improved efficiency. This framework recognizes that success arises not only from technological acquisition but from holistic, sustainable approaches—planning, collaboration, and inclusiveness—in building resilient digital education ecosystems. Effective technology management thus reflects a balance between overcoming barriers and enabling continuous growth in school operations.

## **3. Statement of the Problem**

This study aims to explore the struggles and success of school administrators in implementing technology management in school operations. Specifically, it seeks to answer the following questions:

1. What types of capacity-building activities or trainings have school administrators undergone related to technology management implementation?
2. What struggles do school administrators encounter in implementing technology management in school operations?
3. How do school administrators describe their successes in implementing technology management in school operations?
4. What strategies and practices contribute to the effective and sustainable implementation of technology management in schools?
5. What recommendations can be drawn from the lived experiences of school administrators to strengthen technology management in educational operations?

## **4. Review of Related Literature**

The integration of technology in school operations has become an essential component of educational leadership and management, particularly in the last decade. Across various studies, school administrators play a central role in shaping how technology is adopted, utilized, and sustained within their institutions. In the Philippine context, Nicolas and Santos (2024) revealed that administrators generally have positive attitudes toward ICT adoption, recognizing

its potential to enhance school operations and instructional quality. However, their study also pointed out persistent challenges such as insufficient ICT infrastructure, unstable internet connectivity, and limited technical support. Similarly, Acebuche (2023) emphasized that digital leadership among school heads is crucial in promoting effective technology use. His review highlighted that administrators must possess not only technological knowledge but also visionary leadership to foster a culture of innovation and continuous learning. Meanwhile, national analyses such as the World Bank's Digital Transformation of Philippine Higher Education (2022) reported that without sufficient investment in broadband infrastructure and professional development, digital transformation efforts risk stagnation. Local case studies further echoed these findings, underscoring the difficulties administrators face in balancing infrastructure needs, personnel training, and maintenance amid budget limitations.

At the international level, UNESCO's Global Education Monitoring Report 2023: Technology in Education underscored that technology can enhance efficiency and access when implemented strategically, but may widen gaps when resources and competencies are unequal. Timotheou et al. (2022) likewise found that successful technology management in schools depends on strong leadership, adequate resources, and continuous capacity building. Schmitz et al. (2023) demonstrated that transformational leadership significantly predicts teachers' willingness and ability to integrate digital tools into instruction, suggesting that the behavior and vision of school administrators are vital in shaping institutional technology culture. Complementary frameworks such as the European Commission's DigComp (Vuorikari et al., 2017–2022) further provided structured competencies to guide administrators in assessing readiness and planning professional development. These international perspectives parallel the experiences of Filipino school heads, who, despite limitations, strive to use technology to improve efficiency in school operations. The responses in the researcher's data support these themes administrators reported that digital systems enhanced record-keeping, report submission, and communication, though they struggled with limited equipment, unreliable connections, and resistance to change.

Both local and international studies converge on the idea that technology management in schools requires more than the mere provision of devices or systems. It demands strategic leadership, continuous training, sustainable funding, and shared accountability among stakeholders. While administrators have made significant strides in improving operations through technology, their struggles rooted in infrastructure, policy, and human factors continue to shape the pace and depth of digital transformation. These findings affirm that success in technology management is not only technical but deeply organizational and relational, requiring persistent efforts in leadership development, resource allocation, and collaborative innovation.

In the Philippine setting, several studies have investigated the readiness and competencies of educational leaders in adopting and sustaining technology-based operations. Nicolas and Santos (2024) emphasized that Filipino school administrators recognize technology as an essential component of effective governance, particularly in streamlining administrative tasks and enhancing efficiency. Their study revealed, however, that barriers such as inadequate ICT infrastructure, insufficient technical personnel, and unstable internet connectivity continue to hinder full implementation. Similarly, Acebuche (2023) examined the concept of digital leadership and concluded that administrators who adopt proactive and transformational leadership styles are better able to integrate technology into their school systems. This

leadership approach fosters collaboration, continuous learning, and a shared vision for digital innovation among teachers and staff. Furthermore, the World Bank's (2022) national report on the Digital Transformation of Philippine Higher Education which also applies to basic education contexts, highlighted the importance of government support in expanding broadband infrastructure and developing digital skills. Without sustainable investments and targeted training programs, schools risk widening digital gaps between well-resourced and rural institutions.

Other Philippine-based studies strengthen these findings. Local research from various divisions and regions, such as those summarized by the Department of Education (DepEd) and independent action studies, point to recurring issues of limited funding, outdated devices, and inconsistent ICT policies. Teachers and administrators alike report difficulties in maintaining computer laboratories, integrating learning management systems (LMS), and ensuring data privacy compliance. Despite these challenges, many schools have achieved notable successes through initiatives like the DepEd Learning Management System, Google Workspace adoption, and electronic School Improvement Plans (e-SIP). These efforts demonstrate how committed school heads can leverage limited resources to enhance communication, streamline reporting, and improve data accuracy in decision-making. Such local experiences echo the findings in your qualitative data, where administrators recount similar struggles but also cite tangible improvements in efficiency and collaboration once systems are operational.

## **5. Methodology**

### **Objectives:**

To explore the experiences of school administrators concerning the implementation and management of technology in school operations, to identify effective strategies and provide recommendations for improvement.

1. To determine the types of capacity-building activities or training school administrators have undergone related to technology management implementation.
2. To identify the struggles encountered by school administrators in implementing technology management in school operations.
3. To describe the successes articulated by school administrators in implementing technology management in school operations.
4. To ascertain the strategies and practices that contribute to the effective and sustainable implementation of technology management in schools.
5. To formulate recommendations based on the lived experiences of school administrators to strengthen technology management in educational operations.

### **Research Design:**

A qualitative research design was employed to explore the Struggles and Successes of School Administrators in Implementing Technology Management in the Operations of the school administrators of Valencia City Division. This design allowed for an in-depth understanding of the experiences and perspectives of the participants. The study adopted a Narrative Analysis approach, which involved immersing the researcher in the school to gain a comprehensive understanding of their stories and experiences.

### **Locale of the Study**

The data were collected in the Schools Division of Valencia, Valencia City, Bukidnon, Philippines.

#### Respondents of the Study

Purposive sampling was utilized to select participants who were school administrators in public school elementary and secondary. Specifically, Ten (10) school leaders were included in the sample. The determination of the sample size was guided by the principle of data saturation, ensuring that data collection continued until no new information or themes emerged.

#### Research Instrumentation

A careful selection of research equipment was needed to determine the struggles and successes of school administrators in implementing technology management in operations. Through a questionnaire carefully validated by experts, interviews, observation, and precise content analysis of school documents and technology-use logs were achieved. These research tools provided a deep and detailed analysis of the topic as well as unique perspectives from individual experiences of the School Administrators. This research illuminated the complex relationship between administrative practices and the effective integration or management challenges of technology within school operations. Qualitative methods illuminated this association in this study.

#### Data Gathering Procedure

The data was collected using a standardized questionnaire that participants (School Administrators) were given time to complete. Proper protocol, including securing permission from the Superintendent or Division Office and the respective school heads, was observed. We notified the participants about the confidentiality and anonymity of the data acquired, emphasizing that their responses would be used solely for research purposes.

#### Ethical Considerations in the Data Collection:

This inquiry strictly adhered to the ethical principles of research. Prior to the collection of data, a formal letter request was submitted to the Division Superintendent and the School Principal(s) stating the purpose of the study and requesting permission to conduct the survey and interviews with the School Administrators involved in technology management. Informed consent was secured from all participants, assuring them of their right to withdraw at any time and protecting the privacy of their responses.

#### Data Analysis

In the analysis, the qualitative data gathered from the open-ended questions and interviews were treated using Thematic Analysis to identify recurring patterns, challenges, and successful strategies, as reflected in the presentation of results and explained in the interpretations. The quantitative data from the closed-ended questions (e.g., success rating scales) were analyzed using descriptive statistics (e.g., frequencies, means, standard deviations) to provide a clear summary of the extent of struggles and successes.

## 6. Results and Discussion

This section presents the analyses and interpretation of data obtained from the participants of the study. The information is presented in themes with interpretation and implication. The presentation is organized based on the order of the research questions:

1. Type of training received in terms of technology management implementation

Emerging Themes:

Capacity building through diverse technology management trainings focused on digital tools, data management, and online platforms for school operations

Supporting combined responses under this theme:

School administrators have participated in various training sessions aimed at enhancing their skills in technology management for school operations. These include sessions on digital records management, basic ICT troubleshooting, and the use of education-specific platforms such as the DepEd Learning Management System and DepEd Commons. They were also trained on tools for electronic filing systems, Google Workspace for Education, and cybersecurity awareness to ensure safe and efficient handling of school data.

Further training involved practical and hands-on learning in electronic scheduling, data privacy, digital transformation, and the preparation and monitoring of electronic School Improvement Plans (e-SIP). Capacity-building efforts also covered ICT planning, school systems management, and the use of blended learning modalities to strengthen administrators' competence in integrating technology into governance and operations.

Theme Analysis and Discussion:

The theme of capacity building through diverse technology management trainings focused on digital tools, data management, and online platforms is evident in the responses provided by school administrators. The administrators received training that encompasses practical skills such as digital records management, ICT troubleshooting, usage of the DepEd Learning Management System, Google Workspace for Education, cybersecurity, and electronic financial reporting. These focused capacity-building sessions enable administrators to manage data, enhance school operations, and implement digital platforms effectively, as demonstrated by the repeated mentions of e-SIP preparation, online monitoring, and blended learning approaches.

This thematic trend aligns with findings from Philippine studies like Nicolas and Santos (2024), who emphasize strategic planning, infrastructure readiness, and professional development as key factors enabling administrators to drive instructional advancement through technology. Their study specifically notes how training enhances administrators' positive attitude and capability despite infrastructure challenges, supporting the critical role of diverse capacity-building programs. Similarly, the Development Academy of the Philippines (2025) underscores the importance of data governance and digital transformation training as foundational for local government innovation, a principle applicable in school administration contexts.

Internationally, studies on technology integration stress sustainable training models that prepare educational leaders and staff for seamless adoption of ICT tools. For instance, UNESCO (2023) discusses the impacts of open educational resources and flexible online courses on educator preparedness, resonating with the administrators' engagement in MOOCs

and blended sessions. Further, the ITCILO Master in Management of Development (2025) highlights the necessity of multi-disciplinary approaches combining policy understanding with ICT skills for effective digital transformation leadership.

**Comprehensive implication:** The consistent engagement in targeted technology management trainings empowers school administrators to meet operational demands through digital solutions, fostering improved governance and instructional support. Capacity building through such initiatives is essential not only for skill acquisition but also for embedding technology use into everyday school processes, thus enhancing responsiveness, data-driven decision-making, and the overall quality of education management. This implies that policy frameworks and school leadership development programs must sustain and expand access to specialized, relevant technology training that reflects the evolving digital education landscape.

## 2. Struggles encountered in implementing technology management in school operations

Emerging Themes:

### Infrastructural and Human Resource Challenges in Implementing Technology Management

Supporting combined responses under this theme:

School administrators commonly faced infrastructural and human resource barriers in implementing technology management in operations. They shared that unstable internet connection and frequent power interruptions (R1, R3) disrupted the continuity of online-related tasks. Many noted the insufficiency of ICT equipment and limited funds for purchasing needed hardware such as computers and printers (R1, R4). Adding to this material constraints were human resource concerns, where some teachers showed resistance or lack of confidence in using digital tools (R2, R5, R9). The absence of technical personnel for equipment maintenance (R7) and challenges in aligning technology initiatives with existing school policies (R6) further complicated implementation. A few also raised system maintenance and data security issues (R8, R10), reflecting the complexity of sustaining technological innovations beyond initial deployment.

Theme Analysis and Discussion:

The responses to the question on struggles encountered in implementing technology management in school operations strongly highlight the dual issues of infrastructure and human resource capacity. Administrators notably cited insufficient internet connectivity and ICT equipment, unreliable power supply, and the inadequacy of funds for purchasing technological resources as core infrastructural concerns. For instance, responses mention "lack of stable internet connection," "insufficient ICT equipment," and "limited funds for purchasing computers and printers" as frequent obstacles in day-to-day operations. Simultaneously, human resource challenges such as teacher resistance, lack of confidence or motivation to use digital tools, and the absence of technical support staff further compounded these infrastructural problems. Several responses pointed to "teacher resistance due to lack of confidence," "preference for manual systems," and "lack of technical personnel to maintain equipment." These statements reflect not only a need for material resources but also for ongoing staff development and technical support, showing how deeply intertwined both dimensions are in the practical implementation of technology management.

Aligned with these findings, the administrators' experiences offer clear insights into the complexity of driving technology management in school operations. Technical glitches, inconsistent systems, and difficulties in aligning new technology initiatives with existing policies were additional layers of struggle. Others discussed the challenge of ensuring data privacy and the burden posed by the lack of regular maintenance support, further illustrating the dependence on both reliable infrastructure and competent human resources to sustain any digital initiative. Collectively, these real-world accounts present a comprehensive picture that effective technology management is not possible without addressing both the physical (equipment, connectivity, technical support) and human (training, acceptance, alignment with policy) barriers.

### 3. Success of implementing technology management in the school operations

Emerging Themes:

#### Enhanced Operational Efficiency through Digital Transformation

Supporting combined responses under this theme:

School administrators commonly described the success of implementing technology management as the achievement of greater efficiency and organization in school operations. They emphasized that digital systems have led to faster data processing, real-time access to records, and improved communication among stakeholders. The automation of previously manual tasks has streamlined workflows such as document tracking and reporting, resulting in quicker turnaround times and more accurate information management.

Moreover, the integration of technology fostered better coordination and collaboration across departments, promoting transparency and resource sharing among teachers and staff. As one administrator noted, the success is both gradual and meaningful, reflecting a continuous transformation from traditional to digital operations that sustains improved school management performance.

Theme Analysis and Discussion:

The theme "Enhanced Operational Efficiency through Digital Transformation" clearly characterizes the success perceived by school administrators in implementing technology management within school operations. The survey responses consistently point to digital solutions improving routine administrative functions and daily processes. For instance, several administrators noted visible improvements in data processing speed and communication transparency (R1, R4). Others specifically cited teachers' more active use of digital tools for reporting and monitoring (R2), as well as improved coordination and collaboration across departments (R3, R7). Respondents also observed a transformation from manual to automated systems, making document tracking faster and more accurate (R5, R6), and described a more organized and secure reporting system (R8). The ability to generate real-time records and streamline resource sharing further highlights the operational advantages conferred by technology (R10, R7). These responses provide direct evidence that digital transformation enhances efficiency, allowing schools to allocate their resources more strategically and respond more rapidly to the needs of students and stakeholders.

### 4. Recommendation to other school administrators who want to implement technology management in school operations

### Emerging Themes:

#### Strategic and Sustainable Implementation of Technology Management through Planning, Capacity Building, and Resource Optimization

Supporting combined responses under this theme:

School administrators emphasized the importance of a systematic and sustainable approach when introducing technology in school operations. They recommended starting with manageable initiatives such as digitizing school records (R1) and gradually expanding to broader systems once staff are prepared and the infrastructure is stable (R3).

Several respondents underscored the value of continuous mentoring, peer learning, and inclusivity in training to ensure that all staff particularly those less familiar with digital tools—gain confidence and competence (R2, R5, R9). This capacity-building effort is complemented by the creation of a clear ICT plan that aligns with DepEd's digital transformation framework and delineates specific goals and monitoring processes (R6, R4).

Resource management was also identified as a key factor for sustainability. Administrators suggested maximizing existing DepEd resources, ensuring reliable internet connectivity through backups, and maintaining regular ICT monitoring and audits to safeguard data privacy (R3, R4, R8). Collaboration with the Division ICT unit and assigning a focal person to oversee ICT sustainability further reinforce accountability and long-term continuity (R7, R10).

### Theme Analysis and Discussion:

Adopting a strategic and sustainable approach to technology management in school operations has significant implications for educational leadership, institutional growth, and instructional innovation. Strategic planning ensures that technology initiatives are grounded in the specific needs and capacities of each school, allowing for gradual integration starting from digitization of records to comprehensive digital transformation frameworks. As highlighted in the Philippine context, systematic approaches that involve clear ICT planning and alignment with national frameworks such as DepEd's digital transformation drive have been instrumental in facilitating effective technology management, while maximizing available resources enhances sustainability and accessibility (RSIS International, 2024; World Bank, 2023).

Capacity building, manifested through ongoing mentoring, peer learning, onboarding programs, and inclusivity in training, directly addresses digital skill gaps among staff—a challenge consistently noted in Philippine and international studies (World Bank, 2023; UNESCO, 2023). Such professional development efforts foster digital confidence and competence, enabling schools to adapt smoothly to technological changes.

Resource optimization, which includes investing in essential infrastructure and ensuring routine audits and maintenance, creates resilient digital systems capable of supporting uninterrupted school operations (RSIS International, 2024). International research affirms that effective school leadership in technology management is central to embedding innovation within institutional culture, emphasizing distributed leadership, strategic investment in infrastructure, and robust support systems (Timotheou et al., 2022; ICETM, 2025). These elements contribute to a sustained cycle of technological maturity, equipping both educators and learners with 21st-century skills, and improving outcomes such as accessibility, operational efficiency, and employability (Nucamp, 2025).

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