TECHNOLOGY LEADERSHIP QUALITIES IN TRANSFORMING TEACHERS WITH 21ST CENTURY SKILLS

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ABSTRACT: *This descriptive-quantitative study examined the technology leadership qualities of school heads and their influence on teachers' 21st-century skills in selected public schools in the Zamboanga Peninsula. Using total enumeration sampling, 187 respondents (178 teachers and 9 school heads) participated in the study. Data were collected through a researcher-made questionnaire and analyzed using weighted mean and Pearson correlation. Results revealed that school heads demonstrated high technology leadership qualities (grand mean = 3.50), while teachers exhibited very high 21st-century skills (grand mean = 3.47). A statistically significant but very low relationship was found between the two variables ($r = 0.0726$, $p < 0.05$). The findings suggest that while leadership contributes to skill development, teachers' competencies are largely influenced by other factors such as professional development and self-directed learning. The study recommends strengthening leadership practices alongside institutional support systems to enhance teacher capacity in the 21st-century educational landscape.*

Keywords: Technology leadership, 21st-century skills, educational leadership, teachers, Philippines

INTRODUCTION

The rapid advancement of technology has significantly transformed educational systems, requiring teachers to develop competencies aligned with 21st-century skills such as communication, collaboration, critical thinking, and creativity. These skills are widely recognized as essential for preparing learners to succeed in a complex and technology-driven world [2, 1]. In the Philippine setting, the Department of Education envisions producing individuals who are equipped with competencies necessary for national development and global competitiveness [4].

School leadership plays a critical role in facilitating this transformation. Technology leadership, defined as the ability of school heads to guide, support, and sustain the integration of technology in teaching and learning, has become increasingly important in modern educational settings [9, 7. Effective leaders are expected to create environments that promote innovation, support teachers' professional growth, and ensure the appropriate use of digital tools [6]. As emphasized by [5], school principals must assume expanded roles in managing technological resources, training teachers, and fostering ICT integration.

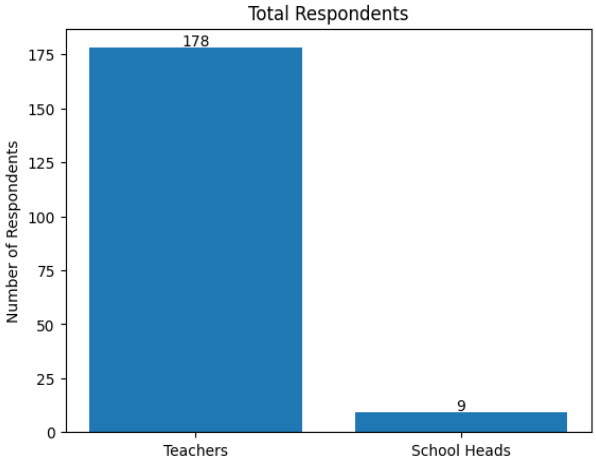
Despite the growing emphasis on technology integration, several challenges persist. Many educators continue to rely on traditional teaching practices that limit the development of higher-order thinking skills among students [9]. Additionally, gaps in leadership capacity and insufficient institutional support may hinder the effective implementation of technology-enhanced instruction [8]. These challenges highlight the need to examine how school heads' technology leadership influences teachers' ability to develop essential 21st-century competencies.

Teachers themselves play a vital role in this process, as they are expected to adapt to evolving instructional approaches and continuously enhance their professional skills. Continuous professional development is necessary to ensure that teachers are equipped to meet the demands of 21st-century education [2]. However, the extent to which leadership influences teacher competency development remains unclear.

This study, therefore, aims to examine the technology leadership qualities of school heads and their influence on teachers' 21st-century skills. Specifically, it investigates leadership in terms of ethical practice, performance improvement, technology management, and resource allocation, as well as teachers' competencies in communication, collaboration, critical thinking, and creativity. By identifying key relationships between these variables, the study seeks to contribute to the improvement of leadership practices and teacher development initiatives in educational institutions.

METHOD

This study employed a descriptive-quantitative research design to determine the relationship between school heads' technology leadership qualities and teachers' 21st-century skills. Data were collected using a researcher-made questionnaire with a 4-point Likert scale. The instrument measured leadership qualities and teachers' competencies across identified domains. Data analysis utilized weighted mean to determine levels of leadership and skills, and Pearson correlation coefficient to assess the relationship between variables. All ethical considerations, including informed consent and confidentiality, were observed.



Respondents of the Study

The respondents consisted of 187 participants, including 178 teachers and 9 school heads from selected public schools in the Zamboanga Peninsula. A total enumeration sampling

technique was used due to the limited number of respondents
.

RESULTS AND DISCUSSIONS

Parameters	Mean	Descriptive Rating
Ethical Practice of Facilitating Learning	3.47	Highly Exhibited
Improving Performance	3.50	Highly Exhibited
Managing Appropriate Technology	3.56	Highly Exhibited
Resources	3.47	Highly Exhibited
Grand Mean	**3.50**	**Highly Exhibited**

Overall results for Technology Leadership Qualities of School Heads

School heads' technology leadership qualities were rated Highly Exhibited, with a grand mean of 3.50. Among the domains, managing appropriate technology obtained the highest mean (M = 3.56), followed by improving performance (M = 3.50), ethical practice (M = 3.47), and resource management (M = 3.47).

These findings indicate that school heads are effective in integrating technology into educational practices and supporting instructional improvements. However, relatively lower ratings in decision-making and provision of technological resources suggest the need for enhanced strategic planning and infrastructure support.

Overall, the results affirm that school heads demonstrate strong leadership in fostering technology integration, which contributes to improved teaching and learning environments.

Parameters	Mean	Descriptive Rating
Communication	3.55	Highly Skilled
Collaboration	3.57	Highly Skilled
Critical Thinking	3.52	Highly Skilled
Creativity	3.52	Highly Skilled
Grand Mean	**3.47**	**Highly Skilled**

Overall results for Teachers' 21st Century Skills

Teachers exhibited a Highly Skilled level of 21st-century competencies, with a grand mean of 3.47. Collaboration obtained the highest mean (M = 3.57), followed by communication (M = 3.55), critical thinking (M = 3.52), and creativity (M = 3.52).

These findings suggest that teachers possess strong interpersonal, analytical, and innovative skills necessary for modern education. However, slightly lower ratings in analytical and creative processes indicate opportunities for further professional development.

Overall, the results demonstrate that teachers are well-prepared to meet the demands of 21st-century education.

Pearson's r Results on the School Heads' Technology Leadership Qualities on Teachers' 21st Century Skills

Variables	*r*	*p*	Decision	Interpretation
Technology Leadership Qualities And 21st Century Skills	0.726	< .001	Ho is rejected	Significant

The Pearson correlation analysis revealed a significant relationship between school heads' technology leadership qualities and teachers' 21st-century skills ($r = 0.0726$, $p < 0.05$). However, the correlation is very low, indicating minimal influence. The findings suggest that while school heads' technology leadership qualities—such as ethical practice in facilitating learning, improving performance, and managing technology and resources—significantly impact teachers' skills in areas like communication, collaboration, critical thinking, and creativity, the correlation is very low. This implies that teachers' acquisition of these skills is largely independent of the technological leadership qualities of school heads. Teachers often develop their professional skills through self-initiated activities such as training and seminars, while their technological competence in the classroom relies heavily on the guidance of school heads.

As educational demands continue to evolve, school heads are encouraged to further enhance their technological leadership skills. This includes seeking out new technologies, building labs, and teaching teachers how to integrate ICT (Information and Communication Technology) into the curriculum. School heads play a crucial role in setting educational technology goals and designing ongoing training programs for teachers to stay updated with current trends. Their leadership extends beyond technology to include learning, capacity building, community engagement, and effective resource management for technology integration.

Teachers are more likely to develop essential skills when school heads demonstrate strong technology leadership, as principals' behaviors can significantly influence teachers' attitudes and practices, either positively or negatively. As noted by [6], principals are responsible for guiding teachers in adopting and effectively integrating technology into the learning process. [8] further emphasize that principals must be skilled in technology leadership to implement 21st-century

education effectively in classrooms, ensuring the educational system adapts to technological advancements and government policies.
spaces.

CONCLUSION

The study drew the following key conclusions in sequence from the findings:

School heads demonstrate strong technology leadership qualities, particularly in managing technology, improving performance, and facilitating ethical practices. Teachers, on the other hand, exhibit high levels of 21st-century skills across communication, collaboration, critical thinking, and creativity.

Although a significant relationship exists between leadership and teacher competencies, the influence is minimal, indicating that teacher skill development is largely independent of leadership factors.

The study highlights the need for a holistic approach that combines strong leadership, continuous professional development, and institutional support to enhance teacher competencies in the digital age.

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