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Digital Literacy Readiness and Technology-Supported Teaching Confidence among Elementary School Teachers

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ABSTRACT
This study examined digital literacy readiness and technology-supported teaching confidence among public elementary school teachers in the Schools Division Office of the City of Ilagan. A cross-sectional predictive correlational design was employed, with participants selected through multistage stratified random sampling. Data were collected using a validated questionnaire that demonstrated strong content validity and internal consistency. Descriptive statistics and partial least squares structural equation modeling were used to analyze the levels, measurement properties, relationships, and predictive contributions of the study variables. Results showed that teachers had high digital literacy readiness and technology-supported teaching confidence, with overall means of 3.68 and 3.51, respectively. Responsible and secure technology use received the highest readiness rating, while technical problem solving obtained the lowest. For teaching confidence, classroom delivery was rated highest, whereas responding to minor technical difficulties was rated lowest. Digital literacy readiness significantly predicted technology-supported teaching confidence, with a path coefficient of .684 and an explained variance of 46.8 percent. Pedagogical application and technical problem solving emerged as the strongest predictors of confidence. The findings indicated that teachers were generally capable of using digital tools, but they continued to experience difficulty in troubleshooting, digital assessment, and adapting technology to varied instructional needs. Sustained professional development, peer mentoring, technical assistance, and classroom-based technology integration activities were recommended to strengthen practical competence and confidence.

Keywords: *digital literacy, elementary education, pedagogical application, teacher confidence, technology integration, technical problem solving*

INTRODUCTION

Digital technology has become part of the ordinary work of teachers. Lesson preparation, instructional material development, assessment, communication, record keeping, and professional collaboration now involve various digital tools and platforms. These tools can make teaching more flexible and responsive, but their presence does not automatically lead to better instruction. Their educational value depends largely on whether teachers can choose appropriate resources, connect them with learning objectives, and use them with sound professional judgment. The Global Education Monitoring Report identified teacher preparation, access to technology, and proper governance as basic conditions for technology to support meaningful educational improvement. This places teachers' knowledge, skills, and confidence at the center of technology-supported education rather than treating devices and software as solutions by themselves (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2023).

Digital literacy readiness refers to more than the ability to operate a computer, open an application, or prepare a presentation. For teachers, it includes the capacity to locate and evaluate information, develop and adapt digital resources, communicate through appropriate platforms, protect personal and learner data, solve technical concerns, and select tools that serve clear instructional purposes. The European Framework for the Digital Competence of Educators organizes these abilities into professional engagement, digital resources, teaching and learning, assessment, learner empowerment, and the development of learners' digital competence. Falloon (2020) likewise explained that teacher digital competence must extend beyond technical skill to include pedagogical, ethical, personal, and professional considerations. Digital literacy readiness may therefore be understood as a teacher's preparedness to use technology responsibly, critically, and purposefully in daily educational practice.

These abilities carry particular importance in elementary education. Elementary school teachers handle learners who differ in reading ability, attention, language development, prior experience, and access to digital resources. Technology use at this level must be developmentally appropriate and carefully guided. Teachers need to judge whether a digital activity supports understanding, whether instructions are manageable for young learners, and whether the material protects children from unsafe or unsuitable content. They must also decide when technology can improve participation and when direct instruction, printed materials, play, discussion, or hands-on work would better serve the lesson. Digital literacy readiness among elementary school teachers is therefore reflected not by frequent technology use alone, but by the quality of the decisions made before, during, and after its use.

The Philippine Professional Standards for Teachers recognizes the positive use of information and communication technology as part of competent teaching practice. It expects teachers to apply professional knowledge, respond to learner diversity, use suitable teaching resources, and continue developing their practice across their career stages. These expectations show that digital capability is tied to broader responsibilities for instructional quality, inclusion, and professional growth. The Basic Education Development Plan 2030 further identifies quality, equity, access, resiliency, and effective governance as major directions for Philippine basic education. Meeting these directions requires education personnel who are competent, adaptable, and supported through continuing development. Within public elementary schools, digital literacy should therefore be examined as a professional readiness concern rather than as a narrow measure of computer familiarity (Department of Education, 2017, 2022).

Possessing digital knowledge, however, does not always mean that a teacher feels prepared to use it during instruction. Technology-supported teaching confidence refers to a teacher's belief in his or her ability to select, manage, adapt, and apply digital tools while maintaining clear learning goals. It includes confidence in preparing technology-based materials, guiding learners through digital activities, resolving minor technical difficulties, using technology for assessment, and adjusting instruction when a tool does not work as expected. A teacher may know how an application functions but still hesitate to use it in a lesson because of concerns about classroom management, learner participation, time, or possible technical failure. Confidence is therefore closely connected with action because it affects whether teachers are willing to attempt, continue, and improve technology-supported teaching.

Research has shown that digital competence and confidence are closely related, although they should not be treated as identical. Lucas et al. (2021) found that confidence in using digital technology, openness to new tools, ease of use, and the number of tools used for teaching were associated with the digital competence of in-service teachers. Peng et al. (2024) also reported that self-efficacy, attitudes, and digital competence influenced teachers' integration of information and communication technology. These findings suggest that teachers are more likely to make purposeful use of technology when they possess both the required capabilities and a firm belief that they can apply those capabilities in real teaching situations. Skills without confidence may remain unused, while confidence without adequate preparation may result in limited or unsuitable instructional practices.

Teachers' readiness and confidence may also differ according to their professional experiences and working conditions. Exposure to useful training, opportunities to practise, access to functioning equipment, support from school leaders, and collaboration with colleagues can shape how teachers view and use technology.

Gudmundsdottir and Hatlevik (2018) found that completing teacher education did not necessarily ensure that newly qualified teachers felt adequately prepared for the professional use of digital technology. A systematic review by Fernández-Batanero et al. (2022) likewise pointed to the continuing need for professional development that combines technological knowledge with pedagogical application. The Organisation for Economic Co-operation and Development noted that teacher standards are more meaningful when they are supported by accessible training, professional recognition, and a wider school system that encourages digital development. Digital readiness should therefore be supported through sustained learning and practical assistance rather than through one-time training alone.

The connection between digital literacy readiness and technology-supported teaching confidence deserves focused examination among elementary school teachers. International frameworks offer valuable descriptions of digital competence, yet teachers work under different conditions involving available resources, school support, learner needs, connectivity, and professional learning opportunities. Findings from other educational systems cannot be assumed to represent the experiences of elementary teachers in the Schools Division Office of the City of Ilagan. Examining the two variables together can provide a clearer account of whether teachers who demonstrate stronger readiness also report greater confidence in using technology for instruction. Thus, the study seeks to determine the levels of these two professional attributes and examine their relationship. Its findings may guide the development of training, technical assistance, peer support, and school-based initiatives suited to the actual needs of elementary school teachers.

Literature Review

Digital Literacy Readiness as a Professional Competence

Digital literacy readiness among teachers is a combination of technological ability, pedagogical judgment, ethical awareness, professional participation, and willingness to adapt to changing instructional demands. It should not be measured only through familiarity with computers or the number of digital applications a teacher can operate. Skantz-Åberg et al. (2022) found that professional digital competence has been described through several connected dimensions, including technical knowledge, pedagogical practice, professional development, critical understanding, and the responsible use of digital resources. These dimensions indicate that readiness becomes meaningful when teachers can apply digital knowledge to tasks that form part of their professional work. Tzafilkou et al. (2023) strengthened this view by developing an assessment instrument covering teaching preparation, lesson delivery, learner support, evaluation, professional growth, school development, and educational innovation. Their findings also showed that primary school teachers reported weaknesses in areas involving professional development and the digital support of teaching. Digital literacy readiness must therefore reflect a teacher’s ability to prepare materials, facilitate learning, assess progress, communicate responsibly, and improve instruction through suitable digital tools rather than merely demonstrate general technical familiarity (Skantz-Åberg et al., 2022; Tzafilkou et al., 2023).

Pedagogical Application of Digital Skills in Elementary Teaching

The value of teachers’ digital skills becomes clearer when those skills are translated into practices that respond to the learning needs of children. Elementary school teaching requires careful decisions about the suitability, simplicity, safety, and instructional purpose of digital activities because younger learners may need closer guidance when working with technology. Alptekin and Taneri (2025) found that primary school teachers used digital tools for lesson presentation, content production, classroom activities, and learner interaction, but their practices differed according to competence, experience, and the challenges encountered during instruction. Their work suggests that digital competence should be examined through what teachers actually do with technology and not only through self-reported technical knowledge. Runge et al. (2023) likewise established that teachers’ beliefs about their digital competence were positively associated with their reported use of technology for differentiation, learner engagement, classroom management, cognitive activation, and a supportive classroom climate. These findings show that digital literacy readiness should allow teachers to select tools based on instructional goals, adapt activities to learners' abilities, and maintain meaningful participation. For elementary teachers, effective digital practice is evident when technology helps clarify concepts, support varied learning needs, encourage active participation, and strengthen the quality of classroom instruction.

Technology-Supported Teaching Confidence

Technology-supported teaching confidence concerns teachers' belief that they can use digital resources successfully while handling the practical demands of instruction. Confidence influences whether teachers are willing to experiment with a tool, continue using it after difficulties, and revise their practices when an activity does not produce the intended result. Backfisch et al. (2021) found that teachers' technology use was connected with self-efficacy and the value they assigned to digital tools. Teachers who believed they were capable of integrating technology and viewed it as useful were more likely to include it in their teaching. Paetsch et al. (2023) also reported that information and communication technology literacy, general teacher self-efficacy, positive teaching experiences, and perceived support contributed to technology integration self-efficacy and changes in classroom technology use. These results clarify why digital competence and teaching confidence must be examined as related but separate qualities. A teacher may possess technical knowledge yet avoid technology-supported instruction because of concerns about mistakes, classroom control, limited time, or equipment failure. Conversely, confidence that is not supported by sufficient competence may lead to poorly chosen activities. Productive technology-supported teaching requires teachers who possess the necessary skills and trust their ability to use those skills under actual classroom conditions.

Professional Learning and School Conditions for Digital Teaching

Teachers' readiness and confidence are developed through continued practice within a school environment that provides guidance, resources, collaboration, and opportunities for professional learning. Access to devices is necessary, but equipment alone does not guarantee purposeful technology use. Sailer et al. (2021) found that teachers' basic digital skills and technology-related teaching skills were more strongly associated with the frequency and quality of classroom technology use than the availability of additional technological resources. Their results suggest that investments in equipment should be accompanied by efforts to strengthen teachers' practical and pedagogical abilities. Timotheou et al. (2023) similarly explained that a school's digital capacity depends on interconnected factors such as infrastructure, leadership, staff competence, professional development, policy direction, organizational culture, and collaboration among members of the school community. Teachers may be less confident when they receive technology without sufficient time to practise, technical assistance, instructional examples, or support from colleagues and school leaders. Professional learning should therefore be sustained, classroom-based, and responsive to the actual difficulties teachers encounter. Studying digital literacy readiness and technology-supported teaching confidence can help identify whether teachers require further training, peer mentoring, technical support, clearer school policies, or opportunities to design and evaluate technology-supported lessons together.

METHODS

Research Design

The study employed a cross-sectional predictive correlational design supported by partial least squares structural equation modeling. This design was selected because the investigation did not merely describe the levels of digital literacy readiness and technology-supported teaching confidence. It also examined whether digital literacy readiness significantly explained and predicted differences in teachers' confidence in using technology for instruction. Data were collected at one point in time without manipulating the participants' working conditions, access to digital resources, or teaching assignments. The predictive orientation allowed the study to determine which dimensions of digital literacy readiness contributed most strongly to technology-supported teaching

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confidence. Although directional relationships were tested, the design did not establish causation because no experimental intervention or temporal sequence was introduced.

Research Locale

The study was conducted in selected public elementary schools under the Schools Division Office of the City of Ilagan, Isabela. The locale included schools serving communities with varied levels of access to internet connectivity, digital devices, technical support, and professional development opportunities. These differences provided an appropriate setting for examining teachers' preparedness to use digital resources and their confidence in applying technology during instruction. The Schools Division Office of the City of Ilagan was chosen because elementary teachers within the division had been expected to perform technology-related tasks involving lesson preparation, classroom presentation, learner assessment, communication, reporting, and professional collaboration. Naguilian Baculud Elementary School served as the institutional base of the researcher during the conduct of the study.

Participants and Sampling Technique

The participants consisted of public elementary school teachers who were actively engaged in classroom instruction during the period of data collection. Teachers were considered eligible when they had rendered sufficient teaching service to provide informed responses concerning the use of technology for planning, instruction, assessment, communication, and professional responsibilities. Teachers who were on extended leave or were not handling instructional duties during the administration of the instrument were excluded.

A multistage stratified random sampling procedure was applied. Public elementary schools were first grouped according to geographic cluster and school classification to ensure that teachers from different working environments were represented. Schools were then selected through random procedures within each grouping. After the participating schools had been identified, eligible teachers were listed and randomly selected from each school. Proportional allocation was used so that schools with larger teaching personnel contributed a correspondingly larger share of participants. This procedure reduced the possibility that the findings would be dominated by teachers from only one school type or geographic area.

Research Instrument

Data were gathered through a structured questionnaire developed for the study. The instrument contained two major scales and did not include a section intended to describe the personal profile of the participants. The first scale measured digital literacy readiness through indicators involving digital information management, digital resource preparation, online communication and collaboration, responsible and secure technology use, technical problem solving, and pedagogical application. The second scale assessed technology-supported teaching confidence through indicators related to lesson design, classroom delivery, learner engagement, assessment, classroom management, adaptation of digital materials, and response to minor technical difficulties. Responses were recorded using a five-point scale ranging from a low degree to a very high degree of readiness or confidence.

The initial items were reviewed by specialists in educational technology, elementary education, research methodology, and measurement and evaluation. The validators examined the relevance, clarity, alignment, appropriateness, and completeness of each statement. Items that contained two ideas, vague technical language, or activities unsuitable for elementary teaching were revised or removed. The scale-level content validity index was .94 for digital literacy readiness and .95 for technology-supported teaching confidence, indicating strong agreement among the validators regarding the relevance of the instrument.

The revised questionnaire was pilot-tested among elementary school teachers from a nearby school division who were not included in the main data collection. The pilot responses were examined for unclear wording, response concentration, corrected item-total correlations, and internal consistency. The digital literacy readiness scale obtained a Cronbach's alpha coefficient of .92, while the technology-supported teaching confidence scale obtained a coefficient of .94. The complete instrument produced an overall Cronbach's alpha coefficient of .95. These coefficients indicated a high level of internal consistency without suggesting that the two scales measured exactly the same construct. Items with weak item-total relationships were reworded before the final administration.

Construct validity was further examined during the main analysis through indicator loadings, average variance extracted, composite reliability, and discriminant validity. Indicators with acceptable contributions to their assigned constructs were retained. The distinction between digital literacy readiness and technology-supported teaching confidence was assessed through the heterotrait-monotrait ratio to confirm that the two variables were related but empirically separate.

Data Gathering

Permission to conduct the study was secured from the appropriate officials of the Schools Division Office and from the school heads of the selected public elementary schools. After approval had been obtained, the researcher coordinated with designated school personnel regarding the appropriate schedule and mode of questionnaire administration. The purpose of the study, participation requirements, expected completion procedure, confidentiality safeguards, and voluntary nature of participation were explained before the questionnaires were distributed.

An informed consent form accompanied each questionnaire. Participants were informed that answering the instrument was voluntary and that they could decline or discontinue without penalty. No names, employee numbers, or information that could directly identify individual teachers were collected. Each accomplished questionnaire was assigned a code solely for monitoring retrieval and data encoding.

The questionnaire was administered through printed copies or a secured electronic form, depending on the accessibility and preference of the participating school. The same instructions and item sequence were used in both formats. Participants completed the questionnaire independently and were not required to discuss their responses with school heads, colleagues, or the researcher. Completed forms were checked only for missing responses and obvious duplication. Responses were then encoded, compared with the original entries, cleaned, and prepared for statistical analysis.

Data Analysis

The encoded data were first examined for incomplete responses, duplicate entries, inconsistent response patterns, and extreme multivariate observations. Missing values were handled according to their extent and pattern. Cases with substantial missing information were excluded, while isolated missing responses were addressed using an appropriate imputation procedure. Descriptive summaries were generated through the mean, standard deviation, median, and interquartile range. The simultaneous use of these measures allowed the study to present both the average response and the spread of the data without relying entirely on assumptions of normal distribution.

Partial least squares structural equation modeling was used as the principal statistical treatment. This technique was selected because digital literacy readiness and technology-supported teaching confidence were measured as multidimensional latent constructs composed of several observed indicators. It also allowed the study to assess measurement quality and predictive relationships within one analytical procedure.

The measurement model was evaluated through outer loadings, Cronbach's alpha, composite reliability, rho_A, and average variance extracted. Composite reliability values of at least .70 and average variance extracted values of at least .50 were treated as evidence of adequate reliability and convergent validity. Discriminant validity was examined through the heterotrait-monotrait ratio, with values below the accepted threshold supporting the distinction between the constructs.

The structural model was examined through path coefficients, coefficient of determination, effect size, and predictive relevance. Bootstrapping with 5,000 resamples was performed to obtain standard errors, confidence intervals, and probability values for the relationship between digital literacy readiness and technology-supported teaching confidence. Statistical significance was evaluated at the .05 level. The coefficient of determination showed how much variation in technology-supported teaching confidence was explained by digital literacy readiness, while the effect size indicated the practical contribution of each readiness dimension.

Predictive relevance was assessed through the Stone-Geisser Q^2 value, while out-of-sample predictive performance was examined using PLSpredict. An importance-performance map analysis was also conducted to identify digital literacy dimensions that combined high influence with comparatively lower performance. This procedure allowed the study to identify areas that could be prioritized in professional development, mentoring, and school-based technology support rather than limiting the interpretation to whether a significant relationship existed.

Ethical Consideration

The study observed the principles of voluntary participation, informed consent, privacy, confidentiality, fairness, and protection from harm. Participants received a clear explanation of the research purpose and the intended use of the findings before answering the questionnaire. They were informed that participation or nonparticipation would not affect their employment, performance evaluation, teaching assignment, promotion, or access to professional development opportunities.

The researcher avoided collecting personally identifying information that was not required by the study. Individual responses were not disclosed to school heads, supervisors, colleagues, or other participants. Findings were reported only in summarized form so that no teacher or school could be identified through the presentation of results. Electronic data were stored in a password-protected file, while printed materials were kept in a secured location accessible only to the researcher. Data were retained only for the period required for research verification and were disposed of securely afterward.

The researcher also maintained independence in the administration and interpretation of the study. Participants were not pressured to provide favorable responses concerning their digital competence, school resources, or confidence in using technology. Any possible professional relationship between the researcher and the participants was managed by emphasizing that there were no correct or preferred answers. The study was conducted only after the necessary institutional permissions and ethical requirements had been satisfied.

RESULTS AND DISCUSSION

Table 1. *Digital Literacy Readiness of Elementary School Teachers*

Dimension	Mean	Standard Deviation	Median	Interquartile Range	Interpretation
Digital information management	3.79	0.58	3.80	0.70	High
Digital resource preparation	3.72	0.61	3.75	0.75	High
Online communication and collaboration	3.88	0.55	3.90	0.60	High
Responsible and secure technology use	4.01	0.52	4.00	0.60	High
Technical problem solving	3.18	0.72	3.20	0.90	Moderate
Pedagogical application	3.49	0.66	3.50	0.80	High
Overall	3.68	0.51	3.70	0.60	High

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

The highest mean was recorded for responsible and secure technology use at 4.01. This result indicated that the teachers generally observed appropriate practices when protecting passwords, handling learner information, selecting online resources, and using digital platforms responsibly. Online communication and collaboration also received a high mean of 3.88, suggesting that teachers were comfortable using digital channels for professional communication, coordination, and resource sharing. These areas may have been strengthened by the routine use of messaging applications, electronic reports, learning platforms, and online professional activities.

Technical problem solving obtained the lowest mean of 3.18 and was the only readiness dimension interpreted as moderate. The larger standard deviation and interquartile range also showed greater differences among teachers in this area. Some teachers could independently resolve common difficulties, while others may have depended on colleagues or technical personnel when devices, applications, internet connections, or file formats failed. Pedagogical application obtained a mean of 3.49, which fell only slightly above the threshold for a high interpretation. This result suggested that teachers were generally able to use digital tools, but they were not equally prepared to connect those tools with differentiation, formative assessment, learner engagement, and developmentally appropriate elementary instruction.

The findings showed that functional familiarity with technology did not necessarily translate into advanced instructional readiness. Sailer et al. (2021) found that teachers' digital skills and technology-related teaching competencies were more closely associated with classroom technology use than the mere availability of equipment. The present pattern likewise suggested that access and routine use may have supported communication and basic resource preparation, while more demanding activities involving technical troubleshooting and pedagogical decision-making remained less developed.

Table 2. *Technology-Supported Teaching Confidence of Elementary School Teachers*

Dimension	Mean	Standard Deviation	Median	Interquartile Range	Interpretation
Technology-supported lesson design	3.69	0.62	3.70	0.70	High
Technology-supported classroom delivery	3.73	0.59	3.75	0.65	High
Digital learner engagement	3.61	0.65	3.60	0.80	High
Technology-supported assessment	3.29	0.73	3.30	0.90	Moderate
Technology-supported classroom management	3.58	0.67	3.60	0.80	High
Adaptation of digital materials	3.47	0.70	3.50	0.85	High
Response to minor technical difficulties	3.21	0.76	3.20	0.95	Moderate
Overall	3.51	0.56	3.50	0.70	High

Table 2 shows the level of technology-supported teaching confidence. The overall mean of 3.51 indicated that the teachers had a high level of confidence, although two dimensions remained at the moderate level.

Technology-supported classroom delivery obtained the highest mean of 3.73, followed by lesson design at 3.69. These findings indicated that teachers generally felt capable of preparing presentations, selecting digital materials, displaying lesson content, and using available platforms during classroom instruction. Digital learner engagement also received a high rating, suggesting that teachers believed they could use technology to attract attention, encourage participation, and provide varied learning activities.

Despite the high overall result, confidence in technology-supported assessment was moderate, with a mean of 3.29. Teachers may have been less certain about designing online assessments, interpreting electronically generated results, preventing inappropriate assistance, and providing timely digital feedback. Their confidence in responding to minor technical difficulties was also moderate, with the lowest mean of 3.21. The relatively high variability in these two dimensions suggested that confidence was not equally distributed across the teaching workforce. Teachers who had greater exposure to digital applications may have handled these tasks independently, while others may have avoided them because of concerns about errors, connectivity problems, lost responses, or interrupted lessons.

The findings supported the distinction between general technology use and confidence in handling demanding instructional tasks. Paetsch et al. (2023) reported that ICT literacy, teaching experience, self-efficacy, and perceived support contributed to teachers' technology integration. Runge et al. (2023) also found that digital competence-related beliefs were associated with the use of technology to strengthen classroom management, learner engagement, and instructional quality. The present results suggested that teachers had developed confidence in visible and frequently practised activities, such as lesson presentation, but remained less secure when technology required immediate troubleshooting, assessment design, and instructional adjustment.

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Table 3. *Reliability and Convergent Validity of the Measurement Model*

Construct	Outer Loading Range	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted
Digital information management	.701–.847	.872	.879	.903	.609
Digital resource preparation	.718–.861	.889	.894	.915	.643
Online communication and collaboration	.736–.875	.881	.887	.913	.677
Responsible and secure technology use	.722–.854	.865	.872	.901	.602
Technical problem solving	.708–.889	.907	.912	.929	.686
Pedagogical application	.714–.878	.919	.923	.936	.661
Technology-supported lesson design	.731–.866	.888	.892	.915	.643
Technology-supported classroom delivery	.744–.883	.901	.905	.925	.674
Digital learner engagement	.709–.871	.894	.899	.920	.658
Technology-supported assessment	.721–.892	.911	.916	.932	.696
Technology-supported classroom management	.703–.856	.878	.883	.909	.625
Adaptation of digital materials	.716–.884	.906	.910	.928	.684
Response to minor technical difficulties	.734–.899	.918	.922	.937	.712
Digital literacy readiness	.762–.891	.934	.938	.947	.748
Technology-supported teaching confidence	.773–.903	.946	.949	.956	.757

Table 3 presents the outer loading ranges, Cronbach's alpha coefficients, rho_A values, composite reliability coefficients, and average variance extracted values.

All retained indicators had outer loadings above .70. Cronbach's alpha coefficients ranged from .865 to .946, while composite reliability coefficients ranged from .901 to .956. These values demonstrated strong internal consistency across the dimensions and higher-order constructs. The average variance extracted values ranged from .602 to .757, exceeding the recommended minimum of .50. The constructs therefore accounted for more than half of the variance in their assigned indicators.

The results confirmed that the items consistently represented their intended dimensions without producing evidence of inadequate reliability. The high coefficients did not exceed levels that would clearly indicate unnecessary duplication of items. The measurement model was therefore considered suitable for evaluating the relationship between digital literacy readiness and technology-supported teaching confidence. The criteria followed the established evaluation procedures for reflective measurement models in PLS-SEM, including indicator reliability, internal consistency, and convergent validity (Hair et al., 2022).

Table 4. Heterotrait-Monotrait Ratios of Closely Related Constructs

Construct Pair	HTMT Value	Decision
Pedagogical application and technical problem solving	.842	Discriminant validity established
Lesson design and classroom delivery	.831	Discriminant validity established
Assessment and adaptation of digital materials	.824	Discriminant validity established
Classroom delivery and learner engagement	.817	Discriminant validity established
Classroom management and response to technical difficulties	.803	Discriminant validity established

Construct Pair	HTMT Value	Decision
Digital literacy readiness and technology-supported teaching confidence	.781	Discriminant validity established

The HTMT values for the closely related dimensions ranged from .781 to .842. None exceeded the conservative threshold of .85. Digital literacy readiness and technology-supported teaching confidence obtained an HTMT value of .781, showing that they shared meaningful variance but did not represent the same construct. This distinction supported the conceptual position that readiness involved the knowledge, judgment, and skills required for digital practice, while confidence concerned teachers' beliefs about their capability to perform technology-supported teaching tasks.

Establishing this distinction was important because an excessively high overlap would have weakened the interpretation of the structural relationship. The results allowed digital literacy readiness to be treated as a predictor and technology-supported teaching confidence as a separate outcome. The HTMT criterion was developed to detect discriminant validity problems that may not be identified adequately through older procedures such as cross-loading inspection and the Fornell-Larcker criterion (Henseler et al., 2015).

Table 5. Structural Model for Digital Literacy Readiness and Technology-Supported Teaching Confidence

Structural Path	Beta	Standard Error	t-value	p-value	95% Confidence Interval	f^2	Decision
Digital literacy readiness → Technology-supported teaching confidence	.684	.047	14.553	<.001	[.588, .768]	.879	Significant

Model Criterion	Value	Interpretation
R^2	.468	Moderate explanatory power
Adjusted R^2	.465	Moderate explanatory power
Q^2	.328	Predictive relevance established
Standardized root means square residual	.064	Acceptable approximate fit

Table 5 presents the structural relationship between the two higher-order constructs. The significance of the path coefficient was tested through bootstrapping with 5,000 resamples.Digital literacy readiness had a positive and statistically significant effect on technology-supported teaching confidence, with a standardized path coefficient of .684. The confidence interval did not contain zero, and the probability value was below .001. Teachers with stronger digital information skills, resource preparation abilities, communication practices, technical competence, and pedagogical application tended to report greater confidence in planning and conducting technology-supported instruction.

The coefficient of determination showed that digital literacy readiness explained 46.8 percent of the variance in technology-supported teaching confidence. This result represented meaningful explanatory power, but it also showed that 53.2 percent of the variance remained associated with factors outside the tested model. These factors may have included access to equipment, internet stability, previous training, availability of technical assistance, leadership support, workload, teaching assignments, and opportunities to practise technology-supported instruction. The large effect size of .879 indicated that removing digital literacy readiness from the model would substantially reduce its capacity to explain teaching confidence.

The positive relationship suggested that confidence was strengthened when teachers possessed usable and instructionally relevant digital abilities. It did not mean that readiness alone guaranteed effective technology-supported teaching. School conditions, professional support, and actual opportunities for classroom application continued to matter. Timotheou et al. (2023) emphasized that school digital capacity was shaped by interacting elements involving infrastructure, leadership, competence, professional development, collaboration, and organizational culture. The unexplained portion of teaching confidence in the present model supported the need to consider these broader conditions rather than placing the full responsibility for digital integration on individual teachers.

Table 6. *Specific Predictive Effects of Digital Literacy Readiness Dimensions*

Predictor	Beta	Standard Error	t-value	p-value	95% Confidence Interval	VIF	f²	Decision
Digital information management	.078	.051	1.529	.126	[-.021, .178]	1.684	.009	Not significant
Digital resource preparation	.163	.057	2.860	.004	[.052, .275]	1.917	.039	Significant
Online communication and collaboration	.116	.053	2.189	.029	[.012, .220]	1.573	.021	Significant
Responsible and secure technology use	.064	.049	1.306	.190	[-.032, .160]	1.461	.007	Not significant
Technical problem solving	.216	.054	4.000	<.001	[.111, .321]	2.086	.072	Significant
Pedagogical application	.301	.058	5.190	<.001	[.188, .414]	2.214	.118	Significant

Model Criterion	Value
R^2	.574
Adjusted R^2	.565
Q^2	.404

A dimension-level model was examined to identify the aspects of digital literacy readiness that made the strongest contributions to teaching confidence. The model explained 57.4 percent of the variance in technology-supported teaching confidence.

Pedagogical application emerged as the strongest predictor of technology-supported teaching confidence, with a beta coefficient of .301. Teachers who could connect technology with lesson objectives, learner differences, participation, assessment, and appropriate teaching strategies were more likely to feel capable of using technology during instruction. Technical problem solving was the second strongest predictor, with a coefficient of .216. The ability to respond to device, application, connectivity, and file-related difficulties appeared to reduce uncertainty and increase teachers' willingness to use technology in actual lessons.

Digital resource preparation and online communication and collaboration also contributed significantly, although their effect sizes were smaller. Digital information management and responsible and secure technology use did not have significant unique effects when the other readiness dimensions were entered simultaneously. This did not mean that these two areas were unimportant. Their descriptive means were among the highest, which may have limited their ability to explain differences in confidence. They may also have functioned as basic professional competencies rather than direct sources of confidence during technology-supported classroom instruction.

The results demonstrated that practical and pedagogical capabilities had greater predictive value than routine digital practices. Teachers may have known how to obtain information and follow digital safety procedures, but confidence increased more strongly when they could adapt technology to teaching and recover from technical disruption. This interpretation was consistent with findings showing that teachers' competence-related beliefs in differentiation and learner empowerment were associated with technology-supported instructional quality (Runge et al., 2023).

Table 7. *PLSpredict Results for Technology-Supported Teaching Confidence*

Outcome Dimension	Q²predict	PLS-SEM RMSE	Linear Model RMSE	RMSE Difference	Predictive Result
Lesson design	.331	.607	.623	-.016	PLS-SEM performed better
Classroom delivery	.358	.581	.595	-.014	PLS-SEM performed better
Learner engagement	.287	.648	.656	-.008	PLS-SEM performed better
Technology-supported assessment	.214	.706	.694	.012	Linear model performed better
Classroom management	.271	.661	.669	-.008	PLS-SEM performed better
Adaptation of digital materials	.245	.686	.699	-.013	PLS-SEM performed better
Response to minor technical difficulties	.196	.735	.721	.014	Linear model performed better

All Q²predict values were greater than zero, indicating that the model had predictive relevance for every dimension of technology-supported teaching confidence. The PLS-SEM model produced lower prediction errors than the linear benchmark for five of the seven outcome dimensions. The model therefore demonstrated moderate out-of-sample predictive power rather than only explaining relationships within the analyzed dataset.

The model showed weaker comparative prediction for technology-supported assessment and response to minor technical difficulties. These were also the lowest-rated dimensions in the descriptive results. Their prediction may have been affected by circumstances not fully captured by digital literacy readiness, such as the availability of suitable assessment systems, quality of internet access, school-level technical support, and the reliability of devices used during instruction. The result reinforced the view that confidence in these areas was shaped by both personal capability and environmental support.

PLSpredict was included because a statistically significant structural path did not automatically demonstrate that a model could predict observations outside its estimation sample. The procedure provided a more demanding assessment of predictive usefulness through holdout-based comparisons with a benchmark model (Shmueli et al., 2019).

Table 8. *Importance-Performance Map for Digital Literacy Readiness Dimensions*

Digital Literacy Readiness Dimension	Importance	Performance	Priority Interpretation
Pedagogical application	.301	62.3	Highest instructional priority
Technical problem solving	.216	54.5	Highest skills-support priority
Digital resource preparation	.163	68.0	Secondary development priority
Online communication and collaboration	.116	72.0	Maintain and strengthen
Digital information management	.078	69.8	Maintain
Responsible and secure technology use	.064	75.3	Maintain established practice

Pedagogical application combined the highest importance with only moderate performance. It represented the most valuable area for targeted intervention because improvements in this dimension were expected to produce the largest increase in technology-supported teaching confidence. Professional development should therefore move beyond demonstrations of applications and provide teachers with opportunities to design technology-supported lessons, differentiate activities, create meaningful assessment tasks, and evaluate whether a tool improved learning.

Technical problem solving had the lowest performance score and the second highest importance. This made it another urgent area for development. Teachers needed practical experience in resolving common difficulties involving internet connections, account access, projectors, file compatibility, audio and video settings, platform errors, and recovery of learner responses. School-based technical guides, peer assistance groups, demonstration sessions, and supervised practice could reduce dependence on a small number of technologically skilled personnel.

Responsible and secure technology use obtained the highest performance but had the smallest unique effect on teaching confidence. This dimension should be maintained, but it did not require the same level of immediate intervention as pedagogical application and technical problem solving. Importance-performance map analysis was valuable because it combined the statistical influence of each predictor with its current level of performance, allowing development priorities to be based on both need and potential effect (Ringle & Sarstedt, 2016).

CONCLUSION

The elementary school teachers generally demonstrated high digital literacy readiness and technology-supported teaching confidence, although notable weaknesses remained in technical problem solving, technology-supported assessment, adaptation of digital materials, and managing minor technical difficulties during instruction. Digital literacy readiness significantly predicted teaching confidence, with pedagogical application and technical problem solving emerging as the strongest contributors, which indicated that teachers became more confident when they could connect digital tools with lesson objectives and independently respond to common technological concerns. Based on these findings, schools should provide sustained and practice-oriented professional development that emphasizes technology-integrated lesson design, digital assessment, troubleshooting, learner engagement, and the adaptation of digital resources for varied elementary learning needs. School heads may also establish peer mentoring groups, technical assistance mechanisms, collaborative lesson planning sessions, and regular classroom-based demonstrations to strengthen teachers' practical competence. Adequate access to functional devices, stable connectivity, and responsive technical support should likewise be ensured so that teachers can apply their digital knowledge with greater consistency and confidence. Future studies may include other school divisions, examine additional organizational and personal factors, and use longitudinal or mixed-method approaches to explain how digital readiness and teaching confidence develop over time.

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