

A Drive for Digital Adoption: Digital Technology Usage, Technology Acceptance, and Professional Development Needs of Teachers in Public Schools in Sulu

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ABSTRACT

This study examined digital technology usage, technology acceptance, and professional development needs among public school teachers in Sulu. It assessed teachers' use of digital tools in lesson planning, facilitating learning, and learning assessment; examined acceptance-related factors and the alignment of professional development with digital competence standards; identified predictors of digital technology usage; and tested differences across selected demographic and contextual variables. A quantitative design using descriptive, correlational, regression, and comparative approaches was employed. A total of 329 teachers were selected from a population of 2,275 through multistage cluster and simple random sampling. Data were gathered using a contextualized, expert-validated questionnaire anchored on the Unified Theory of Acceptance and

Use of Technology and the DigCompEdu framework; pilot testing with 10 teachers produced Cronbach's alpha coefficients ranging from .787 to .900. Means, standard deviations, one-sample t-tests, multiple regression, independent-samples t-tests, and analysis of variance were used. Teachers reported high digital technology usage in lesson planning ($M = 3.83$), facilitating learning ($M = 3.49$), and learning assessment ($M = 3.76$). Acceptance factors and professional development alignment were also high. Multiple regression showed that digital infrastructure and resources, perceived usefulness, perceived ease of use, and standards-aligned professional development significantly predicted technology usage, with the model explaining 75.0% of the variance. Usage did not significantly differ by age, length of service, sex, or place of assignment, but differed by source of energy. The findings indicate that sustainable digital adoption depends primarily on enabling infrastructure, usability, perceived instructional value, and professional development aligned with recognized digital competence standards.

Keywords: *digital technology usage, technology acceptance, professional development, DigCompEdu, public school teachers, Sulu*

INTRODUCTION

Digital technology has become increasingly embedded in educational planning, instruction, communication, and assessment. Teachers are expected not only to operate digital tools but also to select them purposefully and integrate them in ways that improve teaching and learning. Technology adoption therefore involves both actual usage and teachers' perceptions of the value, accessibility, and manageability of digital tools. The Unified Theory of Acceptance and Use of Technology explains that users' expectations and facilitating conditions influence adoption behavior, while the Technology Acceptance Model emphasizes perceived usefulness and perceived ease of use as central determinants of technology acceptance (Davis, 1989; Venkatesh et al., 2003).

Research on technology integration consistently shows that access and competence do not automatically result in meaningful classroom use. Teachers may be able to use basic digital applications but still need support in designing interactive lessons, conducting digital assessment, and sustaining technology-mediated engagement. Systematic reviews have emphasized the importance of teacher perceptions, professional learning, and school-level conditions in shaping integration (Akram et al., 2022). Digital competence frameworks such as DigCompEdu further broaden this expectation by positioning digital resources, teaching and learning, assessment, and professional engagement as interconnected areas of teacher competence (Redecker, 2017; Basantes-Andrade et al., 2022).

In the Philippine context, public school teachers have increasingly adopted digital tools for instructional preparation, communication, and assessment, yet disparities in infrastructure, electricity, internet access, and technical support remain important constraints. Filipino teachers' digital competence has been associated with their ability to use technology in post-pandemic pedagogy (Abella & Dela Rosa, 2023), while contextual studies have highlighted infrastructure as a practical condition for effective technology use (Derder et al., 2023; Espinosa et al., 2025). These conditions are particularly important in Sulu, where schools are geographically dispersed and may operate under different energy and connectivity arrangements.

The present study addressed the limited empirical evidence on how public-school teachers in Sulu use digital technology, accept digital tools, and experience professional development in relation to recognized digital competence standards. It examined three domains of digital technology usage—lesson planning, facilitating learning, and learning assessment—together with acceptance factors involving digital infrastructure and resources, perceived usefulness, perceived ease of use, performance expectancy, self-efficacy, and social encouragement. It also assessed professional development alignment, identified predictors of usage, and tested whether usage differed across demographic and contextual groupings. The study was intended to provide an empirical basis for infrastructure priorities, professional development design, and sustainable digital adoption in public schools in Sulu.

Literature Review

Digital Technology Use in Instruction

Digital technology use in teaching extends across the instructional cycle. In lesson planning, teachers can locate digital resources, organize content, prepare presentations, and develop interactive materials. In classroom facilitation, multimedia, learning management systems, communication platforms, and simulations can support presentation and student engagement. In assessment, digital tools can be used to prepare tests, grade work, create rubrics, provide feedback, and analyze performance data. Research indicates that ICT-supported lesson planning can contribute to more structured instructional design, while digital assessment can strengthen timely feedback and data-informed teaching (König et al., 2022; Jurāne-Brēmane, 2023).

However, technology use frequently remains stronger for preparation and content delivery than for participatory or learner-centered activities. Javier (2021) documented Filipino teachers' use of digital teaching technologies and the need for continuing professional support. Akram et al. (2022) similarly found that teachers' perceptions and contextual conditions shape technology integration across teaching-learning practices. These findings suggest that measuring overall technology use is insufficient; examining how teachers use technology at different instructional stages is necessary for identifying meaningful areas for professional development.

Technology Acceptance and Enabling Conditions

Technology acceptance theories provide a basis for explaining why teachers adopt or avoid digital tools. Davis (1989) identified perceived usefulness and perceived ease of use as major determinants of acceptance, while Venkatesh et al. (2003) expanded this perspective by incorporating performance expectancy, social influence, and facilitating conditions. In educational settings, teachers are more likely to sustain digital practices when they perceive technologies as useful, manageable, and supportive of instructional goals. Prior experience can also

influence acceptance, as teachers who have used learning management systems tend to differ in their beliefs and willingness to continue technology-supported teaching (Dindar et al., 2021).

Infrastructure and institutional conditions are equally important because favorable attitudes cannot compensate for unreliable access. Derder et al. (2023) emphasized the contribution of digital infrastructure to teaching effectiveness, while Espinosa et al. (2025) highlighted contextual barriers affecting ICT integration in Philippine schools. Teachers' confidence also supports adoption, particularly when they can troubleshoot difficulties and adapt to emerging tools; nevertheless, self-efficacy operates within the opportunities and constraints created by the school environment (Baroudi & Shaya, 2022). Together, these studies support examining acceptance as a combination of beliefs, competence, and enabling conditions.

Professional Development and Digital Competence Standards

Professional development is a key mechanism for moving technology adoption from basic technical operation toward pedagogically meaningful use. DigCompEdu identifies professional engagement, digital resources, teaching and learning, assessment, empowering learners, and facilitating learners' digital competence as major areas of educator competence (Redecker, 2017). Systematic evidence also shows that digital competence standards can guide teacher development by clarifying the knowledge and practices needed for effective technology integration (Basantes-Andrade et al., 2022). Standards-aligned professional learning therefore provides a structure for evaluating whether training addresses instructional application rather than isolated tool skills.

The value of professional development depends on its relevance, continuity, and alignment with classroom practice. Suzer and Koç (2024) demonstrated the usefulness of the DigCompEdu framework in examining teachers' digital competence across different conditions. The OECD (2023) likewise emphasized formal approaches to teacher digital competence development. For teachers in contexts with uneven infrastructure, professional development must also be adaptable to local realities, including low-bandwidth tools, offline preparation, alternative energy sources, and collaborative support. Training that is anchored in recognized standards yet responsive to context can better support sustainable adoption.

Demographic and Contextual Factors in Digital Adoption

Studies have produced mixed findings regarding demographic differences in technology adoption. Teacher age, experience, sex, educational attainment, and geographic assignment may influence exposure to technology, but these characteristics do not necessarily determine actual use. David and Aruta (2022) modeled Filipino teachers' intention to use technology and showed that technology adoption is better understood through interacting psychological and contextual factors than through demographic characteristics alone. Differences in technology use across urban and rural settings have also been associated with disparities in access and school conditions rather than individual background alone (Asrial et al., 2021).

In geographically dispersed areas, contextual conditions such as reliable electricity become especially important. Even teachers with positive attitudes and adequate competence may be unable to use technology consistently when classrooms lack stable power or equipment. This perspective is consistent with the study's conceptual framework, which treats demographic variables as comparative factors while positioning acceptance-related conditions and professional development as direct influences on digital technology usage. The framework therefore reflects a practical view of adoption in which teachers' willingness and competence operate within the opportunities provided by their schools.

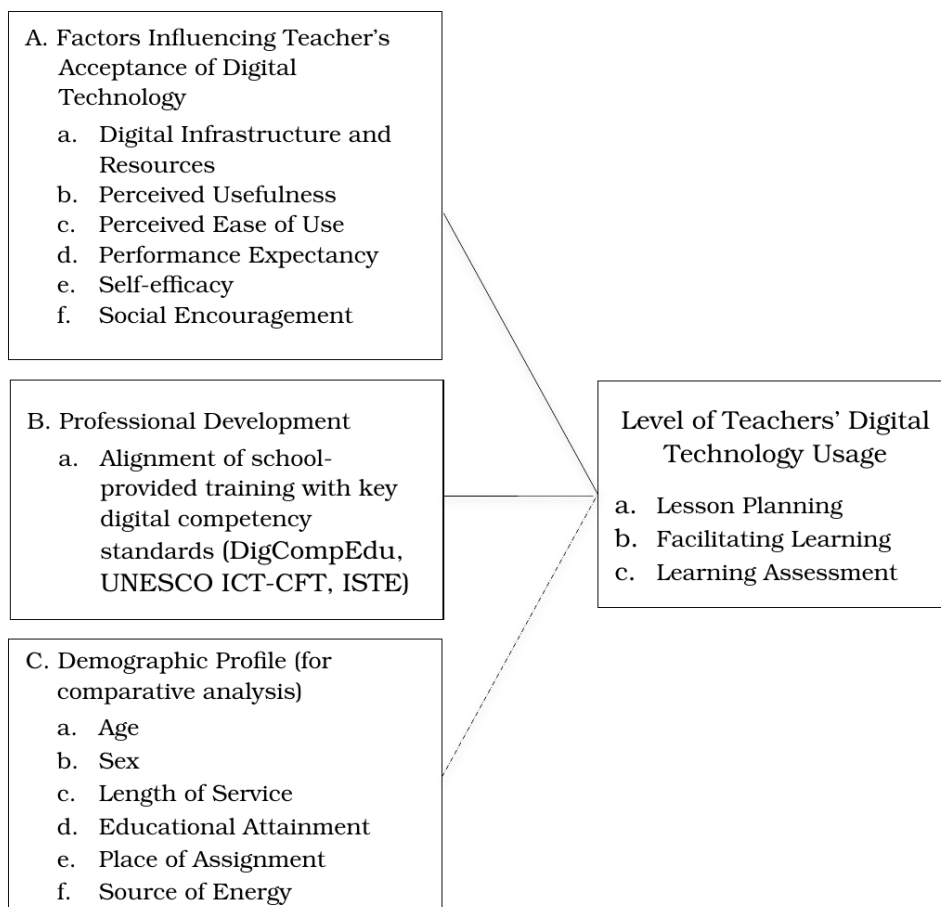


Figure 1. *Conceptual framework showing the relationships among teachers' technology acceptance, professional development alignment with digital competence standards, demographic profile, and the level of digital technology usage.*

METHODS

Research Design

The study employed a quantitative research design using descriptive, correlational, multiple-regression, and causal-comparative approaches. The descriptive component determined the levels of teachers' digital technology usage, their acceptance of digital technology, and the alignment of professional development initiatives with digital competence standards. Multiple regression examined the predictive contribution of acceptance factors and professional development alignment to technology usage. Comparative analyses tested differences in digital technology usage across selected demographic and contextual variables. This nonexperimental design was appropriate because the variables were measured as they naturally occurred without manipulation (Creswell & Creswell, 2018).

Research Locale

The study was conducted in selected public schools across 13 municipalities in Sulu, Philippines. The setting included teachers assigned to mainland and island schools and schools operating under different energy arrangements, including connection to the power grid, no grid connection, solar power, and generators. These contextual differences were relevant to the study because digital technology integration in the province depends not only on teacher competence and acceptance but also on the availability of infrastructure and reliable electricity.

Participants and Sampling Technique

The population consisted of 2,275 active public school teachers based on the official master list obtained from the Schools Division Office of Sulu. Using Cochran's formula at a 95% confidence level and 5% margin of error, followed by finite-population correction, the required sample was 329 teachers. A multistage sampling procedure was used. Municipalities served as natural clusters in the first stage, after which simple random sampling through a fishbowl technique was applied within the selected clusters. The procedure was intended to provide proportional geographic representation while giving eligible teachers an equal chance of selection.

Research Instrument

Data were gathered using a self-devised, prestructured questionnaire contextualized for public schools in Sulu. The technology-acceptance items were anchored on the Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003), while the teacher questionnaire and professional-development audit were informed by the European Framework for the Digital Competence of Educators (Redecker, 2017). The instrument contained four parts: demographic information; digital technology usage in lesson planning, facilitating learning, and learning assessment; acceptance factors involving digital infrastructure and resources, perceived usefulness, perceived ease of use, performance expectancy, self-efficacy, and social encouragement; and professional-development alignment with digital competence standards. Responses were recorded on a five-point Likert scale.

The questionnaire underwent content validation by three experts representing research methodology, ICT education, and public-school administration. Content-validity ratings ranged from 3.00 to 4.00, interpreted in the dissertation as relevant to highly relevant. After revision, the instrument was pilot-tested with 10 public school teachers who were not included in the main sample. Cronbach's alpha coefficients across the instrument components ranged from .787 to .900, exceeding the .70 reliability criterion used in the study.

Data Gathering Procedure

The draft questionnaire was first reviewed by the dissertation adviser and subsequently validated by three experts. After incorporating the recommended revisions, the researcher conducted the pilot test and examined internal consistency. Formal permission was then obtained from the Schools Division Superintendent and the principals or school heads of participating schools. The finalized survey was distributed to the selected teacher-respondents, after which completed questionnaires were collected, checked for completeness, encoded, and prepared for statistical analysis. Informal interviews with selected respondents were also used to contextualize the quantitative responses, particularly regarding technology use in schools with limited or no direct access to electricity.

Data Analysis

Means and standard deviations were used to describe teachers' digital technology usage, technology-acceptance factors, and professional-development alignment. One-sample t-tests were used as supplementary analyses to determine whether observed means were significantly above the scale midpoint. Multiple linear regression identified the combined and individual contributions of digital infrastructure and resources, perceived usefulness, perceived ease of use, performance expectancy, self-efficacy, social encouragement, and professional-development alignment to digital technology usage. One-way ANOVA was used for demographic variables with more than two groups, while independent-samples t-tests were used for dichotomous groupings. Tukey's HSD was applied following significant ANOVA results. Statistical significance was evaluated at the .05 level.

Ethical Consideration

Participation was voluntary and based on informed consent. The researcher secured permission from school authorities before data collection and informed respondents that no personally identifying information would be collected or shared. Responses were treated as confidential, used solely for research purposes, and handled in accordance with the Data Privacy Act of 2012. Participants were free to decide whether to participate, and the procedures were implemented only after the required institutional permissions had been obtained.

RESULTS AND DISCUSSION

Digital Technology Usage in Instruction

Teachers demonstrated a high level of digital technology usage across the three instructional domains. Lesson planning obtained an overall mean of 3.83 (SD = 0.76), facilitating learning obtained 3.49 (SD = 0.79), and learning assessment obtained 3.76 (SD = 0.73). One-sample t-tests showed that all three means were significantly above the scale midpoint: lesson planning, $t(328) = 19.92$, $p < .001$; facilitating learning, $t(328) = 11.25$, $p < .001$; and learning assessment, $t(328) = 18.90$, $p < .001$. The pattern indicates that digital tools were already integrated into routine instructional work, with comparatively stronger use for lesson preparation and assessment than for interactive facilitation.

Table 1. *Teachers' Digital Technology Usage across Instructional Domains*

Domain	M	SD	VI	t(328)	p
Lesson Planning	3.83	0.76	High	19.92	< .001
Facilitating Learning	3.49	0.79	High	11.25	< .001
Learning Assessment	3.76	0.73	High	18.90	< .001

Note. VI = verbal interpretation. Scale: 4.21–5.00 = Very High; 3.41–4.20 = High; 2.61–3.40 = Moderate; 1.81–2.60 = Low; 1.00–1.80 = Very Low.

Within lesson planning, searching online for teaching materials was the highest-rated practice ($M = 4.11$), while digital tools were also commonly used to prepare lesson plans, organize content, and create interactive materials. In facilitating learning, multimedia use was strongest ($M = 3.69$), whereas online discussions were only moderate ($M = 3.29$), showing that participatory digital strategies were less consistently implemented. In assessment, analyzing student performance with digital tools ($M = 3.96$) and preparing assessment documents with computer software ($M = 3.92$) were particularly common. These results are consistent with studies showing that teachers often adopt technology first for preparation, presentation, and assessment before moving toward more interactive digital pedagogy (Javier, 2021; König et al., 2022; Jurāne-Brēmane, 2023).

Technology Acceptance and Professional Development Alignment

Teachers reported high levels of acceptance across all measured factors. Perceived usefulness obtained the highest mean ($M = 3.95$, $SD = 0.82$), followed by social encouragement ($M = 3.93$, $SD = 0.72$), performance expectancy ($M = 3.90$, $SD = 0.70$), self-efficacy ($M = 3.79$, $SD = 0.71$), perceived ease of use ($M = 3.74$, $SD = 0.74$), and digital infrastructure and resources ($M = 3.55$, $SD = 0.81$). Each acceptance factor was significantly above the neutral midpoint at $p < .001$. The overall pattern indicates that teachers generally viewed digital technologies as useful, manageable, and supported by their professional environment, while infrastructure received the lowest—though still high—rating among the acceptance dimensions.

Table 2. *Technology Acceptance Factors and Professional Development Alignment*

Factor	M	SD	VI
Digital Infrastructure and Resources	3.55	0.81	High
Perceived Usefulness	3.95	0.82	High
Perceived Ease of Use	3.74	0.74	High
Performance Expectancy	3.90	0.70	High
Self-Efficacy	3.79	0.71	High
Social Encouragement	3.93	0.72	High
PD Alignment with Digital Competence Standards	3.80	0.81	High

Professional development initiatives were also highly aligned with digital competence standards (overall $M = 3.80$, $SD = 0.81$). Teaching and Learning showed the highest domain alignment ($M = 3.92$), followed by Digital Resources ($M = 3.85$), Assessment ($M = 3.77$), and Professional Engagement ($M = 3.70$). This suggests that school-provided training extended beyond basic technical skills to include pedagogical use, digital assessment, and professional collaboration. The finding supports the use of standards-based professional learning as a mechanism for strengthening meaningful digital integration (Redecker, 2017; Basantes-Andrade et al., 2022; Suzer & Koç, 2024).

Predictors of Teachers' Digital Technology Usage

The multiple regression model was statistically significant, $F(7, 321) = 137.725$, $p < .001$, with $R = .866$, $R^2 = .750$, and adjusted $R^2 = .745$. Thus, the seven predictors collectively explained 75.0% of the variance in teachers' digital technology usage. Digital infrastructure and resources was the strongest significant predictor ($\beta = .350$, $p < .001$), followed by perceived ease of use ($\beta = .301$, $p < .001$), perceived usefulness ($\beta = .216$, $p < .001$), and professional-development alignment with digital competence standards ($\beta = .085$, $p = .037$). Performance expectancy, self-efficacy, and social encouragement were not significant when the other predictors were held constant.

Table 3. *Multiple Linear Regression Predicting Teachers' Digital Technology Usage*

Predictor	B	SE B	β	p
Digital Infrastructure and Resources	.294	.034	.350	< .001
Perceived Usefulness	.179	.042	.216	< .001
Perceived Ease of Use	.279	.048	.301	< .001
Performance Expectancy	.013	.059	.013	.830
Self-Efficacy	.084	.055	.087	.128
Social Encouragement	-.039	.053	-.042	.461
PD Alignment with Digital Competence Standards	.085	.041	.085	.037

Note. $R = .866$, $R^2 = .750$, adjusted $R^2 = .745$, $F(7, 321) = 137.725$, $p < .001$; Durbin-Watson = 1.759.

These findings show that positive attitudes are important but do not operate independently of enabling conditions. Teachers were most likely to use digital technology when they had adequate infrastructure, perceived the tools as useful and easy to use, and received professional development connected with recognized standards. This pattern directly supports the central propositions of technology-acceptance theory regarding usefulness, ease of use, and facilitating conditions (Davis, 1989; Venkatesh et al., 2003). It also reinforces evidence from public-school settings that infrastructure and context can determine whether teachers are able to translate competence and favorable beliefs into actual practice (Derder et al., 2023; Espinosa et al., 2025).

Differences in Digital Technology Usage across Teacher Groups

Digital technology usage did not significantly differ by age, $F(2, 326) = 1.240$, $p = .291$; length of service, $F(2, 326) = 0.365$, $p = .695$; sex, $t(327) = 1.067$, $p = .287$; or place of assignment, $t(327) = -1.205$, $p = .229$. These nonsignificant results indicate that usage was broadly comparable across most demographic groups, despite small variations in mean scores. The findings suggest that personal demographic characteristics were less influential than the conditions under which teachers worked.

Table 4. *Differences in Digital Technology Usage across Selected Groupings*

Variable	Group Means, M (SD)	Test	p	Result
Age	$\leq 35 = 3.76$ (.66); $36-45 = 3.65$ (.72); $\geq 46 = 3.63$ (.66)	$F = 1.240$	.291	NS
Length of Service	Early = 3.72 (.69); Mid = 3.67 (.63); Late = 3.63 (.77)	$F = 0.365$	.695	NS
Source of Energy	Grid = 3.80 (.60); No grid = 3.15 (.92); Solar = 3.77 (.38); Generator = 4.04 (.09)	$F = 15.761$	< .001	Significant
Sex	Male = 3.80 (.71); Female = 3.68 (.68)	$t = 1.067$	.287	NS
Place of Assignment	Mainland = 3.68 (.71); Island = 3.81 (.50)	$t = -1.205$	.229	NS

Source of energy was the exception. Technology usage differed significantly across energy-source groups, $F(3, 325) = 15.761, p < .001$. Teachers in schools connected to the power grid ($M = 3.80$), using solar power ($M = 3.77$), or relying on generators ($M = 4.04$) reported higher usage than teachers in schools not connected to the power grid ($M = 3.15$). This result demonstrates that reliable access to electricity is a concrete enabling condition for digital adoption. It also clarifies why the study's recommendations emphasize infrastructure and reliable energy rather than demographic targeting as the more actionable route toward equitable technology integration.

CONCLUSION

Public school teachers in Sulu demonstrated high digital technology usage in lesson planning, facilitating learning, and learning assessment, indicating that digital tools had become part of routine instructional practice. Nevertheless, the comparatively lower use of online discussion and participatory digital strategies showed that integration remained stronger for functional preparation, presentation, and assessment than for fully interactive pedagogy. Teachers also expressed high acceptance of digital technology, and professional development initiatives were highly aligned with digital competence standards.

Actual technology usage was most strongly associated with enabling conditions. Digital infrastructure and resources, perceived ease of use, perceived usefulness, and standards-aligned professional development significantly predicted usage and collectively explained a substantial proportion of its variance. Age, length of service, sex, and place of assignment did not produce significant differences, whereas source of energy did. The study therefore concludes that sustainable digital adoption in Sulu depends less on demographic characteristics than on reliable infrastructure, accessible and usable technologies, perceived instructional value, and professional development that supports pedagogically meaningful integration.

Recommendation

Education authorities and school administrators should prioritize reliable electricity, stable internet access, updated digital equipment, and maintenance support, particularly in off-grid and remote schools. Digital competence frameworks such as DigCompEdu may be used as references for designing and evaluating sustained teacher-development programs. Professional development should remain practical and classroom-oriented, with greater emphasis on interactive facilitation, learner participation, digital assessment, and context-appropriate strategies rather than on technical operation alone.

Schools should periodically assess infrastructure, teacher competencies, and actual patterns of technology use to identify context-specific gaps. Digitally skilled teachers may be engaged as mentors through learning circles or coaching arrangements, while school heads may review digital practices and provide formative feedback. Future research should supplement self-reported survey data with interviews, focus groups, classroom observations, and longitudinal designs; examine relationships between teachers' digital technology use and student outcomes; and replicate the study in other school sectors and regions to extend the evidence base.

References

- Abella, J. L., & Dela Rosa, E. (2023). Digital literacy and digital competence of selected Filipino teachers: Basis for a post-pandemic pedagogy. *International Journal of Recent Educational Research*, 4(5).
<https://doi.org/10.46245/ijorer.v4i5.378>
- Akram, H., Abdelrady, A. H., Al-Adwan, A. S., & Ramzan, M. (2022). Teachers' perceptions of technology integration in teaching-learning practices: A systematic review. *Frontiers in Psychology*, 13, 920317.
<https://doi.org/10.3389/fpsyg.2022.920317>
- Asrial, Syahrial, Kurniawan, D. A., & Perdana, R. (2021). Differences in teachers' ability to integrate ICT in urban and rural schools in Indonesia. *International Journal of Emerging Technologies in Learning*, 16(11), 212–223.
<https://doi.org/10.3991/ijet.v16i11.21205>
- Baroudi, S., & Shaya, N. (2022). Exploring predictors of teachers' self-efficacy for online teaching in the Arab world amid COVID-19. *Education and Information Technologies*, 27, 8093–8110. <https://doi.org/10.1007/s10639-022-10946-4>

- Basantes-Andrade, A., Casillas-Martín, S., Cabezas-González, M., Naranjo-Toro, M., & Guerra-Reyes, F. (2022). Standards of teacher digital competence in higher education: A systematic literature review. *Sustainability*, 14(21), 13983. <https://doi.org/10.3390/su142113983>
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE.
- David, A. P., & Aruta, J. J. B. R. (2022). Modeling Filipino teachers' intention to use technology: A MIMIC approach. *Educational Media International*, 59(1), 62–79. <https://doi.org/10.1080/09523987.2022.2036811>
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340. <https://doi.org/10.2307/249008>
- Derder, A., Sudaria, R., & Paglinawan, J. (2023). Digital infrastructure on teaching effectiveness of public-school teachers. *American Journal of Education and Practice*, 7(6), 1–13. <https://doi.org/10.47672/ajep.1719>
- Dindar, M., Suorsa, A., Hermes, J. W. S., Karppinen, P., & Näykki, P. (2021). Comparing technology acceptance of K–12 teachers with and without prior experience of learning management systems: A COVID-19 pandemic study. *Journal of Computer Assisted Learning*, 37(6), 1553–1565. <https://doi.org/10.1111/jcal.12572>
- Espinosa, A. A., Gomez, M. A. C., Miranda, P. A., David, A. P., Abulon, E. L. R., Hermosisima, M. V. C., Quinosa, E. A., Jr., Soliman, A. A., de Vera, J. L., Claros, I. H. A., Cruz, H. G. M., & Gonzales, N. S. J. (2025). Bridging a digital divide: A critical analysis of contextual factors affecting ICT integration in Philippine schools. *Issues in Educational Research*, 35(2), 526–551.
- Javier, B. F. (2021). Practices of Filipino public high school teachers on digital teaching and learning technologies during the COVID-19 pandemic: Basis for learning action cell sessions. *International Journal of Computing Sciences Research*, 6, 707–722. <https://doi.org/10.25147/ijcsr.2017.001.1.67>
- Jurāne-Brēmane, A. (2023). Digital assessment in technology-enriched education: Thematic review. *Education Sciences*, 13(5), 522. <https://doi.org/10.3390/educsci13050522>
- König, J., Heine, S., Jäger-Biela, D., & Rothland, M. (2022). ICT integration in teachers' lesson plans: A scoping review of empirical studies. *European Journal of Teacher Education*, 47(1), 1–29. <https://doi.org/10.1080/02619768.2022.2138323>
- Organisation for Economic Co-operation and Development. (2023). *Teacher digital competences: Formal approaches to their development*. In *OECD Digital Education Outlook 2023*. OECD Publishing. <https://doi.org/10.1787/c74f03de-en>
- Redecker, C. (2017). *European framework for the digital competence of educators: DigCompEdu*. Publications Office of the European Union. <https://doi.org/10.2760/159770>
- Suzer, E., & Koç, 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>
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425–478. <https://doi.org/10.2307/30036540>