

Educational Transformation: Evaluating the Impact and Challenges of Digital Pedagogical Strategies

Lailanie A. Belesario^a, Delon A. Ching, EdD^{b*}

^a *lailanie.araojo@deped.gov.ph*

^a *Teacher II, Ibabang Talim Elementary School, Lucena City, Quezon 4301, Philippines*

^b *Associate Professor V, Laguna State Polytechnic University, San Pablo City, Laguna 4000 Philippines*

Abstract

This study evaluated the impact and challenges of digital pedagogical strategies among senior teachers through an in-depth interview. Using qualitative research design, data was gathered from 12 respondents in the Division of Lucena City via one-on-one interview. Six methodical processes were followed in the process: (1) collecting the data; (2) creating preliminary codes and clustering them; (3) categorizing them to create themes; (4) evaluating themes; (5) defining and labeling themes; and (6) analyzing and interpreting. Findings revealed that senior teachers described digital pedagogy as a vital approach in modern education that leverages technology to improve teaching and learning across multiple modes, including online, hybrid, and face-to-face settings. The key digital competencies of senior teachers include seven categories such as commonly used platforms, online behavior and communication, challenges and willingness to learn, lesson planning and preparedness, teaching strategies and student engagement, digital tools for teaching and assessment, and digital literacy and resource utilization. Moreover, these digital competencies also highlight the following: digital literacy and competence, professional development and training, use of digital tools in teaching, classroom adaptation and teaching strategies, adaptability and readiness for change and challenges in digital learning and teaching. The most common challenges encountered by senior teachers in using digital tools, and how they manage those, are as follows: internet and technical challenges, student engagement and learning challenges, teacher preparedness and training, teaching strategies and resource integration, collaboration and peer support, flexibility and adaptation in teaching, and digital resource utilization. Thus, digital pedagogy plays a crucial role in modern education by integrating technology into enhanced teaching and learning across various settings. It fosters better engagement, collaboration, and accessibility while aligning with contemporary advancements.

Keywords: senior teacher; digital pedagogy; digital competencies

1. Introduction

According to Haleem et.al (2022) digital technology has emerged as a critical instrument for accomplishing goals in education. The integration of digital pedagogical strategies has reshaped modern education, offering new opportunities for teaching and learning. The digital world creates numerous obstacles for teachers in the classroom. The education industry has seen a paradigm shift as a result of these digital

tools. It serves as a mentor, assessor, and co-creator of information in addition to providing knowledge. Technological advancements in education have made life easier for learners.

With the increasing use of digital tools in teaching and learning in this century, it's critical to understand how experienced teachers adapt to these changes. According to Estrellado (2022) the emergence of digital technology has revolutionized education, creating new opportunities for instruction and learning. As schools and universities adopt digital pedagogical practices, educators, particularly senior teachers who have based their careers on traditional teaching methods, face a challenging transition. While the benefits of digital pedagogy are significant, such as increased learning flexibility and access to educational resources, tenure teachers confront distinct hurdles when implementing these tactics into their practice.

Education has undergone radical changes that have redefined pedagogy, welcomed technology, and placed a higher priority on students' overall development. These changes have left education at a crossroads. The evolution of online and hybrid learning environments, along with the reorganization of conventional classrooms, highlights how flexible and resilient education is in the face of novel obstacles. Digital era has altered the landscape of education in unimaginable ways. Both teachers and students have been pushed to adjust to this trend, teachers confront new problems and opportunities especially the tenure teachers, nonetheless, the challenges of re-adapting educational landscapes continue to emerge and need to be addressed.

According to Cox, et. al (2013) Many educators are looking for ways to improve educational resources and how they are administered to help schools improve. Teachers and technology are commonly regarded as the two most important teaching resources in schools today.

One of the most difficult obstacles is incorporating technology into the classroom and educating students to critically digest digital information. Teachers also struggle to acquire excellent resources and have a lack of competency in using digital media. In addition, limitations such as a lack of finances, time, access, and technical support impede the incorporation of technology into teaching and learning. Despite these limitations, teachers are eager to adapt and use a variety of technological devices and programs in their classes. To engage students and meet learning objectives, teachers must offer digital learning in an active, creative, and cautious manner.

One of the primary challenges senior teachers faces is the lack of technological proficiency. For teachers who have spent decades mastering conventional instructional methods, the rapid development of educational technologies can be overwhelming. Many senior teachers may not have been exposed to digital tools during their initial training or early career, leading to a steep learning curve when incorporating them into the classroom.

In this light, the researcher saw the importance of evaluating the impact and challenges of digital pedagogical strategies among senior teachers. Moreover, in today's result driven society, teachers have undeniable responsibility of recognizing and attending to the problems of learners especially that we are now in digital age. Furthermore, it is the perfect time to evaluate and assess the digital pedagogical strategies. A professional development program that helps teachers become more skilled and confident in their use of new pedagogical tools can be designed with the help of the evaluation of the methods, which offers insights into the areas where teachers require additional training and support. The researcher decided to analyze the status of the digital pedagogical strategies post pandemic that will serve as a basis in crafting an INSET Program.

1.1. Statement of the Problem

1. What is the description of digital pedagogy among senior teachers?
2. What are the key digital competencies of senior teachers?

3. What are the most common challenges encountered by senior teachers in using digital, and how do they manage those?

1. Methodology

The study utilized qualitative research design. It is qualitative, as it utilizes questionnaires to gather feedback in evaluating the impact and challenges of digital pedagogical strategies among senior -track teachers. Techniques such as structured interviews were used to gather qualitative data. With the help of a qualitative research design, the study aims to locate and understand the experiences, outlooks, and interpretations of senior teachers who are concerned with the use and integration of digital tools in education. The study does not have a scope for measuring the results in numerical terms, but an in-depth understanding is achieved through the teachers' beliefs, experiences, challenges, strategies, and views. The method is the most appropriate for understanding an aspect when such phenomena are far too complex and cannot be quantified, such as teaching practices and attitudes towards technology, or professional experiences. The researcher conducted the study in public elementary schools in the Division of Lucena. The researcher chose teacher-respondents based on their expertise and experience in using digital pedagogical strategies. There were twelve (12) purposely selected senior teachers. This sampling technique was employed in the selection of twelve (12) senior teacher-respondents who had knowledge and experience in digital pedagogy. By deliberately choosing individuals with relevant experience and expertise in digital pedagogy, the purposive sampling method enabled the provision of rich, meaningful insights that participants could derive from their extensive teaching experience and years of integrating technology. The selection of teachers with varying lengths of service, yet similar ages, aimed to provide further comparison and insight into how digital strategies are understood and applied across different levels of professional experience. The respondents were categorized into two (2) sets; six (6) teachers who are fifty (50) years old and twenty-five (25) years in service and above, and six (6) teachers who are fifty (50) years old and twenty-four (24) years in service and below. Essential to this study were the responses from the interview questionnaire, which described the impact and challenges of digital pedagogical strategies among tenure teachers in the Division of Lucena. A proposed INSET Program was developed as the output of the study. The researcher selected twelve (12) elementary senior teachers who were qualified to describe the respondents from the schools in the Division of Lucena. The participants were selected purposely since they were chosen based on identified criteria. The teachers were selected based on their age and years of service, specifically those who were fifty (50) years old and had served as elementary teachers at their respective schools. Two requirements for teachers selected for this study were age and years of experience, as experience and familiarity with traditional teaching practices provide a clear picture of how their perspectives on using digital media for instruction might be shaped. Having spent a great deal of time as educators themselves, their insights could help shed light on how, over many years of teaching experience, technology is integrating into changing educational contexts. The researcher employed purposive sampling to select the respondents for this study. All the elementary teachers from schools in the Lucena Division were chosen. The study employed research instruments that yielded valid and dependable data and discussions, which were crucial for achieving the desired objectives. The research-design questionnaire was used in this study, following the interviews and after reviewing pertinent literature. Thematic analysis was used to examine the verbatim transcriptions of every interview recording. Six methodical processes were followed in the process: (1) collecting the data; (2) creating preliminary codes and clustering them; (3) categorizing them to create themes; (4) evaluating themes; (5) defining and labeling themes; and (6) analyzing and interpreting. To find recurring themes and significant findings, the researcher closely analyzed the responses.

2. Results and Discussion

Table 1. List of Participants

Participants	Gender	Age	Years In Service	Elementary/ Secondary	School
Teacher A	Female	60	28	Elementary	Isabang Elementary School
Teacher B	Female	51	28	Elementary	Isabang Elementary School
Teacher C	Female	52	26	Elementary	West 1 Elementary School
Teacher D	Female	53	30	Elementary	West 1 Elementary School
Teacher E	Female	63	36	Elementary	Isabang Elementary School
Teacher F	Female	51	28	Elementary	Isabang Elementary School
Teacher G	Female	50	24	Elementary	West 1 Elementary School
Teacher H	Male	51	16	Elementary	Isabang Elementary School
Teacher I	Female	53	20	Elementary	Isabang Elementary School
Teacher J	Female	60	24	Elementary	West 1 Elementary School
Teacher K	Female	57	24	Elementary	West 1 Elementary School
Teacher L	Female	55	23	Elementary	West 1 Elementary School

One significant aspect in the study is the number of years that the teachers have been employed and served in a public institution. Fifty percent of the respondents have served 25 years or more, and the other fifty percent of the respondents have worked for the school for less than 25 years, as indicated in Table I. Therefore, these senior teachers are truly dedicated to serving and remaining committed, despite the challenges and changes they encounter in the digital era of education.

Senior teachers view technology integration as beneficial since it enhances their abilities and flexibility to technological changes, allowing them to manage and maintain hope despite their tenure, according to Pedida (2023). This suggests that ongoing professional development is crucial for enhancing senior teachers' abilities and integrating technology into classroom instruction.

The first theme discussed the description of digital pedagogy among senior teachers as interviewed by the researchers in schools within the Division of Lucena. Gorder (2008) asserts that qualitative research on teachers' experiences integrating technology offers deep insights into the process of transforming educators from technology operators to facilitators and integrators. Expanding research opportunities on technology integration is crucial for keeping pace with its increasing significance in effective school reform and student development.

Table 2. Description of digital pedagogy among senior teachers.

EMERGING THEMES	RESPONSES
Integration of Technology in Teaching and Learning	Technology Integration in Teaching (8) Digital Teaching Strategies & Resources (10) Enhancing Teaching Efficiency & Engagement (7)
Digital Tools and Platforms	Google Tools for Education (10) Assessment & Quizzing Tools (11) Learning Management & Collaboration (8) Creative & Multimedia Learning (7) Interactive & Adaptive Learning (10)

Student Engagement and Interactive Learning	Engaging Learning Strategies (9)
	Game-Based & Interactive Learning (8)
	Visual & Experiential Learning (8)
	Enhancing Educational Experiences (7)
Challenges in Digital Learning	Digital Divide and Accessibility Issues (12)
	Distractions and Negative Effects of Technology (8)
	Adaptation and Learning Curve (5)
Teacher Development and Training	Professional Development & Training (12)
	Collaborative Learning & Support (10)
	Teaching Strategies & Efficiency (10)
Benefits of Digital Teaching	Efficiency & Workload Management (10)
	Assessment & Feedback (9)
	Engagement & Learning Experience (8)

Based on the responses of the senior teachers, six emerging themes have been identified regarding the description of digital pedagogy. These include the integration of technology in teaching and learning, the use of digital tools and platforms, student engagement, and interactive learning, as well as challenges in digital learning, teacher development, and training.

Teachers said that integrating technology is very evident in digital pedagogy for the teaching and learning process. It is very important to integrate technology because it is a tool that transforms the teaching and learning process, and this has become a practice to support and enhance learning. If there is an integration, this follows a digital adaptation where teachers, even if they are senior, would adapt. Another category that falls under this integration is digital teaching strategies and resources, which include 21st-century teaching strategies, digital teaching resources, online, hybrid, and face-to-face learning, online activities and quizzes, and incorporating multimedia resources. Lastly, this involves enhancing teaching efficiency and engagement. Based on the results of their answers and their experience, technology improves teaching efficiency through the use of interactive simulations.

Based on Väättäjä's (2022) study, the strategies employed to encourage students' learning are referred to as pedagogical practices, which include social knowledge creation and teamwork, among others. Lastly, high self-efficacy and excellent peer collaboration abilities, in addition to technological, pedagogical, and content understanding, enhance instructors' ability to integrate digital tools into their instruction.

Teachers also use Google Classroom, Google Slides, Google Sheets, Google Forms, Google Docs, and Google Drive for lesson planning and student tracking. These are some of the Google tools for education. On the other hand, Kahoot, Quizlet, and Zipgrade are the tools used by teachers when it comes to assessment and quizzes. It is also significant for teachers to have access to learning management systems and collaboration tools, which they utilize through LMS, interactive whiteboards, and online collaborative platforms. Canva, digital storytelling and movie integration in learning are also used for creative and multimedia learning. For adaptive learning, this includes interactive learning, such as presentations and PowerPoint presentations.

There are numerous opportunities for student engagement and interactive learning. Aside from those mentioned above, teachers employ engaging learning strategies, including active learning, student-centered activities, hands-on experiences, peer teaching, and collaborative learning. Game-based Learning also plays a vital role in student engagement. There are games for learning, such as Kahoot, as well as puzzles and

interactive activities that incorporate gamification. Students today are very visual; that is why they learn more through experiential learning. Teachers integrate movies into learning. They employ exploration-based learning, the show-don't-tell method, and the demonstration method.

Challenges are always part of the teaching and learning process. In this digital learning, senior teachers encounter a lot, and this also defines what digital learning is. They stated that there are digital division and accessibility issues, such as limited internet access and device availability, as the majority of students lack internet access and don't even have cellphones. There are also distractions and negative effects of technology. Students get distracted by Minecraft, Facebook, Messenger, or TikTok. There is a need for teacher monitoring. Students are overusing gadgets, which affects their reading habits. The worst-case scenario is overreliance on AI tools like ChatGPT. Although digital technology is helpful, there are still numerous negative effects associated with excessive technology use.

Teachers also believe that digital pedagogy involves teacher development and training. Teachers acknowledged that professional development and training are essential to this kind of pedagogy, including INSET (In-Service Training), LAC (Learning Action Cell) sessions, Online courses, webinars, and training that will help teachers adapt to digital technologies and new teaching strategies. This also includes collaborative learning and support, wherein they learn from colleagues, ask for help from co-teachers, collaborate with them, or engage in intergenerational learning.

Lastly, there are the benefits they gain from digital teaching. Based on the responses of these teachers, efficiency and workload management make teaching easier and more efficient, tasks and workload are lighter, and instruction is simplified, with improved ability to manage student work. Digital technology also enables the management of assessment and feedback, providing detailed analytics reports and facilitating student progress tracking.

Mo's (2024) study found that incorporating digital pedagogy, especially with digital storytelling tools, creates engaging stories and improves relationships between teachers and students. The study also highlights the importance of strong digital infrastructure and institutional support in integrating digital pedagogy into teacher preparation programs. The findings highlight how digital tools can be utilized to create a dynamic and successful teacher training paradigm that adapts to the evolving educational landscape.

Table 3. Key digital competencies of senior teachers.

EMERGING THEMES	RESPONSES
Digital Literacy and Competence	Digital Literacy & Competency (8) Information Literacy & Management (8) Digital Communication & Content Creation (9) Online Safety & Responsible Use (10)
Professional Development and Training	Professional Development & Training (12) Self-Directed & Collaborative Learning (6) Adaptability & Innovation (11)
Use of Digital Tools in Teaching	Productivity & Collaboration Tools (8) Presentation & Instructional Tools (10) Interactive & Engaging Learning Tools (10)
Classroom Adaptation and Teaching Strategies	Classroom Management & Teaching Modalities (8) Student Engagement & Interactive Learning (12) Reinforcement & Concept Mastery (10) Learning Strategies & Skill Development (7)

Adaptability and Readiness for Change	Adaptability & Openness to Change (12)
	Preparation & Readiness (10)
	Technology & Education Integration (10)
Challenges in Digital Learning and Teaching	Technical Challenges & Digital Skills Gaps (9)
	Lack of familiarity with new tech tools (10)
	Adaptation & Change Struggles (9)
	Fear & Connectivity Issues (10)

From the responses of the teachers when it comes to digital competencies, there are six emerging themes resulted: digital literacy and competence, professional development and training, use of digital tools in teaching, classroom adaptation and Teaching strategies, adaptability and readiness for change and the challenges in digital learning and teaching.

Digital literacy encompasses skills in the effective use of technology, including both basic and advanced computer skills. Teachers are digitally competent. Information literacy encompasses the ability to search, evaluate, and organize digital information effectively. They already know how information literacy and management work. Digital communication and content creation skills are essential for problem-solving and utilizing various software packages. Content creation is becoming a trend. There is an effective use of technology. Responsible online behavior also guarantees the safety and ethical use of digital resources, which students and teachers can observe.

One of the new trends is the professional growth of teachers, which includes ongoing study through seminars, workshops, and training, especially in technology-augmented pedagogy. Teachers in the Department of Education get this INSET or In-Service Training. Teachers learn individually and in groups by testing new learning applications, consulting with colleagues, and drawing on past experiences. Cooperation with competent individuals is of great assistance in building teacher competence. Adaptability and creativity are key elements, demanding a willingness to change and excellent change management skills to achieve greater teaching efficacy.

The third evolving theme in digital literacy is the application of digital tools in instruction. Efficient instruction incorporates productivity, presentation, and interactive tools to boost learning. Applying digital tools such as Google Sheets, Docs, Classroom, and Forms simplifies organization and communication, which is greatly essential in this digital age, particularly during a pandemic where everything runs on technology. Presentation tools, such as PowerPoint and multimedia incorporation, enhance the delivery of instruction. Active learning experiences are encouraged through digital storytelling, interactive simulations, and online materials that align with educational objectives.

Successful teaching involves the integration of firm classroom management, interactive instruction, and reinforcement techniques that maximize student engagement and mastery to the greatest extent possible. This autumn, the fourth emerging theme concerns the adaptation of the classroom and teaching methods. Technology-enhanced instruction accommodates online, blended, and face-to-face instruction, and multimedia tools and hands-on tasks promote active engagement. The interactive class discussion and multimedia learning of the students also shared the same orientation on how competency is achieved. Concept mastery is augmented by post-video analysis, simulation, and complementary digital resources. Aside from those, learning tactics such as note-taking facilitate critical skills for profound understanding. Post-video analysis and simulation in science integration were also used to reinforce concepts that are synchronized with digital resources and learning objectives.

No one succeeds without being capable of adapting, particularly to changes. According to the feedback of the teachers, successful teaching demands adaptability, preparation, and smooth integration of technology. Teachers need to adopt digital learning, remain receptive to change, and continually seek out new tools. Particularly in the pandemic, where the new normal was suggested and enforced. Although not

everyone is digitally literate, everyone gets involved. Preparation and lifelong learning guarantee preparedness for instruction enhanced by technology. In a technology-driven society, staying updated with developments is crucial for incorporating contemporary technology into teaching. All need to be motivated to evolve with changes.

Lastly, for the digital key competence, there are challenges for these teachers. Teachers often face technical challenges, including difficulties with Excel, data calculations, and navigating new digital tools. Some individuals struggle to use digital tools optimally. Many teachers struggle with adapting to new technology, with some unwilling or unable to keep up until retirement. Adaptation and changes struggle badly. Not everybody can afford to have gadgets and internet access. Overcoming these barriers requires expert training, support, and increased access to technology.

Four components of digital competence, based on Ilomäki's (2016) study, are: technical skill, the ability to employ digital technologies effectively in work, education, and everyday life; the ability to critically evaluate digital technologies; and the motivation to become involved and commit oneself to digital culture. Pedagogical competences and technology are the most highlighted of the seven repeating dimensions of teachers' professional digital competence in Aberg's (2022) research: technological competence, content knowledge, attitudes towards using technology, pedagogical competence, cultural awareness, critical approach, and professional engagement. According to existing literature, it remains the responsibility of individual teachers to foster scientific competency. This suggests that school leadership at the organizational level is not responsible for ensuring that teachers have this kind of competency. Furthermore, to prepare students for an uncertain future, critical, scientific, and ethical competencies must evolve in tandem with society, as teachers' professional digital competence functions within the chronosystem and interacts with socio-historical and socio-technical changes over time.

Table 4. The most common challenges encountered by senior teachers in using digital tools and how they manage those.

EMERGING THEMES	RESPONSES
Internet and Technical Challenges	Network & Internet Issues: (12) Device Performance Issues: (12) Technical Troubleshooting & Digital Tools: (10)
Student Engagement and Learning Challenges	Student Engagement & Motivation: (8) Attention & Focus Issues: (8) Classroom Behavior & Management: (7)
Teacher Preparedness and Training	Skill Development & Learning Strategies: (9) Support & Collaboration: (12) Challenges in Digital Adaptation: (10) Mindset & Confidence Building: (12)
Teaching Strategies and Resource Integration	Backup Strategies for Digital Failures: (12) Supplementary Teaching Resources: (8) Digital & Multimedia Integration: (12) Interactive & Active Learning Strategies: (12)
Collaboration and Peer Support	Collaborative & Peer Learning: (12) Workplace Support & Tech Assistance: (10)

Flexibility and Adaptation in Teaching	Blended Teaching Approaches: (7) Adaptive Teaching Strategies: (10) Technology & Accessibility in Education: (12)
Digital Resource Utilization	Digital Resource Utilization (12)

3. Recommendations

Based on the conclusions drawn, several recommendations are offered to enhance digital pedagogy among senior teachers. First, the school administration may be provided with the study's results to help them identify and implement solutions to the challenges encountered in using digital tools. Curriculum implementers and policymakers are encouraged to evaluate the current status of both teachers and students to determine appropriate interventions that will further enhance instructional practices through technology. Teachers are also encouraged to build their capacity and confidence in integrating technology into their teaching strategies to meet the needs of their students better. Furthermore, future studies related to this topic may be conducted to validate the findings and strengthen the reliability of the current research. Lastly, it is recommended that future research incorporates classroom observations and interviews, involving senior teachers and researchers, to gain deeper insights.

References

- Aithal, P. S. and Aithal, Shubhrajyotsna, How to Empower Educators through Digital Pedagogies and Faculty Development Strategies (December 16, 2023). International Journal of Applied Engineering and Management Letters (IJAEML), 7(4), 139-183. (2023), Available at SSRN: <https://ssrn.com/abstract=4674876> or <http://dx.doi.org/10.2139/ssrn.4674876>
- Aggabao, B. A., Aggabao, N. T., Antiado, D. F., & Castillo, F. G. (2018)
- Al-Samarraie, H., & Saeed, N. (2018). A systematic review of cloud computing tools for collaborative learning: Opportunities and challenges. *Computers & Education*, 124, 77–91.
- Al-Shuaibi, A. (2014). Research Gate. The Importance of Education. Retrieved June 17, 2024, from https://www.researchgate.net/publication/260075970_The_Importance_of_Education
- Atmojo, I. R. W., Ardiansyah, R., & Wulandari, W. (2022). Classroom Teacher's Digital Literacy Level based on Instant Digital Competence Assessment (IDCA) Perspective. *Mimbar Sekolah Dasar*, 9(3), 431–445. <https://doi.org/10.53400/mimbar-sd.v9i3.51957>
- Avalos, B. (2018). Teacher professional development in teaching and teacher education over the past ten years. *Teaching and Teacher Education*, 80, 1–7. <https://doi.org/10.1016/j.tate.2018.01.007>
- Aziz, A., & Butt, M. (2022, June 30). A Discipline-Wise Comparison of Challenges and Problems of Tenure-Track Teachers. <https://ojs.pssr.org.pk/journal/article/view/183>
- Barrot, J., Llenares, I. & del Rosario, L. (2021). Students' online learning challenges during the pandemic and how they cope with them: The case of the Philippines. Volume 26, pages 7321–7338,. Retrieved July 4, 2024 from <https://link.springer.com/article/10.1007/s10639-021-10589-x>
- Baxter, J., Floyd, A., & Jewitt, K. (2022) *British Educational Research Journal*. Pandemic, a catalyst

- for change: Strategic planning for digital education in English secondary schools, before during and post Covid. Retrieved June 17, 2024 from <https://bera-journals.onlinelibrary.wiley.com/doi/10.1002/berj.3845>
- Berstein (2022). Student Engagement: Why it Matters. Retrieved June 15, 2024, from <https://xello.world/en/blog/student-engagement/what-is-student-engagement/>
- Bitar, N., & Davidovich, N. (2024). Transforming Pedagogy: The Digital Revolution in Higher education. *Education Sciences*, 14(8), 811. <https://doi.org/10.3390/educsci14080811>
- Bozkurt, A., Jung, I., Xiao, J., Vladimirsch, V., Schuwer, R., Egorov, G., ... & Paskevicius, M. (2020). A global outlook to the interruption of education due to COVID-19 pandemic: Navigating in a time of uncertainty and crisis. *Asian Journal of Distance Education*, 15(1), 1-126. <https://doi.org/10.5281/zenodo.3878572>
- Cahate, F., Rodriguez, G. & Quines, L. (2022) Teachers' Teaching Efficiency during Pandemic: A Case Study. Ramon Magsaysay Memorial Colleges, Graduate School General Santos City, Philippines. Retrieved July 4, 2024 from <https://www.noveltyjournals.com/upload/paper/Teachers%E2%80%9920TeachingEfficiency-26042022-1.pdf>
- Castro, I.R. (2022). Research Gate. The Impacts of COVID-19 on the Current State of Education in the Philippines. Retrieved June 17, 2024 from https://www.researchgate.net/publication/358141893_The_Impacts_of_COVID-19_on_the_Current_State_of_Education_in_the_Philippines
- Charles, A. A. & Janardhanan, J. (2024). Impact Of Advanced Pedagogical Approaches on Student Performance in Higher Secondary Schools. *Educational Administration. Theories and Practices*. Retrieved June 24, 2024, from <https://kuey.net/index.php/kuey/article/view/2116>
- Chatterjee, R., Bandyopadhyay, A., Chakraborty, S., Dutta, S. (2023). Digital Education: The Basics with Slant to Digital Pedagogy-An Overview. In: Choudhury, ., Biswas, A., Chakraborti, S. (eds) *Digital Learning based Education. Advanced Technologies and Societal Change*. Springer, Singapore. https://doi.org/10.1007/978-981-19-8967-4_4
- Christensen, D. (2019). Classcraft. What does “technology integration” mean? Retrieved June 15, 2024, from <https://www.classcraft.com/blog/definition-of-technology-integration-in-education/>
- Chounta, I. A., Retalis, S., & Avouris, N. (2021). Adaptive learning in online environments: Recent trends and future directions. *Smart Learning Environments*, 8(1), 1–19.
- Condra, et.al (2022). Learning Flexibility and Innovation in the Post-Covid-19 Pandemic Era. Retrieved July 5, 2024 from https://www.researchgate.net/publication/362691004_Learning_Flexibility_and_Innovation_in_the_Post-Covid-19_Pandemic_Era/citation/download
- Cox, J. (2022) Why is Social-Emotional Learning Important Post-COVID? Retrieved July 4, 2024 from <https://www.graduateprogram.org/2022/07/importance-of-social-emotional-learning-post-covid/>
- Dancsa, Daniel & Štempeľová, Iveta & Takáč, Ondrej & Annuš, Norbert. (2023). Digital tools in education. *International Journal of Advanced Natural Sciences and Engineering Researches*. 7. 289-294. 10.59287/ijanser.717.

- Dayagbil FT, Palompon DR, Garcia LL, and Olvido MMJ (2021) Teaching and Learning Continuity Amid and Beyond the Pandemic. *Front. Educ.* 6:678692. doi: 10.3389/feduc.2021.678692
- Dede, C., Ketelhut, D. J., Whitehouse, P., Breit, L., & McCloskey, E. M. (2016). A research agenda for online teacher professional development. *Journal of Teacher Education*, 67(1), 9–20. <https://doi.org/10.1177/0022487115616911>
- Downs, J., (2016). Exploring blended learning: A case study of adult learners using a learning management system in face-to-face classes. [Doctoral dissertation, Northcentral University]. <https://apnts.whdl.org/exploring-blended-learning-case-study-adult-learners-using-learningmanagement-system-face-face>
- Dumbraveanu, R. (2021). Challenges in the current distance education paradigm. The 17th international scientific conference e-learning and software for education.
- European Commission. (2018). DigComp 2.1: The digital competence framework for citizens. Publications Office of the European Union. <https://doi.org/10.2760/38842>
- Eroles, N. H. C. (2023). Learning action cell sessions on shared pedagogical practices of seasoned and Millennial teachers: Strengthening 21st century learning. *World Journal of Advanced Research and Reviews*, 21(2), 533–543. <https://doi.org/10.30574/wjarr.2024.21.2.1574>
- Esteron, M.A. (2021) Equity in Online Learning Amidst Pandemic in the Philippines. Graduate Studies of Education Management, Nueva Ecija University for Science and Technology, Philippines. Retrieved July 4, 2024 from https://ijels.com/upload_document/issue_files/23IJELS-109202148-Equityin.pdf
- Esteve-Mon, F. M., Llopis-Nebot, M. Á., & Adell-Segura, J. (2020). Digital teaching competence of university teachers: A systematic review of the literature. *IEEE Revista Iberoamericana de Tecnologías del Aprendizaje*, 15(4), 399–406. <https://doi.org/10.1109/RITA.2020.3033225>
- Estrellado, Carie Justine, Transition to Post-Pandemic Education in the Philippines: Unfolding Insights (February 6, 2022). *International Journal of Scientific and Research Publications*, Volume 11, Issue 12, December 2021 ISSN 2250-3153, 507. <https://doi.org/10.29322/IJSRP.11.12.2021.p12074>, Available at SSRN: <https://ssrn.com/abstract=4027679>
- Fart, A., & Madjasko, J., (2012) Recent advances in research on school-based extracurricular activities and adolescent development. Retrieved July 2, 2024 from [https://www.sciencedirect.com/topics/psychology/academic-performance#:~:text=Academic%20performance%20has%20been%20defined,bonding\)%2C%20and%20academic%20aspirations.](https://www.sciencedirect.com/topics/psychology/academic-performance#:~:text=Academic%20performance%20has%20been%20defined,bonding)%2C%20and%20academic%20aspirations.)
- Fenster, D. (2014). Implications of Teacher Tenure on Teacher Quality and Student Performance in North Carolina. <https://sites.duke.edu/djepapers/files/2016/10/danafensterdjepaper.pdf>
- F. Kirschner, F. Paas, P.A. Kirschner. A cognitive load approach to collaborative learning: United brains for complex tasks. *Educational Psychology Review*, 21 (1) (2009), pp. 31-42, 10.1007/s10648-008-9095-2

- Frey, A., Ruchkin, V., Martin, A., & Schwab-Stone, M. (2009). Adolescents in transition: School and family characteristics in the development of violent behaviors entering high school. *Child Psychiatry and Human Development*, 40(1),b 1–13. <https://doi.org/10.1007/S10578-008-0105-X/METRICS>
- Ghavifekr, S. & Rosdy, W.A.W. (2015). Teaching and learning with technology: Effectiveness of ICT integration in schools. *International Journal of Research in Education and Science (IJRES)*, 1(2), 175-191.
- Ghavifekr, S. and Rosdy, W. (2015), Volume 1, Issue 2, Summer 2015 ISSN: 2148-9955. Teaching and Learning with Technology: Effectiveness of ICT Integration in Schools. <https://files.eric.ed.gov/fulltext/EJ1105224.pdf>
- Goktas, Y., & Demirel, T. (2022). The impact of multimedia-supported learning on student engagement. *Journal of Educational Multimedia and Hypermedia*.
- González, C., Ponce, D. & Fernández, V. (2023) Teachers' experiences of teaching online during COVID-19: implications for postpandemic professional development. SpringerLink. Retrieved July 3, 2024 from <https://link.springer.com/article/10.1007/s11423-023-10200-9>
- Granziera, H., Collie, R.J., & Martin, A.J. (2019). Adaptability: An Important Capacity to Cultivate Among Pre-Service Teachers in Teacher Education Programmes. Retrieved June 15, 2024, from <https://files.eric.ed.gov/fulltext/EJ1216443.pdf>.
- Gronlund, N.E. & Linn, R.L., (n.d). Evaluation in Education: Meaning, Principles and Functions. Retrieved June 14, 2024 from https://www.yourarticlelibrary.com/education/evaluation-in-education-meaning-principles-and-functions/89656#google_vignette
- Habibu, Taban & Al Mamun, Abdullah & Clement, Che. (2012). Difficulties Faced by Teachers in Using ICT in Teaching-Learning at Technical and Higher Educational Institutions of Uganda. *International Journal of Engineering Research & Technology*. 1.
- Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, 3, 275–285. <https://doi.org/10.1016/j.susoc.2022.05.004>
- Hamlet, A. (2022). 5 strategies for rebuilding student engagement after COVID-19. Retrieved June 26, 2024 from <https://www.k12dive.com/news/5-strategies-for-rebuilding-student-engagement-after-covid-19/630143/>
- Hawthorne, H. (2022). What is Effective Teaching? High Speed Training. Retrieved July 4, 2024 from <https://www.highspeedtraining.co.uk/hub/what-is-effective-teaching/>
- Heilporn, G., Lakhal, S., & Bélisle, M., (2021) An examination of teachers' strategies to foster student engagement in blended learning in higher education. *International Journal of Educational Technology in Higher Education*. Retrieved June 24, 2024 from <https://educationaltechnologyjournal.springeropen.com/articles/10.1186/s41239-021-00260-3>
- Hossain, Ghazi. (2023). Challenges of Technology Integration in Teacher Education Programmes in Bangladeshi Tertiary Institutions. *English Language Teaching Perspectives*. 8. 16-30. 10.3126/eltp.v8i1-2.57854.

- Hwang, G.-J., & Tu, Y.-F. (2021). Roles and research trends of technology in technology-enhanced learning: A review of selected journals from 2001 to 2020. *Interactive Learning Environments*, 29(1), 1–21.
- Iilomäki, Liisa & Paavola, Sami & Lakkala, Minna & Kantosalo, Anna. (2016). Digital competence – an emergent boundary concept for policy and educational research. *Education and Information Technologies*. 21. 655–679. 10.1007/s10639-014-9346-4.
- Itow, R. C. (2020). Fostering valuable learning experiences by transforming current teaching practices: practical pedagogical approaches from online practitioners. *Information and Learning Sciences*.
- Jacobs, S. (n.d.). Improve Tenure with Better Measures of Teacher Effectiveness. <https://eric.ed.gov/?q=tenure+teachers+challenges&id=EJ1091875>
- Jarantilla, J & Garcia, N. (2024) Understanding the Lived Experiences of Seasoned Language Instructors in Online Teaching: A Phenomenology of Adjustment. *Psych Educ Multidisc J*, 2024, 24 (5), 490-516, doi: 10.5281/zenodo.13377477, ISSN 2822-4353. https://scimatic.org/show_manuscript/3498
- Jihan, S., Mamonto, E., Fatmawati, M., & Darmo (2023) Exploring the Impact of Post-Pandemic Learning Strategies on University Students' Engagement and Academic Achievement. Retrieved June 26, 2024, from file:///C:/Users/Acer/Downloads/3742-21927-1-PB.pdf
- Joaquin, J.J.B., Biana, H.T., & Dacela, M.A. (2020). The Philippine higher education sector in the time of COVID-19. *Frontiers in Education*, 5. <https://doi.org/10.3389/feduc.2020.576371>
- Jupp, B. (2009). What States Can Do to Improve Teacher Effectiveness. Retrieved July 3, 2024 from <https://files.eric.ed.gov/fulltext/ED507718.pdf>
- Kapur, R. (2018). Teacher Effectiveness. ResearchGate. Retrieved July 4, 2024 from https://www.researchgate.net/publication/323825113_Teacher_Effectiveness
- Khoza, N.G. (2022). A Review of Literature on the Effective Pedagogy Strategies for Online Teaching and Learning in Higher Education Institutions: Lessons from the COVID-19 Pandemic. Retrieved June 24, 2024, from <https://files.eric.ed.gov/fulltext/EJ1348784.pdf>
- Kimmons, R. (2016). Examining TPACK's theoretical future: The need for CPACK. *Contemporary Issues in Technology and Teacher Education*, 16(1), 20–35. <https://citejournal.org/volume-16/issue-1-16/general/examining-tpacks-theoretical-future-the-need-for-cpack/>
- Learning Journals. (2024) Learning Journals Ltd, registered address 42 Comrie Street, Crieff, Perth and Kinross, PH7 4AX, Company number SC433971, Incorporated in
- Leiner, B. M., Cerf, V. G., Clark, D. D., Kahn, R. E., Kleinrock, L., Lynch, D. C., Postel, J., Roberts, L. G., & Wolff, S. (2017). A brief history of the Internet. *ACM SIGCOMM Computer Communication Review*, 39(5), 22–31. <https://doi.org/10.1145/1629607.1629613>
- Lewin, D., Lundie, D. (2016) Philosophies of Digital Pedagogy. *Stud Philos Educ* 35, 235–240. <https://doi.org/10.1007/s11217-016-9514-7>
- Liu, J., Aziku, M., Qiang, F. *et al.* Leveraging professional learning communities in linking digital professional development and instructional integration: evidence from 16,072 STEM teachers. *IJ STEM Ed* 11, 56 (2024). <https://doi.org/10.1186/s40594-024-00513-3>
- Lopez, E. (2024) Struggles and Coping Mechanisms of Secondary Seasoned Teachers in Teaching

- Mathematics Using Technology. Psych Educ Multidisc J, 2024, 22 (9), 1037-1062, doi: 10.5281/zenodo.13154697, ISSN 2822-4353. https://scimatic.org/show_manuscript/3318
- Lorredo, M. (2021) Adaptability of Teachers and Parents to the Challenges in the Utilization of Self-Learning Modules. Retrieved July 5, 2024 from <https://mseuf.edu.ph/research/read/1358>
- Mahyoob, M. (2021). Challenges of e-Learning during the COVID-19 Pandemic Experienced by EFL Learners. Arab World English Journal (AWEJ), Volume 11.
- Number4 (ISSN: 2229-9327 doi: <https://dx.doi.org/10.24093/awej/vol11no4.23>), 351 - 362.
- Mapaddang, A., Khusaini, K., Sinaga, M. & Elizabeth, E. (2022) Academic interest determines the academic performance of undergraduate accounting students: Multinomial logit evidence. Retrieved July 2, 2024 from <https://www.tandfonline.com/doi/full/10.1080/23311975.2022.2101326>
- Martin, A. J., Nejad, H. G., Colmar, S., and Liem, G. A. D. (2012). Adaptability: conceptual and empirical perspectives on responses to change, novelty and uncertainty. Aust. J. Guid. Couns. 22, 58–81. doi: 10.1017/jgc.2012.8
- Meador, D. (2019). Pros and Cons of Teacher Tenure. <https://www.thoughtco.com/what-is-teacher-tenure-3194690>
- Mehta, Timsy. (2022). Teaching Effectiveness in the Post Covid Times. International Journal of Innovative Research & Growth. 11. 12681-12684. 10.15680/IJRSET.2022.1110026.
- McNulty, N. (2023) Medium. Digital Pedagogy, or How Best to Incorporate Technology in Your Teaching.
- Mladenova, T., Kalmukov, Y., & Valova, I. (2020). Covid 19 – A major cause of digital transformation in education or just an evaluation test. TEM Journal, 9(3), 1163-1170. doi: Retrieved June 24, 2024 from <http://dx.doi.org/10.18421/TEM93-42>
- Morant, B. (2021) Post-Pandemic Education. Retrieved July 5, 2024 from <https://www.forbes.com/sites/blakedmorant/2021/05/20/post-pandemic-education/>
- Nanjundaswamy, C., Baskaran, S., & Leela, M.H., (2021) Digital Pedagogy for Sustainable Learning. Shanlax International Journal of Education. Retrieved June 24, 2024, from <https://files.eric.ed.gov/fulltext/EJ1300885.pdf>
- Ng, W. (2018). Conceptualising digital literacy for higher education. Research in Learning Technology, 26, 1-13. <https://doi.org/10.25304/rlt.v26.1925>
- Ngoasong, M. Z. (2022). Curriculum Adaptation for Blended Learning in Resource-Scarce Contexts.
- Ondras, L. B., and Alvero, J. 2023. “Post-Pandemic Challenges in Addressing Learning Gaps: Experiences of Teachers in Public Elementary and Secondary Schools”. Asian Journal of Education and Social Studies 47 (4):38-46. <https://doi.org/10.9734/ajess/2023/v47i41032>.
- Oskarita, Elsa & Arasy, Hadid. (2024). The Role of Digital Tools in Enhancing Collaborative Learning in Secondary Education. International Journal of Educational Research. 1. 26-32. 10.62951/ijer.v1i1.15.
- Pham, V., Chau, H., & Hoang, T. (2024) Student Engagement in the Context of Post-Covid: A Case of Higher Education Institutions. Retrieved June 26, 2024, from https://www.researchgate.net/publication/379037785_Student_Engagement_in_the_Context_of_Post-Covid_A_Case_of_Higher_Education_Institutions

- Phillips, E. (2009). The Effect of Tenure on Teacher Performance in Secondary Education. <https://ecommons.cornell.edu/server/api/core/bitstreams/c73eab24-ae8c-4ba2-ace1-ad6fdb9a47bb/content>
- Pollock, J. E. (2018). Improving student learning one teacher at a time: What works best. ASCD.
- Prieur, J. (2022). Prodigy. 8 Powerful Ways to Promote Equity in the Classroom. Retrieved June 16, 2024, from <https://www.prodigygame.com/main-en/blog/equity-in-the-classroom/>
- Ramos, Lerma, Saldaña, Brugada & Fragoso. (2022) National Library of Medicine. Academic Performance during the COVID-19 Pandemic and Its Relationship with
- Rochel, S. L. (n.d.). Veteran public secondary teachers' lived experiences describing challenges and changes ending their career: a descriptive phenomenological study. <https://eric.ed.gov/?q=tenure+teachers+challenges&id=ED658794>
- Rodin, N.C. (2023) What challenges did Philippine higher education faced during pandemic? Retrieved June 25, 2024, from <https://typeset.io/questions/what-challenges-did-philippine-higher-education-faced-during-fw6qjisece>
- Rodriguez, M. (2023) Student Engagement and Motivation in Post-Pandemic Higher Education Mathematics: A Concept Paper. Research Gate. Retrieved June 26, 2024, from https://www.researchgate.net/publication/373431473_Student_Engagement_and_Motivation_in_Post-Pandemic_Higher_Education_Mathematics_A_Concept_Paper
- Rosenbusch, K. (2020). Technology Intervention: Rethinking the role of education and faculty in the transformative digital environment. *Advances in Developing Human Resources*, 22(1), 87–101. <https://doi.org/10.1177/1523422319886297>
- Salas, E., Tannenbaum, S. I., Kraiger, K., & Smith-Jentsch, K. A. (2015). The science of training and development in organizations: What matters in practice. *Psychological Science in the Public Interest*, 16(2), 74–101. <https://doi.org/10.1177/1529100615581986>
- Sánchez-Mena, A., & Martí-Parreño, J. (2017). Gamification in higher education: A systematic mapping study. *Educational Technology & Society*, 20(4), 75–88.
- Santiago, et.al, (2021) Flexible Learning Adaptabilities in the New Normal: E-Learning Resources, Digital Meeting Platforms, Online Learning Systems and Learning Engagement. *Asian Journal of Distance Education (AsianJDE)*. Retrieved July 5, 2024 from <https://files.eric.ed.gov/fulltext/EJ1332615.pdf>
- Santos, C. G. E. (2021, December 15). The quality of life of seasoned tertiary teachers engaged in distance learning approach. <https://eric.ed.gov/?id=ED620422>
- Saro, J. M. (2022). New Normal Education: Strategies, Methods, and Trends of Teaching-Learning on Students' Perspectives and Its Effectiveness. Retrieved June 24, 2024, from <https://philarchive.org/archive/SARNNE-5>
- Selwyn, N. (2016). Is technology good for education? Polity Press.
- Skantz-Åberg, E., Lantz-Andersson, A., Lundin, M., & Williams, P. (2022). Teachers' professional digital competence: an overview of conceptualisations in the literature. *Cogent Education*, 9(1). <https://doi.org/10.1080/2331186X.2022.2063224>
- Stoian, C., Fărcașiu, M.A., Dragomir, G.M., & Gherheș, V. (2022) Transition from Online to Face-to-Face Education after COVID-19: The Benefits of Online Education from Students' Perspective.

Retrieved June 25, 2024, from <https://www.mdpi.com/2071-1050/14/19/12812>

- Stronge, J., Grant, L.W., and Xu, X. (2015) Teacher Behaviours and Student Outcomes. International Encyclopedia of the Social & Behavioral Sciences (Second Edition). Pages 44-50. Retrieved July 3, 2024 <https://www.sciencedirect.com/science/article/abs/pii/B9780080970868920841>
- Suzer, E., & Koc, M. (2024). Teachers' digital competency level according to various variables: A study based on the European DigCompEdu framework in a large Turkish city. Education and Information Technologies. <https://doi.org/10.1007/s10639-024-12711-1>
- Schwab, K. (2016). The Fourth Industrial Revolution. World Economic Forum.
- Tenure: Perspectives and Challenges (2002) | AAUP. n.d.). <https://www.aaup.org/issues/tenure/tenure-perspectives-and-challenges-2002>
- Terzieva, T., Rahneva, O., & Dilyanov, V., (2021) Pedagogical Strategies for Development of Cognitive Skills in A Digital Environment. Retrieved June 24, 2024 from https://www.researchgate.net/profile/Olga-Rahneva/publication/356267867_PEDAGOGICAL_STRATEGIES_FOR_DEVELOPMENT_OF_COGNITIVE_SKILLS_IN_A_DIGITAL_ENVIRONMENT/links/61941a733068c54fa5f3d459/PEDAGOGICAL-STRATEGIES-FOR-DEVELOPMENT-OF-COGNITIVE-SKILLS-IN-A-DIGITAL-ENVIRONMENT.pdf
- Thahir, et. Al (2023) The Post Pandemic Education : A Blended Learning Approach For Teaching And Learning In Higher Education in New Normal Era. Retrieved July 5, 2024 from <https://journal.rescollacomm.com/index.php/ijeer/article/view/461>
- The University of Manchester (2024). Adaptability and flexibility. Retrieved July 5, 2024 from <https://www.careers.manchester.ac.uk/findjobs/skills/adaptability/>
- Trowler, V. (2010). Student engagement literature review. The Higher Education Academy, 11(1), 1–15.
- Vaataja, J. & Ruokamo, H. (2021) Conceptualizing Dimensions and a Model for Digital Pedagogy. Journal of Pacific Rim Psychology. Retrieved June 24, 2024, from https://www.researchgate.net/publication/350584811_Conceptualizing_dimensions_and_a_model_for_digital_pedagogy
- Wulansari, Tika & Sudiyanto, Sudiyanto & Sumaryati, Sri. (2022). Chances and Challenges of Digital-Based Education: A Literature Review. 10.2991/978-2-494069-09-1_59.
- Yilmaz, A (2018). Distance and face-to-face students' perceptions towards distance education: A comparative metaphorical study. Turkish Online Journal of Distance Education-TOJDE, 20(1), 191-207.
- Zhang, W. (2022). The role of Technology-Based Education and Teacher Professional Development in English as a Foreign Language classes. *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.910315>
- Zhao, X. & Xue, W. (2022) From online to offline education in the post-pandemic era: Challenges encountered by international students at British universities. National Library of Medicine. Retrieved June 24, 2024, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9890062/>