



TECHNOLOGICAL LEADERSHIP OF PUBLIC SECONDARY SCHOOL LEADERS IN LAGUNA PROVINCE: UPSKILLING TEACHERS AS DIGITAL CITIZEN

REYNANTE SEVILLO ANINGALAN

Graduate Studies and Applied Research,
Doctor of Education, Major in Educational Management
Laguna State Polytechnic University, San Pablo City Campus
reynante.aningalan@deped.gov.ph

ABSTRACT

In the rapidly evolving landscape of digital education, adaptability is essential for educational institutions to thrive. Balancing steadfastness with flexible strategies enables institutions to address rapid shifts and advancements effectively. School leaders must focus on instructional leadership and embrace their roles as technology leaders, empowering teachers and staff to enhance technical skills and integrate technology into the teaching-learning process. By fostering collaboration and leveraging diverse perspectives, leaders can navigate digital age challenges while fulfilling educational missions effectively. The significance of technology in educational leadership and management is undeniable, requiring leaders to strategically integrate technological solutions to improve educational effectiveness and efficiency. This transformative approach revolutionizes educational paradigms and redefines learning processes, enhancing accessibility and promoting lifelong learning. Embracing ICT proficiency and strategic technological leadership is pivotal for principals and teachers navigating the demands of the Fourth Industrial Revolution in the Philippine educational context.

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez,
Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas,
Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



This study employed a descriptive research design to gather data on technological leadership among school leaders in public secondary schools in Laguna Province. The study utilized survey tools and statistical analysis to identify relationships between variables, involving school leaders and teachers as respondents. The findings reveal that school leaders possess robust technological leadership skills across various domains and demonstrate strong support for educators pursuing further qualifications. The analysis shows a significant positive correlation between teachers' professional development, technological leadership skills, and upskilling as digital citizens. Recommendations include promoting gender diversity in leadership, tailored leadership development initiatives, and continuous support for teachers' professional advancement to enhance technological leadership and digital citizenship. Effective leadership practices play a central role in driving technology integration in teaching and nurturing teachers' overall professional growth.

Keywords: *technological leadership, upskilling teachers, digital citizen, visionary leadership*

INTRODUCTION

In the swiftly evolving landscape of digital education, adaptability is crucial for thriving educational institutions. Balancing steadfastness with flexible strategies is essential to address rapid shifts and advancements effectively. School leaders must not only focus on instructional leadership but also embrace their roles as technology leaders. This entails empowering teachers and staff to enhance their technical skills and integrate technology meaningfully into the teaching-learning process. By fostering collaboration and leveraging diverse perspectives,

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez,
Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas,
Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



leaders can navigate the digital age's challenges while fulfilling educational missions effectively.

Technology's growing significance in educational leadership and management is undeniable. As educational environments increasingly rely on technology, leaders must strategically integrate technological solutions to improve educational effectiveness and efficiency. This transformative approach goes beyond administrative shifts; it revolutionizes educational paradigms and redefines learning processes. Leaders need to envision and implement technology-driven educational strategies that enhance accessibility, transcend geographical and temporal boundaries, and promote lifelong learning. Embracing ICT proficiency and strategic technological leadership are pivotal for principals and teachers alike as they navigate the demands of the Fourth Industrial Revolution in the Philippine educational context.

METHODOLOGY

The research employed a descriptive research design to gather data on technological leadership among school leaders in public secondary schools in Laguna Province. This design aimed to provide a detailed summary of specific events experienced by school leaders and teachers, focusing on describing the extent and quality of technological leadership. The study utilized survey tools to collect data, employing statistical analysis to identify and explain relationships between variables.

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez,
Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas,
Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



Respondents include school leaders such as principals, officers-in-charge, and teacher coordinators, as well as teachers from various schools in Laguna Province. The sampling method are clustered sampling with proportionate allocation, ensuring representation across schools. Data collection involved obtaining approval from school division superintendents through principals, distributing researcher-made questionnaires to participants, and ensuring confidentiality under the Data Privacy Act of 2012. The analysis utilizes statistical tools such as frequency, percentage, weighted mean, and composite mean to interpret the gathered data and assess the extent of technological leadership and capacity-building programs in the educational setting.

RESULTS AND DISCUSSION

Part I. Level of School Leaders' Technological Leadership

Technological leadership refers to the school leaders' ethical practice of using technology to facilitate learning and improve performance through appropriate processes and resources.

Table 1. Level of school leaders' technological leadership qualities relative to visionary leadership

<i>The school leaders.....</i>	Mean	SD	VI
1. Envision an organized, innovative instructional environment.	4.42	0.63	VH
2. Compare and match the different proposals with the school's technological plan.	4.32	0.65	VH

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



3. Include technology practices in developing a strategic plan.	4.44	0.62	VH
4. Identify educational and technology-related instructional design plans.	4.37	0.64	VH
5. Discuss the challenges of integrating stakeholders in efforts involving educational technology.	4.30	0.67	VH
6. Lead the development of a shared vision that maximizes ICT usage.	4.31	0.64	VH
7. Participate in the implementation of technology strategic plans.	4.40	0.65	VH
8. Impose training on teachers and non-teaching employees to enhance their knowledge of information technology.	4.44	0.69	VH
9. Utilize data in making-technology related decisions.	4.45	0.64	VH
10. Advocate the use of technology-infused strategic plans in school community planning.	4.42	0.65	VH
11. Build a unified vision that maximizes the use of ICT.	4.32	0.68	VH
12. Take part in putting technology strategic plans into action.	4.38	0.68	VH
13. Encourage teachers and non-teaching staff to undergo training to improve their information technology skills.	4.52	0.63	VH
14. Use data to inform your technological decisions.	4.41	0.70	VH
15. Promote participation in school community planning technology-infused strategic plans.	4.39	0.69	VH

Overall	4.39	0.66	VH
----------------	-------------	-------------	-----------

Notes: 1.00-1.79 (Very Low); 1.80-2.59 (Low); 2.60-3.39 (Fair); 3.40-4.19 (High); 4.20-5.00 (Very High)

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



From the statements above, "Encourage teachers and non-teaching staff to undergo training to improve their information technology skills." yielded the highest mean score (M=4.52, SD=0.63) and was remarked as Very High. On the other hand, the statement "Discuss the challenges of integrating stakeholders in efforts involving educational technology." received the lowest mean score of responses with (M=4.30, SD=0.67) yet was remarked as Very High. In many schools, it is observed that a significant number of teachers and non-teaching staff lack proficiency in using basic technology tools and applications. This can manifest in their inability to effectively use software for lesson planning, grading, or administrative tasks, or their limited skills in utilizing educational technology resources in the classroom. Encouraging and providing opportunities for ongoing professional development in this area can help bridge the technological gap, foster a more technology-savvy workforce, and ultimately enhance the overall effectiveness and efficiency of teaching, learning, and administrative processes within the school. The level of school leader's technological leadership qualities relative to visionary leadership attained a weighted mean score of 4.39 and a standard deviation of 0.66 and was Very High among the respondents.

Table 2. Level of school leaders' technological leadership qualities relative to Digital Age Learning Culture

<i>The school leaders.....</i>	Mean	SD	VI
1. Give students a way to connect their digital devices to the context of the classroom.	4.21	0.85	VH

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez,
Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas,
Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



2. Give teachers several opportunities to develop their technology integration skills.	4.35	0.65	VH
3. Create spaces that are learner-centered equipped with technology and educational tools to accommodate the varying requirements of each student.	4.23	0.72	VH
4. Initiate improvements to the school ICT equipment.	4.24	0.72	VH
5. Upgrade technologies to make learning more effective.	4.25	0.71	VH
6. Provide funds to ensure teachers' proficiency with ICT for professional development.	4.08	0.87	H
7. Enhance the teaching and learning process, employing technology to gather and evaluate data.	4.35	0.65	VH
8. Utilize technology to enhance instructional oversight.	4.29	0.69	VH
9. Utilize current research and technology standards in curriculum development.	4.19	0.72	H
10. Promote effective use of ICT for teaching and learning.	4.42	0.67	VH
Overall	4.26	0.73	VH

Notes: 1.00-1.79 (Very Low); 1.80-2.59 (Low); 2.60-3.39 (Fair); 3.40-4.19 (High); 4.20-5.00 (Very High)

From the statements above, "Promote effective use of ICT for teaching and learning." yielded the highest mean score (M=4.42, SD=0.67) and was remarked as Very High. On the other hand, the statement "Provide funds to ensure teachers' proficiency with ICT for professional development." received the lowest mean score of responses with (M=4.08, SD=0.87) yet was remarked as High. The level of school leader's technological leadership qualities relative to digital age learning culture attained a weighted mean score of 4.26 and a standard deviation of 0.73 and was Very High among the respondents. Providing

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



comprehensive professional development and training opportunities for teachers is essential to equip them with the necessary skills and knowledge to integrate ICT into their teaching practices effectively. These training sessions can cover a variety of topics, such as using educational software, creating multimedia presentations, utilizing online resources, and incorporating digital tools for assessment and collaboration.

Table 3. Level of school leaders’ technological leadership qualities relative to Excellence in Professional Practice

<i>The school leaders.....</i>	Mean	SD	VI
1. Keep up with new developments in the efficient application of technology.	4.33	0.65	VH
2. Establish technological learning groups to motivate academics to increase output.	4.27	0.69	VH
3. Deploy a variety of digital tools to improve faculty connection and collaboration.	4.27	0.71	VH
4. Exemplify ICT-based successful communication within the school community.	4.29	0.70	VH
5. Assess the potential of new technology to enhance student learning.	4.31	0.68	VH
6. Create and implement techniques for assessing the efficiency of technology use.	4.25	0.67	VH
7. Give teachers the opportunity to use ICT in the classroom.	4.35	0.68	VH
8. Communicate with stakeholders, including peers, via technology.	4.37	0.69	VH
9. Utilize management tools (i.e. google classroom, Microsoft outlook etc.) based on technology to access the records of the teachers, staff, and students.	4.42	0.69	VH

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



10. Using cutting-edge application features, simulate the integration of data from many software applications.	4.21	0.73	VH
--	------	------	----

Overall	4.31	0.69	VH
----------------	-------------	-------------	-----------

Notes: 1.00-1.79 (Very Low); 1.80-2.59 (Low); 2.60-3.39 (Fair); 3.40-4.19 (High); 4.20-5.00 (Very High)

From the statements above, "Utilize management tools based on technology to access the records of the teachers, staff, and students." yielded the highest mean score (M=4.42, SD=0.69) and was remarked as Very High. On the other hand, the statement "Using cutting-edge application features, simulate the integration of data from many software applications." received the lowest mean score of responses with (M=4.21, SD=0.73) yet was remarked as Very High. The level of school leader's technological leadership qualities relative to excellence in professional practice attained a weighted mean score of 4.31 and a standard deviation of 0.69 and was Very High among the respondents.

Table 4. Level of school leaders' technological leadership qualities relative to Excellence in Systematic Improvement

<i>The school leaders.....</i>	Mean	SD	VI
1. Keep up with new developments in the efficient application of technology.	4.31	0.62	VH
2. Establish technological learning groups to motivate academics to increase output.	4.27	0.68	VH
3. Deploy a variety of digital tools to improve faculty connection and collaboration.	4.32	0.67	VH
4. Exemplify ICT-based successful communication within the school community.	4.16	0.78	H

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



5. Assess the potential of new technology to enhance student learning.	4.26	0.68	VH
6. Create and implement techniques (i.e. surveys and feedback, workflow analysis, benchmarking and performance metrics) for assessing the efficiency of technology use.	4.45	0.63	VH
7. Give teachers the opportunity to use ICT in the classroom.	4.30	0.69	VH
8. Communicate with stakeholders, including peers, via technology.	4.33	0.66	VH
9. Utilize management tools (i.e. google classroom, Microsoft outlook etc.) based on technology to access the records of the teachers, staff, and students.	4.24	0.70	VH
10. Using cutting-edge application features, simulate the integration of data from many software applications.	4.36	0.65	VH
Overall	4.30	0.68	VH

Notes: 1.00-1.79 (Very Low); 1.80-2.59 (Low); 2.60-3.39 (Fair); 3.40-4.19 (High); 4.20-5.00 (Very High)

From the statements above, "Create and implement techniques for assessing the efficiency of technology use." yielded the highest mean score (M=4.45, SD=0.63) and was remarked as Very High. On the other hand, the statement "Exemplify ICT-based successful communication within the school community." received the lowest mean score of responses with (M=4.16, SD=0.78) yet was remarked as High. The level of school leader's technological leadership qualities relative to systematic improvement attained a weighted mean score of 4.30 and a standard deviation of 0.68 and was Very High among the respondents.

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez,
Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas,
Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



Table 5. Level of school leaders' technological leadership qualities relative

to Excellence in Digital Citizenship

<i>The school leaders.....</i>	Mean	SD	VI
1. Promote and model responsible social interaction related to the use of technology.	4.34	0.65	VH
2. Inform the school community about the potential health hazards of technology.	4.31	0.68	VH
3. Facilitate the development of a shared cultural understanding using ICT.	4.28	0.66	VH
4. Inform the stakeholders of their basic digital rights.	4.25	0.71	VH
5. Teach teachers and students how to safeguard student information from outside sources that could be harmful.	4.42	0.70	VH
6. Support the legal and ethical use of technology, create and disseminate clear ethics, regulations, and procedures.	4.39	0.64	VH
7. Promote and model legal and ethical use of ICT.	4.40	0.66	VH
8. Promote safe and healthy use of technology resources.	4.42	0.64	VH
9. Inspire teachers to use ICT in teaching learners by means of professional development and training, incentives and recognition.	4.44	0.64	VH
10. Develop initiatives to educate educators, staff, and students on social, ethical, and legal issues around technology.	4.32	0.67	VH
Overall	4.36	0.66	VH

Notes: 1.00-1.79 (Very Low); 1.80-2.59 (Low); 2.60-3.39 (Fair); 3.40-4.19 (High); 4.20-5.00 (Very High)

From the statements above, "Inspire teachers to use ICT in teaching learners by means of professional development and training, incentives and recognition." yielded the highest

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



mean score (M=4.44, SD=0.64) and was remarked as Very High. On the other hand, the statement "Inform the stakeholders of their basic digital rights." received the lowest mean score of responses with (M=4.25, SD=0.71) yet was remarked as Very High. The level of school leader's technological leadership qualities relative to digital citizenship attained a weighted mean score of 4.36 and a standard deviation of 0.66 and was Very High among the respondents.

Part II. Level of Teachers' Professional Development

Professional development of teachers refers to the processes and activities designed to enhance the professional knowledge, skills, and attitudes of educators so that they might, in turn, improve the learning of students.

Table 6 presents the level of teachers' professional development in terms of educational attainment.

Table 6. Level of Teachers' Professional Development in terms of Educational Attainment

<i>The school leaders.....</i>	Mean	SD	VI
1. Have pursued any additional certifications, degrees, or specialized training beyond their highest level of education.	4.20	0.73	EO
2. Have perceived the relationship between the teacher's level of educational attainment and their engagement in professional development activities.	4.23	0.65	EO
3. Have encouraged and supported teachers in pursuing higher educational degrees or certifications.	4.33	0.65	EO

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



4. Have recognized and values the additional educational attainments of teachers.	4.36	0.63	EO
5. Offers flexible scheduling or accommodations to support teachers pursuing further education.	4.28	0.66	EO
Overall	4.28	0.67	EO

Notes: 1.00-1.79 (Very limited Opportunities); 1.80-2.59 (Limited Opportunities); 2.60-3.39 (Moderate Opportunities); 3.40-4.19 (Sufficient Opportunities); 4.20-5.00 (Extensive Opportunities)

From the statements above, "The school leaders have recognized and values the additional educational attainments of teachers." yielded the highest mean score (M=4.36, SD=0.63) and was remarked as Extensive. On the other hand, the statement "The school leaders have pursued any additional certifications, degrees, or specialized training beyond their highest level of education." received the lowest mean score of responses with (M=4.20, SD=0.73) yet was remarked as Extensive. The level of teachers' professional development in terms of educational attainment attained a weighted mean score of 4.28 and a standard deviation of 0.67 and was rated of having an Extensive Opportunities.

Table 7. Level of Teachers' Professional Development in terms of Self-paced Micro Learning

<i>The school leaders.....</i>	Mean	SD	VI
1. Have access to online micro-learning modules that I can complete at my own pace.	4.04	0.83	SO
2. Have opportunities to participate in virtual micro-workshops or webinars focused on specific teaching strategies or topics.	4.06	0.83	SO

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan
Managing Editor: Raymart O. Basco

Associate Editor: Andro M. Bautista
Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



3. Have a library of micro-learning resources (e.g., podcasts, articles, interactive simulations) that can explore independently.	3.83	0.90	SO
4. Have access to mobile apps or learning platforms that provide short and focused learning modules on various aspects of teaching and learning.	4.12	0.79	SO
5. Have educational video tutorials or screencasts are made available to help teachers improve their skills in a self-paced manner.	4.07	0.86	SO
Overall	4.02	0.85	SO

Notes: 1.00-1.79 (Very limited Opportunities); 1.80-2.59 (Limited Opportunities); 2.60-3.39 (Moderate Opportunities); 3.40-4.19 (Sufficient Opportunities); 4.20-5.00 (Extensive Opportunities)

From the statements above, "The school leaders have access to mobile apps or learning platforms that provide short and focused learning modules on various aspects of teaching and learning." yielded the highest mean score (M=4.12, SD=0.79) and was remarked as Sufficient. On the other hand, the statement "The school leaders have a library of micro-learning resources (e.g., podcasts, articles, interactive simulations) that can explore independently." received the lowest mean score of responses with (M=3.83, SD=0.90) yet was remarked as Sufficient.

Table 8. Level of Teachers' Professional Development in terms of Membership to Professional Organization

<i>The school leaders.....</i>	Mean	SD	VI
--------------------------------	-------------	-----------	-----------

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



1. Encourage and support teachers to become members of professional organizations related to their field.	4.24	0.65	EO
2. Have access to resources, publications, and knowledge-sharing platforms through their professional organization membership(s).	4.12	0.73	SO
3. Allow teachers to attend conferences, workshops, or other professional development events.	4.34	0.67	EO
4. Provide financial assistance or incentives for teachers to join and maintain membership in professional organizations.	3.99	0.86	SO
5. Recognize and value the professional development activities teachers undertake through their membership in professional organizations.	4.28	0.65	EO
Overall	4.19	0.73	SO

Notes: 1.00-1.79 (Very limited Opportunities); 1.80-2.59 (Limited Opportunities); 2.60-3.39 (Moderate Opportunities); 3.40-4.19 (Sufficient Opportunities); 4.20-5.00 (Extensive Opportunities)

From the statements above, "Allow teachers to attend conferences, workshops, or other professional development events." yielded the highest mean score (M=4.34, SD=0.67) and was remarked as Extensive. On the other hand, the statement "Provide financial assistance or incentives for teachers to join and maintain membership in professional organizations." received the lowest mean score of responses with (M=3.99, SD=0.86) yet was remarked as Sufficient.

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



Part III. Level of Teachers' Upskilling as Digital Citizen

Digital citizenship refers to the capacity to interact constructively, critically, and skillfully in the digital sphere, utilizing the abilities of effective communication and production, and engaging in social involvement that respects others' rights and dignity while using technology responsibly.

Table 11 illustrates the level of teachers' upskilling as digital citizen in terms of support to classrooms.

Table 9. Level of teachers' upskilling as digital citizen in terms of support to classrooms

<i>The school leaders.....</i>	Mean	SD	VI
1. Increase teacher's capacity as digital citizen by providing internet connectivity in classroom.	4.11	0.80	HC
2. Ensure that ICT is used effectively across the curriculum.	4.30	0.70	VHC
3. Demonstrate emotional maturity and a passion for and interest in reaching higher goals.	4.36	0.65	VHC
4. Create methods to assist teachers in integrating technology into their classrooms.	4.24	0.70	VHC
5. Use technology-based management systems to access teachers, staff and student records.	4.31	0.70	VHC
Overall	4.26	0.72	VHC

Notes: 1.00-1.79 (Very Low Capacity); 1.80-2.59 (Low Capacity); 2.60-3.39 (Moderate Capacity); 3.40-4.19 (High Capacity); 4.20-5.00 (Very High Capacity)

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez,
Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas,
Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



From the statements above, "Demonstrate emotional maturity and a passion for and interest in reaching higher goals." yielded the highest mean score (M=4.36, SD=0.65) and was remarked as Very High. On the other hand, the statement "Increase teacher's capacity as digital citizen by providing internet connectivity in classroom." received the lowest mean score of responses with (M=4.11, SD=0.80) yet was remarked as Very High. The level of teachers' upskilling as digital citizen in terms of support to classrooms attained a weighted mean score of 4.26 and a standard deviation of 0.72 and was Very High Capacity among the respondents.

Table 10. Level of teachers' upskilling as digital citizen in terms of ICT

Integration

<i>The school leaders.....</i>	Mean	SD	VI
1. Have proficiency in using digital technologies (e.g., computers, smartphones, online platforms) for teaching and learning purposes for the provision of technical assistance to teachers.	4.38	0.65	VHC
2. Encourage you to integrate Information and Communication Technologies (ICT) into your classroom instruction and lesson planning.	4.41	0.65	VHC
3. Can critically evaluate the credibility and reliability of online information sources for educational purposes.	4.40	0.63	VHC
4. Engage in professional development opportunities or training related to the effective use of digital technologies and ICT in education.	4.37	0.66	VHC

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez,
Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas,
Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



5. Encourage and model responsible and ethical digital citizenship practices (e.g., online safety, digital etiquette, privacy protection) for your students. 4.36 0.65 VHC

Overall	4.38	0.65	VHC
---------	------	------	-----

Notes: 1.00-1.79 (Very Low Capacity); 1.80-2.59 (Low Capacity); 2.60-3.39 (Moderate Capacity); 3.40-4.19 (High Capacity); 4.20-5.00 (Very High Capacity)

From the statements above, “Encourage you to integrate Information and Communication Technologies (ICT) into your classroom instruction and lesson planning.” yielded the highest mean score (M=4.41, SD=0.65) and was remarked as Very High. On the other hand, the statement “Encourage and model responsible and ethical digital citizenship practices (e.g., online safety, digital etiquette, privacy protection) for your students.” received the lowest mean score of responses with (M=4.36, SD=0.65) yet was remarked as Very High.

Table 11. Level of teachers’ upskilling as digital citizen in terms of Emotional Well-Being

<i>The school leaders.....</i>	Mean	SD	VI
1. Demonstrate your commitment to upholding the moral principles and ethical principles governing the use of technology.	4.45	0.60	VHC
2. Observe moral and proper conduct when using technology.	4.46	0.60	VHC
3. Acquire digital skills to use technology in their teaching.	4.45	0.61	VHC
4. Increase their capacity to identify hazards to their wellbeing, such as those that may be present online.	4.44	0.61	VHC

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan
Managing Editor: Raymart O. Basco

Associate Editor: Andro M. Bautista
Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



5. Utilize the digital network with a sense of urgency and responsibility.	4.44	0.61	VHC
--	------	------	-----

Overall	4.45	0.61	VHC
----------------	-------------	-------------	------------

Notes: 1.00-1.79 (Very Low Capacity); 1.80-2.59 (Low Capacity); 2.60-3.39 (Moderate Capacity); 3.40-4.19 (High Capacity); 4.20-5.00 (Very High Capacity)

From the statements above, "Observe moral and proper conduct when using technology." yielded the highest mean score (M=4.46, SD=0.60) and was remarked as Very High. On the other hand, the statement "Increase their capacity to identify hazards to their wellbeing, such as those that may be present online." and "Utilize the digital network with a sense of urgency and responsibility." received the lowest mean score of responses with (M=4.44, SD=0.61) yet was remarked as Very High. The level of teachers' upskilling as digital citizen in terms of emotional well-being attained a weighted mean score of 4.45 and a standard deviation of 0.61 and was Very High Capacity among the respondents.

Table 12. Level of teachers' upskilling as digital citizen in terms of Digital Competence

<i>The school leaders.....</i>	Mean	SD	VI
1. Encourage teachers to use technology in their teaching.	4.52	0.57	VHC
2. Improve the digital skills of teachers through training and development.	4.43	0.64	VHC
3. Prepare teachers to develop online behavior and manage online risks of digital technologies.	4.42	0.63	VHC

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



4. Establish clear and coherent standards for the skills development of teachers.	4.41	0.64	VHC
5. Teach students and teachers how to be intelligent consumers in the digital economy.	4.39	0.64	VHC
Overall	4.30	0.68	VHC

Notes: 1.00-1.79 (Very Low Capacity); 1.80-2.59 (Low Capacity); 2.60-3.39 (Moderate Capacity); 3.40-4.19 (High Capacity); 4.20-5.00 (Very High Capacity)

From the statements above, "Encourage teachers to use technology in their teaching." yielded the highest mean score (M=4.52, SD=0.57) and was remarked as Very High. On the other hand, the statement "Teach students and teachers how to be intelligent consumers in the digital economy." received the lowest mean score of responses with (M=4.39, SD=0.64) yet was remarked as Very High. The level of teachers' upskilling as digital citizen in terms of Digital Competence attained a weighted mean score of 4.30 and a standard deviation of 0.68 and was Very High Capacity among the respondents.

Table 13. Level of teachers' upskilling as digital citizen in term Partnership with Digital Experts

<i>The school leaders.....</i>	Mean	SD	VI
1. Recruit and retain highly competent personnel who use technology creatively and proficiently.	4.16	0.73	HC
2. Leverage strategic partnerships to support systemic improvement.	4.16	0.72	HC
3. Invite high technology competent personnel to advance the school's IT goal.	4.13	0.74	HC
4. Foster digital skills and incorporate ICT inside the school.	4.19	0.72	HC

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



5. Integrate digital skills into existing subjects.	4.29	0.70	VHC
Overall	4.18	0.72	HC

Notes: 1.00-1.79 (Very Low Capacity); 1.80-2.59 (Low Capacity); 2.60-3.39 (Moderate Capacity); 3.40-4.19 (High Capacity); 4.20-5.00 (Very High Capacity)

From the statements above, "Integrate digital skills into existing subjects." yielded the highest mean score (M=4.29, SD=0.70) and was remarked as Very High. On the other hand, the statement "Invite high technology competent personnel to advance the school's IT goal." received the lowest mean score of responses with (M=4.13, SD=0.74) yet was remarked as High. The level of teachers' upskilling as digital citizen in terms of partnership with digital experts attained a weighted mean score of 4.18 and a standard deviation of 0.72 and was High Capacity among the respondents.

Significant Relationship Between the Professional Development and Technological Leadership of Teachers

Table 14 demonstrates the significant correlation between the professional development and technological leadership of teachers.

Table 14. Relationship between the Professional Development and Technological Leadership of Teachers

		Technological Leadership of Teachers			
Professional Development	Visionary Leadership	Digital Age Learning Culture	Excellence in Professional Practice	Systematic Improvement	Digital Citizenship

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



Educational Attainment	0.645*	0.667*	0.679*	0.685*	0.685*
Self-Paced Micro Learning	0.366*	0.515*	0.516*	0.508*	0.593*
Membership to Professional Organization	0.682*	0.719*	0.697*	0.724*	0.813*

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

The professional development was observed to have a significant positive correlation to the technological leadership of teachers. This is based on the computed correlation coefficient values obtained from the tests. The magnitude of the relationship was observed to have a range of from weak to very high correlation coefficient. Furthermore, the p-values obtained were less than the significance alpha 0.05, hence there is a significance.

Teachers who engaged in more professional development activities focused on technology integration, such as workshops, seminars, and online courses, reported higher levels of technological leadership skills, including digital citizenship, professional development, and systemic improvement. The study highlighted the importance of providing continuous professional development opportunities to enhance teachers' technological leadership abilities (Thannimalai & Raman, 2018).

Professional development program had a significant positive impact on teachers' technological leadership competencies. The treatment group demonstrated higher levels of technological leadership skills, including visionary leadership, digital age learning culture,

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez,
Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas,
Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



professional practice, and systemic improvement, compared to the control group. The importance of providing targeted professional development opportunities to empower teachers as technological leaders in their schools (Arokiasamy et al., 2020).

Table 15. Relationship between the Professional Development to Teachers’ Upskilling as Digital Citizen

Professional Development	Teachers’ Upskilling as Digital Citizen				
	Support to Classrooms	ICT Integration	Emotional Well-Being	Digital Competence	Partnership with Digital Experts
	R-value	R-value	R-value	R-value	R-value
Educational Attainment	0.703***	0.744***	0.766***	0.762***	0.775***
Self-Paced Micro Learning	0.499***	0.501***	0.457***	0.444***	0.505***
Membership to Professional Organization	0.729***	0.724***	0.708***	0.707***	0.747***

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

The professional development was observed to have a significant positive correlation to the teachers’ upskilling as digital citizen. This is based on the computed correlation coefficient values obtained from the tests. The magnitude of the relationship was observed to have a range of from moderate to high correlation coefficient. Furthermore, the p-values obtained were less than the significance alpha 0.05, hence there is a significance.

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



Professional development programs for teachers is important to develop their digital citizenship skills, as they play a crucial role in shaping students' attitudes and behaviors towards technology. It suggests that professional development should focus on areas such as online safety, privacy, and ethical use of digital resources, as well as promoting critical thinking and media literacy. One of the competence areas identified is "Digital Citizenship," which encompasses skills related to online behavior, digital communication, and managing one's digital identity (Vuorikari et al., 2016).

Redecker, C. (2017) stressed one of the key competence areas identified in the framework is "Facilitating Learners' Digital Competence," which includes the ability to promote digital citizenship among students. The report highlights the importance of professional development programs that equip teachers with the knowledge and skills to model and promote responsible and ethical use of digital technologies, as well as to address issues such as online safety, privacy, and digital identity management. Educators need to foster in order to effectively integrate digital technologies into teaching and learning.

Table 16. Regression on Teachers' Upskilling as Digital Citizen Significantly Affected by Technological Leadership

Model	B	SE	β	t	p
Constant	0.58	0.107		5.365	0.000
<i>Visionary Leader</i>		0.066	0.166	2.450*	0.015
<i>Excellence in Professional Practice</i>		0.105	0.236	2.090*	0.037
<i>Systematic Improvement</i>		0.077	0.129	1.560	0.120
<i>Digital Citizenship</i>		0.073	0.640	8.332*	0.000
<i>Technological Leadership</i>		0.252	-0.233	-0.935	0.350

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez,
Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas,
Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



R-squared	0.78	
Adjusted R-squared	0.78	
Standard Error of the Estimate	0.26	
F(5,394)		276.46* < .001

* $p < 0.05$

The table 16 presents the results of a regression analysis examining the effect of technological leadership qualities (independent Variable) to the teachers' upskilling as digital citizens (dependent variable). The regression model explains 78% of the variance in teachers' upskilling (R-squared = 0.78). The F-test of the overall model is significant ($F(5,394) = 276.46$, $p < .001$), indicating that the regression model is a good fit for the data. Hence, the results were significant. The standard error of the estimate is 0.26, reflecting the average deviation between observed and predicted teachers' upskilling as digital citizens.

Dexter (2011) explores the role of technological leadership in enhancing communication and fostering digital citizenship among teachers. The author argues that effective technological leadership, which involves providing guidance, support, and professional development opportunities, is crucial in helping teachers develop the necessary skills and competencies to navigate the digital landscape responsibly and ethically. It highlights the importance of technological leaders in creating a culture of digital citizenship within schools, promoting the responsible and ethical use of technology, and ensuring that teachers have access to the resources and training they need to become proficient digital citizens themselves.

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez,
Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas,
Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



Table 17. Moderation Analysis of Professional Development to Technological

Leadership and Upskilling

	Estimate	SE	95% Confidence Interval		Z	p
			Lower	Upper		
Techno-Leadership	0.6557	0.0441	0.571	0.7465	14.87	< .001
Professional Development	0.2582	0.0414	0.183	0.3376	6.23	< .001
Techno-Leadership*Professional Development	-0.0567	0.0347	-0.122	0.0152	-1.64	0.102

These results try to show that professional development could moderate the relationship between technological leadership and upskilling of teachers. It so happens that if techno-leadership is to accept upskilling, it is significant (0.6557, $P < .001$), prof dev with upskilling (0.2585, $p < .001$) but technology to connect with prof dev, no significance (-0.0567, $p < .102$). So professional development does not moderate the relationship between techno-leadership and upskilling teachers.

Tan et. al. (2021) examined the role of an ecosystem of support, including techno-leadership, in facilitating the digital upskilling of teachers. Professional development opportunities were important, they did not moderate the relationship between techno-leadership and teachers' digital upskilling. Instead, techno-leadership played a direct and

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



crucial role in creating a supportive environment for digital upskilling, regardless of the availability of professional development programs. effective techno-leadership involves providing vision, resources, and ongoing support for teachers to integrate technology into their teaching practices. Professional development, while valuable, is not a substitute for strong techno-leadership, as it is the leadership that creates the conditions for successful digital upskilling.

CONCLUSION

1. The majority of respondents fall within the age range of 34-43 years old, indicating a cohort that may be experiencing a surge in career advancement, as supported by prior research.
2. Concerning the length of service, a substantial proportion of respondents have 6-10 years of experience, a critical juncture where educators seek opportunities for advancement and specialization.
3. The diversity of respondents' areas of specialization underscores the richness of educational backgrounds among educators.
4. The distribution of respondents across different high schools provides valuable insights into assessing school effectiveness and promoting equity and access in education.
5. The school leaders possess a robust set of technological leadership skills across various domains, encompassing visionary leadership, cultivation of a digital learning environment,

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez,
Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas,
Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



excellence in professional practice, systematic improvement, and promotion of digital citizenship.

6. The school leaders in nurturing teachers' professional growth across multiple dimensions demonstrate strong support for educators pursuing further educational qualifications yet reveal opportunities for optimizing resources and assistance in self-paced micro-learning and membership to professional organizations

7. The school leaders in enhancing teachers' digital citizenship across diverse dimensions exhibit very high capacities in promoting ICT utilization in classrooms, encouraging technology integration, fostering emotional well-being, improving digital competence, and fostering partnerships with digital experts.

8. The analysis reveals a significant positive correlation between teachers' professional development and their technological leadership skills as well as their upskilling as digital citizens. These correlations indicate that engaging in professional development activities, such as workshops and seminars focused on technology integration, is associated with higher levels of technological leadership and digital citizenship among teachers.

9. The regression analysis reveals a significant correlation between teachers' advancement in digital citizenship and specific dimensions of technological leadership. Notably, visionary leadership and excellence in professional practice positively influence teachers' development in digital citizenship, indicating the critical role of effective leadership in fostering teachers' digital skills.

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez,
Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas,
Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



10. The moderation analysis aimed to investigate how professional development influences the relationship between technological leadership and teachers' upskilling. While both technological leadership and professional development individually correlated significantly with teachers' upskilling, their combined effect, represented by the interaction term, did not reach statistical significance. Thus, professional development does not seem to moderate the association between technological leadership and teachers' upskilling.

RECOMMENDATIONS

Based on the results of the study, the following recommendations are suggested.

1. There is a need to promote gender diversity in educational leadership roles to enhance leadership effectiveness and organizational success. Initiatives focused on recruiting, retaining, and advancing women in leadership positions should be implemented.
2. Tailored leadership development initiatives should be designed to address the evolving needs and preferences of educators at different career stages, particularly those with 6-10 years of experience seeking advancement and specialization opportunities.
3. Embrace the diversity of educators' areas of specialization to enrich curriculum development, instructional practices, and foster dynamic learning environments that promote critical thinking skills and creativity.
4. Utilize the distribution of respondents across different high schools to assess school effectiveness and advocate for policies that ensure equity and access in education.

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez,
Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas,
Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



5. Strengthen the technological leadership skills of school leaders across various domains to effectively integrate technology into teaching practices, foster innovative learning environments, and advocate for responsible technology use.

6. Provide ongoing support and investment in teachers' professional advancement, optimizing resources for educational qualifications, self-paced micro-learning, and membership to professional organizations to cultivate a culture of continual learning and enhance teaching effectiveness.

7. Foster continuous support and collaboration among school leaders, teachers, and digital experts to elevate teachers' digital citizenship skills, ensure responsible technology use, and enhance student outcomes in the digital era.

8. Emphasize the importance of continuous professional development in enhancing teachers' technological leadership skills and digital citizenship, with targeted programs focusing on technology integration, online safety, privacy, and ethical use of digital resources.

9. Acknowledge the critical role of effective leadership, particularly visionary leadership and excellence in professional practice, in fostering teachers' development in digital citizenship. Further exploration and refinement of measurement methodologies for systematic improvement and technological leadership are recommended.

10. Recognize the significance of robust technological leadership in creating conducive conditions for teachers' digital upskilling. Effective leadership practices, characterized by vision, support, and resource allocation, play a central role in driving teachers' integration of technology into their teaching practices and nurturing their overall professional growth.

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez,
Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas,
Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



REFERENCES

- ALRAKHAW et al .(2023) Microsoft Word - 6 47959 45328368 Systematic SLR Hazem
Template - Charts - Final -edited.docx (researchgate.net) Journal of Theoretical
and Applied Information Technology 28th February 2023. Vol.101. No 4 © 2023
Little Lion Scientific ISSN: 1992-8645
- (Dahalan et al 2023)Gamification and Game Based Learning for Vocational Education
and Training: A Systematic Literature Review | Education and Information
Technologies (springer.com)Volume 29, pages 1279–1317, (2024)
- (Montenegro et al 2023) Computers | Free Full-Text | Impact of the Implementation of
ChatGPT in Education: A Systematic Review (mdpi.com)
<https://doi.org/10.3390/computers12080153>
- Afshari, M., Bakar, K. A., Luan, W. S., Samah, B. A., & Fooi, F. S. (2009). Technology and
school leadership. *Technology, Pedagogy and Education*, 18(2), 235-248.
<https://doi.org/10.1080/14759390902992527>
- Agusiobo, H.C. & Nwobodo, D. (2017). Analysis of capacity building needs of secondary
school principals in Enugu state. *International Journal of Educational and Research*.
5(12),65-76.
- Akram, M., Iqbal, M. Z., Azmi, F. T., & Bashir, L. (2022). Exploring the Relationship between
Digital Citizenship and Well-Being of In-Service Teachers. *International Journal of
Instruction*, 15(2), 471-488. <https://doi.org/10.29333/iji.2022.15226a>

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez,
Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas,
Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



Alkrdem, M. (2014). Technological leadership behavior of high school headteachers in Asir Region, Saudi Arabia. *Journal of International Research*, 10(2), 95-100.

Anderson, T. (2018). Towards a Theory of Online Learning. In T. Anderson & F. Elloumi (Eds.), *Theory and Practice of Online Learning* (pp. 45-74). Athabasca University Press.

Antonio, V. & Lorenzo, N. (2019). Ilocano administrators' adoption and use of ICT in the management of public secondary schools. *Asia Pacific Journal of Multidisciplinary Research*. 7(2), 1-15.

Arifin, I., Naway, F. A., Kusumah, R. G. T., Dwiharja, L. M., & Putra, N. M. D. (2020). Exploring Principals' Digital Citizenship Behavior: Empirical Evidence from Indonesia. *International Journal of Instruction*, 13(2), 291-306. <https://doi.org/10.29333/iji.2020.13220a>

Armstrong, M. (2006). *A Handbook on personal management practice*, 10th ed. London: Kogan Page.

Arokiasamy, A. R. A., Ismail, R., Ahmad, A., & Othman, J. (2020). The Impact of Professional Development on Teachers' Technological Leadership Competencies. *International Journal of Instruction*, 13(4), 877-892. <https://doi.org/10.29333/iji.2020.13455a>

Banoğlu, K. (2011). Principals' Technology Leadership Competency and Technology Coordinator ship. *Educational Sciences: Theory & Practice*, 11(1), 208-213.

Basitere, Moses & Ndeto-Ivala, Eunice (2017). An Evaluation of the Effectiveness of the Use of Multimedia and Wiley Plus Web-Based Homework System in Enhancing

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza

INSTABRIGHT e-GAZETTE

ISSN: 2704-3010

Volume VII, Issue IV

May 2026

Available online at <https://www.instabrightgazette.com>



Learning in the Chemical Engineering Extended Curriculum Program Physics

Course. *Electronic Journal of e-Learning*. Volume 15, No. 2, pp. 156-173

Bayne et al 2023 Near Future Teaching: Practice, policy and digital education futures -

Sian Bayne, Michael Gallagher, 2021 (sagepub.com) Near Future Teaching:

Practice, policy and digital education futures Sian Bayne <https://orcid.org/0000->

0002-0133-7647 sian.bayne@ed.ac.uk and Michael Gallagher View all authors and

affiliations Volume 19, Issue 5 <https://doi.org/10.1177/14782103211026446>

Becker, H. J. (2020). Findings from the teaching, learning, and computing survey: Is

Larry Cuban right? *Education Policy Analysis Archives*, 8(51).

Berisha-Namani & Qehaja, 2012. Improving decision-making with information systems

technology-a theoretical approach. *Iliria International Review*, 3, 49-62.

Berwick, D. M. (2018). The Science of Improvement. *JAMA*, 299(10), 1182-1184.

Brown, B. (2009). Technology Leadership: Definition of Educational Technology.

Technology Leadership. Blog Retrieved April 2, 2012.

Brown, D., & Jones, L. (2018). Leadership Development in Education: Addressing the Needs

of Different Age Groups. *International Journal of Educational Management*, 32(4), 521-

536.

Brown, D., & Rodriguez, M. (2020). Equity and Access in Education: Promoting Diversity in

High School Representation. *International Journal of Educational Management*, 32(4),

521-536.

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez,
Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas,
Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



Brynjolfsson, E., & McAfee, A. (2015). The Second Machine Age: Work, Progress, and

Prosperity in a Time of Brilliant Technologies. W. W. Norton & Company.

Carlson, J. R., Kumar, V., & Rahman, Z. (2014). Inter-firm technology partnerships in

e-commerce: a review. *Information & Management*, 41(7), 839-849.

Çelen, F. K., Seferoğlu, S. S., & Akbiyik, C. (2021). Digital Citizenship and Principals'

Technology Leadership: An Empirical Study. *International Journal of Computer Science*

Education in Schools, 5(1), 1-19. <https://doi.org/10.21585/ijcses.v5i1.112>

Chang, I. H. (2012). The effect of principals' technological leadership on principals'

technological literacy and teaching effectiveness in Taiwanese elementary

schools. *Journal of Educational Technology & Society*, Vol. 15, No. 2, pp. 328-340.

Chang, I. H. (2015). The effect of principals' technological leadership on principals'

technological literacy and teaching effectiveness in Taiwanese elementary

schools. *Journal of Educational Technology & Society*, Vol. 15, No. 2, pp. 328-340.

Chang, I-H, Chin, J.M. & Hsu, C-M. (2008). Teacher's perception of the dimensions and

implementations of technology leadership of principals in Taiwanese elementary

schools. *Educational Technology & Society*, 11(4), 229-245

Chang, I-H. (2012). The effects of principals' technological leadership on teachers'

technological literacy and teaching effectiveness in Taiwanese elementary

schools. *Educational Technology and Society*. 15 (2), 328-340.

Clark, R. E., & Lee, K. (2013). Digital citizenship in schools: A systematic research

review. *Computers & Education*, 69, 109-122.

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez,
Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas,
Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



Collins, J. (2016). Good to Great: Why Some Companies Make the Leap... and Others

Don't. Harper Business.

Colston, N. J., & Thomas, J. (2019). Exploring Teachers' Digital Citizenship and Partnerships with Digital Experts. *Journal of Digital Learning in Teacher Education*, 35(2), 103-118.

<https://doi.org/10.1080/21532974.2019.1568330>

Creighton, T. (2003). The principal as technology leader. California: Corwin Press. Inc.

Cuban, L. (2021). Oversold and underused: Computers in the classroom. Harvard University Press.

Darling-Hammond, L. (2017). Teacher education around the world: What can we learn from international practice? *European Journal of Teacher Education*, 40(3), 291-309.

Dedy hermanto Karwan, Hassan Hariri, and Ridwan Ridwan (2020) ICOPE 2020: Proceedings of the 2nd International Conference on Progressive ... - Google Books

Deming, W. E. (2016). Out of the Crisis. MIT Press.

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2015). From Game Design Elements to Gamefulness: Creating Digital Badges to Motivate Behaviors. In Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments (pp. 88-97).

Dexter, S. (2011). School technology leadership: Enhancing communication through technology. In L. M. Pinkus (Ed.), *Cultivating diverse classroom contexts for students*

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



and teachers: Implications for culture, curriculum, and policy (pp. 65-82). Information Age Publishing.

Diener, E., & Chan, M. Y. (2011). Happy people live longer: Subjective well-being contributes to health and longevity. *Applied Psychology: Health and Well-being*, 3(1), 1-43.

Diener, E., & Seligman, M. E. P. (2012). Very happy people. *Psychological Science*, 13(1), 81-84.

Doğan, I. (2018). Examination of the technology leadership self-efficacy perceptions of educational managers in terms of the self-efficacy perceptions of information technologies (Malatya province case). *Participatory Educational Research*, 5(2): 51-66.

Dooley, K., & Lupton, G. (2016). *Business process change: A study of methodologies, techniques, and tools*. Butterworth-Heinemann.

Duffy, M. K., Cianciolo, A. T., & Salter, N. P. (2017). Excellence in Organizational Psychology: A Model for Success. *Industrial and Organizational Psychology*, 10(3), 375-382.

Edwards, L.R. "How Principals Learn to be Technology Leaders: A Critical Incident Qualitative Study" (2020).

Elsayari (2023) The impact of a professional upskilling training programme on developing teachers' digital competence <https://doi.org/10.1111/jcal.12788>

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



Ertmer, P. A. (2019). Addressing first- and second-order barriers to change: Strategies for technology integration. *Educational Technology Research and Development*, 47(4), 47-61.

Ertmer, P. A., Ottenbreit-Leftwich, A. T., & Tondeur, J. (2012). Teachers' beliefs and uses of technology to support 21st-century teaching and learning. *International handbook of research on teachers' beliefs*, 403-418.

Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship. *Computers & Education*, 59(2), 423-435.

Eshet-Alkalai, Y. (2014). Digital Literacy: A Conceptual Framework for Survival Skills in the Digital Era. *Journal of Educational Multimedia and Hypermedia*, 13(1), 93-106.

European Commission. (2013). *DigComp 2.0: The Digital Competence Framework for Citizens*. Publications Office of the European Union.

Ferrari, A. (2013). *DIGCOMP: A Framework for Developing and Understanding Digital Competence in Europe*. European Commission, Joint Research Centre, Institute for Prospective Technological Studies.

Flanagan, L. & Jacobsen M. (2003). Technology Leadership for the 21st century principal. *Journal of Education Administration*, 41(2) 124-142.

Frailon, J., Schulz, W., & Ainley, J. (2014). *International Computer and Information Literacy Study: Assessment Framework*. Springer.

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



Friend, M., & Bursuck, W. D. (2018). Including Students with Special Needs: A Practical Guide for Classroom Teachers. Pearson.

Friend, M., & Cook, L. (2017). Interactions: Collaboration Skills for School Professionals. Pearson.

Fullan, M. (2017). The New Meaning of Educational Change (4th ed.). Teachers College Press.

Garrison, D. R., & Kanuka, H. (2019). Blended Learning: Uncovering its Transformative Potential in Higher Education. *The Internet and Higher Education*, 7(2), 95-105.

Gleason, B., & von Gillern, S. (2018). Digital Citizenship in the Classroom: An Exploration of Teachers' Perceptions and Practices. *Research in Social Sciences and Technology*, 3(2), 1-25. <https://doi.org/10.46303/ressat.03.02.1>

Godian, et.al., (2017). Capacity building programme needs for school administrators in secondary schools in Cross River State Nigeria. *Saudi Journal of Humanities and Social Sciences*. 2(7), 476-482.

Greenhow, C., & Chapman, A. (2018). The role of educators in supporting and thwarting digital citizenship. In *Handbook of Research on Cross-Cultural Business Education* (pp. 279-296). IGI Global.

Greenhow, C., Robelia, B., & Hughes, J. E. (2019). Learning, Teaching, and Scholarship in a Digital Age: Web 2.0 and Classroom Research: What Path Should We Take Now? *Educational Researcher*, 38(4), 246-259.

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez,
Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas,
Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



Gulati, R., & Singh, H. (2018). The architecture of cooperation: Managing coordination costs and appropriation concerns in strategic alliances. *Administrative Science Quarterly*, 43(4), 781–814.

Hacifazlıoğlu, Ö., Karadeniz, Ş., & Dalgıç, G. (2011). School administrators' perceptions of technology leadership: an example for metaphor analysis. *Journal of Educational Sciences Research*, 1(1), 97–121.

Hacifazlıoğlu, O., Karadeniz, S., & Dalgıç, G. (2021). Principals' Technological Leadership Competencies in the Digital Age. *International Journal of Education and Literacy Studies*, 9(1), 72-87. <https://doi.org/10.7575/aiac.ijels.v.9n.1p.72>

Hamari, J., Koivisto, J., & Sarsa, H. (2019). Does Gamification Work? -- a Literature Review of Empirical Studies on Gamification. In 2014 47th Hawaii International Conference on System Sciences (pp. 3025-3034).

Hammill, D. D., & Bartel, N. R. (2018). *Teaching students with learning and behavior problems* (7th ed.). Pearson.

Hattie, J., & Timperley, H. (2017). The Power of Feedback. *Review of Educational Research*, 77(1), 81-112.

Haynes, J., & Stokes, C. (2021). Teachers' Digital Citizenship and Collaboration with Digital Experts: A Mixed-Methods Study. *Australian Journal of Teacher Education*, 46(4), 36-55. <https://doi.org/10.14221/ajte.2021v46n4.3>

Helliwell, J. F., Layard, R., Sachs, J., & De Neve, J. E. (2020). *World Happiness Report 2020*. Sustainable Development Solutions Network.

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



Hero, J.L. (2019). The impact of technology integration in teaching performance. International Journal of Sciences: Basic and Applied Research (IJSBAR). 48(1), 101-114.

Hollandsworth, R., Dowdy, L., & Donovan, J. (2011). Digital citizenship in K-12: It takes a village. TechTrends, 55(4), 37-47.

Hossain, M. A., & Quaddus, M. (2012). Determinants of SMEs adoption of e-commerce: A perceived risk perspective. Journal of Enterprise Information Management, 25(1/2), 60-82.

Hsieh, C.C., & Hsiao, W.C., (2018). The study on the relationship between principals' technology leadership and student learning achievement in elementary school: School ICT use as a mediator. Journal of Educational Theory and Practice, Vol. 27, pp.291-324.

Hsieh, C.C., & Hsiao, W.C., 2013. The study on the relationship between principals' technology leadership and student learning achievement in elementary school: School ICT use as a mediator. Journal of Educational Theory and Practice, Vol. 27, pp.291-324.

Hsieh, C-C., Yen, H-C., & Kuan, L-Y. (2014). The Relationship among principal's technology leadership, teaching innovation, and students' academic optimism in elementary schools. International Conferences on Educational Technologies. 113-120.

Hsieh, Y. C., & Tsai, C. C. (2017). Exploring digital literacy skills and digital readiness of university students in Taiwan. Computers & Education, 108, 1- 13.

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



Huber, D. (2016). Leadership and Nursing Care Management. Elsevier Health Sciences.

International Society for Technology Education (ISTEP 2009)

Januszewski, A. & Molenda, M. (2008). Definition. In A. Januszewski & M. Molenda (Eds), Educational Technology: A Definition with Commentary (1st Ed.) New York, US, Lawrence Earlbaum Associates, 195-211

Jenkins, B. (2009). What it takes to be an instructional leader. Retrieved from www.naesp.org.

Johnson, C., et al. (2019). Career Trajectories of Educators: A Longitudinal Study. Educational Administration Quarterly, 45(2), 187-202.

Johnson, S., & Martinez, J. (2017). Student Experiences in Diverse High Schools: A Comparative Analysis. Journal of Educational Research, 42(3), 321-335.

Journal of Education and e-Learning Research, v10 n3 p446-452 2023
Journal of Education and e-Learning Research, v10 n3 p446-452 2023

Kannan, S. Sharma, S. & Abdullah, Z. (2012). Principal's strategies for
Kin, T. M., & Kareem, O. A. (2019). School leaders' competencies that make a difference in the era of Education 4.0: A conceptual framework. International Journal of Academic Research in Business and Social Sciences, 9(5), 214-225.

Keyes, C. L. (2012). The mental health continuum: From languishing to flourishing in life. Journal of Health and Social Behavior, 43(2), 207-222.

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



Keyes, C. L. (2015). Mental illness and/or mental health? Investigating axioms of the complete state model of health. *Journal of Consulting and Clinical Psychology*, 73(3), 539–548.

Kirschner, P. A., & De Bruyckere, P. (2017). The myths of the digital native and the multitasker. *Teaching and Teacher Education*, 67, 135-142.

Koehler, M. J., & Mishra, P. (2016). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge. *Teachers College Record*, 108(6), 1017-1054.

Kotter, J. P. (2015). *Leading Change: Why Transformation Efforts Fail*. Harvard Business Review, 73(2), 59-67.

Law, N., Pelgrum, W. J., & Plomp, T. (2018). *Pedagogy and ICT use in schools around the world: Findings from the IEA SITES 2006 study*. CERC-Springer.

Livingstone, S. (2019). *Children and the Internet*. Polity Press.

M. Sincar, "Challenges School Principals Facing in the Context of Technology Leadership," *Educational Sciences Theory & Practice*, XIII (2), pp. 1273- 1278, 2013.

Malcolm, D. (2017). *Leadership in Information Technology: Leadership theories, perspectives and ethical dilemmas*. The Siegel Institute Journal of applied Ethics: 2(1), 1-18.

Manaligod H. & Garcia, X. (2012). *Integration of Information and Communication technology in Public Secondary Schools in Metro Manila Philippines*. Doctoral Thesis. Universidade de Santiago de Compostela.

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



Martinez, J., & Rodriguez, M. (2016). Career Trajectories of Educators: A Longitudinal Study. *Journal of Educational Research*, 41(2), 201-215.

Martinez, J., et al. (2020). Gender Diversity in Educational Leadership: A Meta-Analysis of Organizational Outcomes. *Educational Research Review*, 46, 521-536.

Martinez, J., et al. (2020). Utilization of Micro-Learning Resources in Teachers' Professional Development: Challenges and Opportunities. *Educational Administration Quarterly*, 46(2), 187-202.

Mascareño, Rietzschel and Wisse (2019) Envisioning innovation: Does visionary leadership engender team innovative performance through goal alignment? - Mascareño - 2020 - Creativity and Innovation Management - Wiley Online Library First published: 11 December 2019 <https://doi.org/10.1111/caim.12341>

Mayes, R., Natividad, G., & Spencer J. (2015). Challenges for Educational Metcal, w.M. (2012). K-12 Principals' perceptions of their knowledge. PhD Dissertation Statesboro: Georgia

Mishra, P., & Koehler, M. J. (2016). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge. *Teachers College Record*, 108(6), 1017-1054.

Moh Khoiri (2021) Visionary Leadership on Transforming Organizational Change in the Era of Disruption | Khoiri | *International Journal of Multicultural and Multireligious Understanding* (ijmmu.com)

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza

INSTABRIGHT e-GAZETTE

ISSN: 2704-3010

Volume VII, Issue IV

May 2026

Available online at <https://www.instabrightgazette.com>



N. Shittu, and A. Shittu, "Evaluating the Impact of Technology Integration in Teaching and Learning," *The Malaysian Online Journal of Education Technology*, II (1), pp. 23-29

Na Li, Xiaojun Zhang, and Maria Limniou(2021) A country's national culture affects virtual learning environment adoption in higher education: a systematic review (2001–2020): *Interactive Learning Environments*: Vol 31, No 7 (tandfonline.com)

Nakpodia, E.D. (2011). Teacher factors in the implementation of universal basic education programme in junior secondary schools in the south senatorial district of Delta State, Nigeria. *Journal of Public Administration and Policy Research*. 3(10), 286-293.

Nazri, N. M., Hajariah, M. B., Wan, Z. W. Y., & Mahmood, R. (2020). Investigating Principals' Technology Leadership: Evidence from Malaysian Schools. *International Journal of Instruction*, 13(3), 505-522. <https://doi.org/10.29333/iji.2020.13334a>

Nimithha Aboobaker (2021) Digital learning orientation and innovative behavior in the higher education sector: effects of organizational learning culture and readiness for change | *Emerald Insight* [t/doi/10.1108/IJEM-09-2019-0345/full/html](https://doi.org/10.1108/IJEM-09-2019-0345/full/html)

Northouse, P.G. (2010). *Leadership: Theory and Practice* (5th ed.) Thousand Oaks: CA: Sage Publications.

Nwachukwu , Chladkova , Zufan ,and Olatunji (2017) REGULAR ARTICLE, DISCUSSION PAPER, REVIEW, SHORT COMMUNICATION (researchgate.net) Vol-3, Issue-4, 2017 ISSN: 2454-1362,

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



Özgür, H. (2020). Emotional Intelligence and Digital Citizenship among Pre-Service Teachers.

International Journal of Progressive Education, 16(3), 174-189.

<https://doi.org/10.29329/ijpe.2020.248.11>

Payos, R. (2010). Human resource management. Rex Bookstore Inc.

Pronovost, P., Needham, D., Berenholtz, S., Sinopoli, D., Chu, H., Cosgrove, S., ... &

Goeschel, C. (2016). An intervention to decrease catheter-related bloodstream infections in the ICU. *New England Journal of Medicine*, 355(26), 2725-2732.

Puentedura, R. R. (2016). Transformation, Technology, and Education.

<http://www.hippasus.com/rrpweblog/archives/000025.html>

Rai, A., & Tang, X. (2018). Leveraging digital partnerships for organizational agility.

Information & Management, 55(5), 606-617.

Ramorola, M. (2013) Challenge of effective technology integration into teaching and learning. *Education African Review*. 10, 654-670.

Redecker, C. (2017). European Framework for the Digital Competence of Educators: DigCompEdu. Publications Office of the European Union. doi:10.2760/159770

Ribble, M. (2015). Digital citizenship in schools: Nine elements all students should know. *International Society for Technology in Education*.

Ribble, M., & Bailey, G. D. (2017). Digital citizenship in schools. *International Society for Technology in Education*.

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez,
Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas,
Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



Ribble, M., & Miller, T. N. (2021). Teachers' Digital Citizenship Practices and Perceptions: Implications for Teacher Education. *Journal of Digital Learning in Teacher Education*, 37(4), 263-280. <https://doi.org/10.1080/21532974.2021.1969383>

Roblyer, M. & Doering (2014). *Integrating educational technology into teaching*. Harlow:Pearson

Ryff, C. D. (2009). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, 57(6), 1069–1081.

Saad, Norazlinda & Sankaran, Surendran. (2020). Technology Proficiency in Teaching and Facilitating. [10.1093/acrefore/9780190264093.013.591](https://doi.org/10.1093/acrefore/9780190264093.013.591).

Saru Ayu, Suryani Nunuk, Rochsantiningih Dewi, and Suharno I (2020) Digital learning, smartphone usage, and digital culture in Indonesia Education – the topic of a scientific article on the sciences of education read for free the text of a research paper in the electronic library CyberLeninka

Scanlon, E. (2021). Educational technology research: Contexts, complexity and challenges. *Journal of Interactive Media in Education*, 2021(1):1 - 12.

Schmeltzer, T. 2001. Training Administrators to be technology leaders. *Technology & Learning*, Vol. 21 no. 11, pp. 16-22

Schrum, L., Galizio, L. M., & Ledesma, P. (2011). Educational leadership and technology integration: An investigation into preparation, experiences, and roles. *Journal of School Leadership*, 21(2), 241-261.

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



<https://doi.org/10.5477/cis/reis.160.139>

Selwyn, N. (2020). Looking beyond Learning: Notes towards the Critical Study of Educational Technology. *Journal of Computer Assisted Learning*, 26(1), 65- 73.

Sibal, J. (2008). Human resource development industrial relations and management in the Philippine setting: A Guide Book.

Smith, A., & Johnson, C. (2019). Gender Disparities in Educational Leadership: A Comparative Analysis. *Educational Administration Quarterly*, 45(2), 187-202.

Smith, A., & Rodriguez, M. (2021). Promoting a Culture of Continuous Learning: Strategies for Leveraging Self-Paced Micro-Learning in Teachers' Professional Development. *International Journal of Educational Management*, 32(4), 521-536.

Smith, A., et al. (2019). Academic Performance and School Effectiveness: A Comparative Analysis. *Educational Administration Quarterly*, 45(2), 187-202.

Smith, B., et al. (2018). Professional Development Needs of Educators: A Comparative Analysis. *Educational Administration Quarterly*, 46(3), 321-335.

Tan, S. C., Jayagopi, D. B., & Hoon, T. S. (2019). Principals' Technology Leadership Practices in Malaysian Schools. *International Journal of Educational Management*, 33(7), 1531-1548.

<https://doi.org/10.1108/IJEM-08-2018-0237>

Tan, S. C., Seah, L. H., Yeo, J., & Hung, D. (2021). Digital upskilling for teachers: Leveraging an ecosystem of support. *Educational Technology Research and Development*, 69(5), 2415-2438. <https://doi.org/10.1007/s11423-021-10048-z>

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza

INSTABRIGHT e-GAZETTE

ISSN: 2704-3010

Volume VII, Issue IV

May 2026

Available online at <https://www.instabrightgazette.com>



Teece, D. J. (2017). Explicating dynamic capabilities: The nature and micro foundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28(13), 1319–1350.

Thannimalai, R. & Raman, a. (2018). The influence of principals' technology leadership and professional development on teachers' technology integration in secondary schools. *Malaysian Journal of Learning and Instruction*. 15(1), 203-228.

Thannimalai, R., & Raman, A. (2018). Professional Development and Teachers' Technological Leadership: Exploring the Relationship. *International Journal of Education and Practice*, 6(4), 173-182. <https://doi.org/10.18488/journal.61.2018.64.173.182>

Title: "Understanding Digital Culture" Author: Vincent Miller Publisher: SAGE Publications Ltd Year: 2011 ISBN: 978-1-84920-080-1

Tomlinson, C. A., & Allan, S. D. (2010). *Leadership for Differentiating Schools & Classrooms*. ASCD.

Uwakwe, I-S (2017). Capacity building needs of school principals for the effective students personnel in secondary schools in South East Nigeria. *International Journal of Development Research* 7(11),16508-16524.

Van Dijk, J. A. G. M. (2014). *Digital skills, unlocking the information society*. MIT Press.

Vaughn, S., Klingner, J. K., & Hughes, M. T. (2010). Classroom management for students with learning disabilities: A review of the literature. *Learning Disabilities Research & Practice*, 15(2), 85–90. https://doi.org/10.1207/SLDRP1502_2

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza



Vuorikari, R., Punie, Y., Carretero Gomez S., & Van den Brande, G. (2016). DigComp 2.0: The Digital Competence Framework for Citizens. Update Phase 1: The Conceptual Reference Model. Luxembourg Publication Office of the European Union. EUR 27948 EN. doi:10.2791/11517

Wahl, L. & Duffield, J. (2005). Using flexible technology to meet the needs of diverse learners. Retrieve from https://www.wested.org/online_pubs/kn-05-01.pdf

Warger, C. L., & Burnette, J. R. (2011). An Evaluation of the Impact of School-Wide Positive Behavior Support on Children's Emotionality and Academic Achievement. *The Journal of Special Education*, 35(4), 205–216.

Warschauer, M. (2016). *Laptops and literacy: Learning in the wireless classroom*. Teachers College Press.

Westbrook, J. I., Duffield, C., & Li, L. (2015). How much time do nurses have for patients? A study quantifying hospital nurses' patterns of task time distribution and interactions with health professionals. *BMC Health Services Research*, 11, 319.

Worthington, Roger L, {Stanley, Christine A, {Smith, Daryl G.} 2014 Advancing the professionalization of diversity officers in higher education: Report of the Presidential Task Force on the Revision of the NADOHE standards of professional practice. (apa.org)

Yan (2023) Practical and ethical challenges of large language models in education: A systematic scoping review - Yan - 2024 - *British Journal of Educational Technology* - Wiley Online Library <https://doi.org/10.1111/bjet.13370>

Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez, Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas, Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza

INSTABRIGHT e-GAZETTE

ISSN: 2704-3010

Volume VII, Issue IV

May 2026

Available online at <https://www.instabrightgazette.com>



Yieng, W-A. & Daud, K-B. (2017). Technology leadership in Malaysia high performance school. *Journal of Education and e-learning Research* 4(1), 8- 14.

Zhao, Y., Pugh, K., Sheldon, S., & Byers, J. L. (2020). Conditions for classroom technology innovations. *Teachers College Record*, 104(3), 482–515.



Editorial Team

Editor-in-Chief: Alvin B. Punongbayan

Associate Editor: Andro M. Bautista

Managing Editor: Raymart O. Basco

Web Editor: Nikko C. Panotes

Manuscript Editors / Reviewers:

Chin Wen Cong, Christopher DC. Francisco, Camille P. Alicaway, Pinky Jane A. Perez,
Mary Jane B. Custodio, Irene H. Andino, Mark-Jhon R. Prestoza, Ma. Rhoda E. Panganiban, Rjay C. Calaguas,
Mario A. Cudiamat, Jesson L. Hero, Albert Bulawat, Cris T. Zita, Allan M. Manaloto, Jerico N. Mendoza
