

Digital Presentation Skills and Self-Confidence in Integrating ICT Among Secondary School Mathematics Teachers

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digital professionalism, digital tools, online learning, technical quality, video-recorded lectures

Abstract. This study assessed teachers' digital presentation skills and self-confidence in integrating information and communication technology (ICT) for blended learning support and determined the relationship and variations of the different dimensions of these variables. The findings indicate that overall, teachers demonstrated very satisfactory or very high level of digital presentation skills, with Content Quality and Accuracy receiving the highest scores. Self-confidence in integrating ICT for blended learning was generally high, with School Technology Development scoring the highest among the dimensions. In terms of the levels of digital presentation skills, significant differences were observed between Content Quality and Instructional Quality, Content Quality and Technical Quality, Instructional Quality and Accuracy, Technical Quality and Accuracy, and Technical Quality and Delivery. In terms of self-confidence in integrating ICT, there were significant differences between Facilitate or Inspire and School Technology Development, Design and Development and School Technology Development, and Professional Growth and School Technology Development. When grouped by year level taught, significant differences were found in teachers' content quality and instructional quality in digital presentations. However, there were no significant variations in teachers' self-confidence levels across dimensions of integrating ICT when grouped by grade level. Additionally, notable negative correlations were observed between content quality and design and development, modeling digital professionalism, digital citizenship and responsibility, and professional growth. These findings serve as a basis for the development of a digital enhancement manual, focusing on improving teachers' digital skills in areas with lower ratings. This research aims to enhance the quality of digital teaching in secondary school mathematics, ultimately benefiting both educators and students.

Introduction

The COVID-19 pandemic significantly disrupted education worldwide and forced governments to implement measures to ensure public safety. In the Philippines, educational institutions were temporarily closed, affecting millions of students and teachers. To address these challenges, the Department of Education (DepEd) delayed the opening of classes and introduced policies aimed at protecting learners and educators while ensuring the continuity of education (DepEd, 2020; Romero, 2020). The pandemic accelerated the need for alternative learning approaches, leading to the adoption of blended learning as the primary strategy for instruction. Blended learning combined various delivery modes, including online learning, printed modules, radio and television-based instruction, limited face-to-face interaction, and the support of para-teachers (Esguerra, 2020). This shift represented a major transformation in the educational system, requiring schools, teachers, students, and parents to adapt to new teaching and learning practices. The integration of technology became essential in maintaining educational access and ensuring that learning could continue despite mobility restrictions and health concerns (Asio & Bayucca, 2020).

Blended learning and flexible learning emerged as critical educational approaches during the pandemic. These concepts emphasize the use of technology to support learning beyond the traditional classroom setting and provide learners with greater flexibility in accessing educational content. Blended learning combines face-to-face and technology-mediated

instruction (Graham & Dziuban, 2007), while flexible learning allows students to exercise varying levels of control over their learning pace, place, and pathway (Almpanis et al., 2010; Christensen et al., 2013). To support these approaches, DepEd implemented Alternative Delivery Modes (ADM), including DepEd Commons, an online learning platform designed to provide students with access to educational resources during school closures (DepEd, 2020). Furthermore, the Department strengthened technology integration through the DepEd Computerization Program (D.O. No. 78, s. 2020), which aimed to equip public schools with computers, software, and technical support to enhance teaching and learning processes. These initiatives reflected the government's commitment to addressing educational challenges through technological innovation and ensuring that schools remained responsive to the demands of modern education (Amit & Pineda, 2021).

The increased reliance on technology highlighted the importance of digital presentations and digital tools in education. Digital presentations became valuable instructional resources because they were easy to create, distribute, and utilize across different learning environments. Through multimedia elements such as slides, videos, audio narration, animations, and interactive features, digital presentations enhanced communication and student engagement (Saylor Academy, 2012). Effective presentations were found to depend on several key elements, including quality content, logical organization, appealing design, and effective delivery (Clark, 2015). At the same time, digital tools expanded opportunities for collaboration, communication, assessment, and resource sharing among teachers and learners (Ruiz & Garcia, 2020). Educational institutions increasingly recognized that technology integration was no longer optional but a necessary component of effective instruction. Consequently, teachers were expected to develop digital competencies that would enable them to create meaningful learning experiences and support student achievement in online and blended learning settings (Kong et al., 2014).

The effectiveness of blended learning largely depends on teachers' digital skills and self-confidence in integrating information and communication technology (ICT) into instruction. Research has shown that teachers' confidence in ICT contributes positively to teaching quality and learner outcomes (Shafeeq & Imran, 2016). Professional development programs, trainings, and workshops play a vital role in strengthening teachers' technological competencies and preparing them for evolving educational demands (Tomaro & Mutiarin, 2018; Zurita et al., 2015). Despite existing evaluation frameworks for educational resources, there remains a need to consider teacher delivery and communication skills alongside content and technical quality (DepEd, 2015; Mijares, 2023). Studies also highlight the potential of digital manuals and support materials in helping teachers develop effective presentations and instructional resources (Freauff, 2019; Shatri & Shala, 2022). Recognizing these needs, the study assessed secondary school mathematics teachers' digital presentation skills and self-confidence in supporting a blended learning environment. The findings served as the basis for the development of a digital enhancement manual and provided valuable insights for educational stakeholders, including policymakers, curriculum planners, school administrators, teachers, students, parents, and future researchers seeking to improve digital education practices and learning outcomes.

Research Objectives

Based on the aforementioned discussion, this study aimed to assess the digital presentation skills and ICT integration of secondary mathematics teachers. Specifically, the objectives of this study are:

1. To describe the secondary school mathematics teachers in terms of the following:
 - a. Level of digital presentation skills, in general, and in each of the dimensions below:
 - a.1 Content Quality
 - a.2 Instructional Quality
 - a.3 Technical Quality
 - a.4 Accuracy
 - a.5 Delivery
 - b. Level of self-confidence in integrating ICT to support blended learning, in general, and in each of the dimensions below:
 - b.1 Facilitate or Inspire
 - b.2 Design and Development
 - b. 3 Modeling Digital Professionalism
 - b. 4 Digital Citizenship and Responsibility
 - b. 5 Professional Growth
 - b. 6 School Technology Development
2. To determine significant differences in the teachers' levels across the following:
 - a. Dimensions of digital presentation skills
 - b. Dimensions of self-confidence in integrating ICT for supporting blended learning
3. To determine significant differences in the teachers' levels of each of the following constructs and their dimensions when the teachers are grouped by year level taught

- a. Digital presentation skills
- b. Self-confidence for supporting blended learning
4. To determine significant inter-relationships between the teachers' levels of digital presentation skills in general and in each of the dimensions, and the teachers' levels of self-confidence in integrating ICT in general and in each of the dimensions;
5. To propose a digital enhancement manual to enhance teachers' digital presentation skills in support of a blended learning environment in secondary school mathematics.

Statement of Null Hypotheses

1. There are no significant differences in the teachers' levels across the dimensions of digital presentation skills.
2. There are no significant differences in the teachers' levels across the dimensions of self-confidence for supporting blended learning.
3. There are no significant differences in the teachers' levels of digital presentation skills, in general and in each of the dimensions, when the teachers are grouped by grade level taught.
4. There are no significant differences in the teachers' levels of self-confidence in ICT integration for supporting blended learning, in general and in each of the dimensions, when they are grouped by grade level taught.
5. There are no significant inter-relationships between the teachers' levels of digital presentation skills, in general and in each of the dimensions, and their levels of self-confidence, in general and in each of the dimensions.

Methodology

Design

This research study utilized a mixed-method approach, particularly a sequential explanatory research design. Both quantitative and qualitative data were used to answer the problems, particularly in determining the digital presentation skills and the self-confidence of secondary mathematics teachers in integrating ICT to support blended learning. The quantitative data were gathered and analyzed. Qualitative data through document scanning was used to explain the findings from the quantitative data. Moreover, quantitative design was used particularly descriptive-comparative-correlational design. The study is descriptive as it assessed the levels of digital presentation skills and self-confidence in using digital tools of secondary mathematics teachers. Comparisons were done on the teachers' level across the different dimensions of digital presentation skills and dimensions of self-confidence for supporting blended learning. Also, the research determined the significant difference in the teachers' level of digital presentation skills and level of self-confidence, in general, and in each of the dimensions, when the teachers are grouped by grade level taught. Correlation design was used to determine significant inter-relationships between the teachers' levels of digital presentation skills, in general and in each of the dimensions, and the teachers' levels of self-confidence, in general and in each of the dimensions. Developmental design was used for the development of a digital enhancement manual.

In the qualitative part, the inter-raters provided detailed feedback and identified specific areas of strength and improvement in a way that considers the context and execution of each teacher's digital presentation. Moreover, the quantitative and qualitative data were analyzed to develop a design for a digital enhancement manual.

Research Environment

The research was conducted in selected public schools in the northern portion of the Schools Division of Nueva Vizcaya.

Research Respondents

The respondents of this study were the mathematics teachers of the three selected school districts including the Head Teachers and Master Teachers/Department Head as inter-raters of the digital presentation skills of the mathematics teachers. The study used a purposive sampling method since the study involved teachers who have recorded the presentation of their lessons.

Sources of Data

Recorded Presentations that were gathered from the teachers are lessons that were recorded before or during the pandemic. Most of the recorded lectures were also used during their classroom observation.

Research Instruments

Evaluation Rating Sheet for Non-Print Materials developed by DepEd (2015) was used to assess the presentation. The study adopted the four factors, namely: a) Content Quality, b) Instructional Quality, c) Technical Quality, d) Accuracy, and e) Delivery. The fifth component was added to address digital presentation skills. A four-point Likert scale was used with 4-Very Satisfactory, 3-Satisfactory, 2-Poor, 1-Not Satisfactory.

Confidence in Technology Integration adopted from Brown (2014) consists of 24 self-rated questions about teachers' self-confidence in technology integration. A four-point Likert scale was used with 1-Strongly Disagree, 2-Disagree, 3-Agree, and 4-Strongly Agree. The chosen tools directly measure teacher technology integration confidence related to the researcher's objectives.

The instruments were content validated by the researchers' adviser and two teachers from a state university who are experts in the field of mathematics and mathematics education.

Data Gathering Procedure

To gather the data needed for the study, the researcher first developed a personal data sheet to obtain information on the respondents' age, sex, highest educational attainment, grade level taught, and teaching experience. The Confidence in Technology Integration Tool developed by Brown (2014) was adopted to measure the respondents' self-confidence in integrating ICT. Permission to conduct the study was secured from the principals of the selected schools, and lists of secondary mathematics teachers were obtained to identify the respondents.

After securing the respondents' consent, the personal data sheet and questionnaire were administered either online or in person. The respondents also submitted their digital presentations or video-recorded lectures, which were evaluated by the Mathematics Department Head Teachers and Master Teachers using the DepEd Evaluation Rating Sheet for Non-Print Materials. The collected data were processed and analyzed using IBM SPSS Statistics software to answer the research questions and formulate conclusions and recommendations.

Based on the findings, a Digital Enhancement Manual was developed to improve teachers' digital presentation skills and self-confidence in integrating ICT. The development process involved analyzing the results, identifying areas with the lowest ratings, formulating objectives, creating illustrative guides, and designing the manual using Canva. The completed manual was published as a website and shared through a unique URL for easy access by teachers.

Treatment of Data

The data gathered from the respondents were organized, categorized, tallied, and treated statistically using the following: Frequency, percent, mean, and standard deviation were used to describe the respondents' digital presentation skills and self-confidence in using ICT.

Tables 1 to 3 show the levels of digital skills presentation and self-confidence in using ICT.

Rating	Response	Level of Digital Presentation Skills
3.50 – 4.00	Very Satisfactory	Very High
2.50 – 3.49	Satisfactory	High
2.50 – 2.49	Poor	Low
1.00 – 1.49	Not Satisfactory	Very Low

Table 1. Level of Digital Presentation Skills

Rating	Response	Level of Digital Presentation Skills
3.50 – 4.00	Errors Not Present	Very High
2.50 – 3.49	Errors Minimally Present	High
2.50 – 2.49	Errors Moderately Present	Low
1.00 – 1.49	Errors Present	Very Low

Table 2. Level of Digital Presentation Skills in terms of Accuracy

Rating	Response	Level of Self-Confidence
3.50 – 4.00	Strongly Agree	Very High
2.50 – 3.49	Agree	High
2.50 – 2.49	Disagree	Low
1.00 – 1.49	Strongly Disagree	Very Low

Table 3. Level of Self-Confidence in Using Digital Tools

The Shapiro-Wilks normality test for the different dimensions of digital presentation skills and self-confidence in integrating ICT produced p-values, which are mostly less than 0.05, indicating that the distributions are not normal. Thus, the non-parametric Friedman Test was used to determine the significant differences between the respondents' presentation skills and self-confidence in integrating ICT in terms of the different dimensions. The Wilcoxon signed-rank test was used as a post-hoc test to determine which dimensions are significantly different from each other with a Bonferroni adjustment on the significance level. Since there are 10 pairs from the five dimensions of digital presentation skills, the new significance level will be 0.005. There are 15 pairs from the six dimensions of self-confidence, making the new significance level equal to 0.003.

On the other hand, the Shapiro-Wilks normality test for digital presentation skills and self-confidence in integrating ICT in terms of grade level taught yielded p-values generally greater than 0.05, which indicate normal distribution of the variables and consequently allows the use of parametric tests. Repeated Measures ANOVA were used to determine the significant differences in the respondents' digital presentation skills across dimensions and teachers' self-confidence in integrating ICT across dimensions. One-way ANOVA was used to determine significant differences in teachers' levels across dimensions of digital presentation skills and the dimensions of self-confidence for supporting blended learning when the teachers are grouped by grade level taught. Post-hoc comparison of differences across dimensions of the dependent variables was also done. Meanwhile, the Spearman correlation coefficient was used to determine the interrelationships of digital presentation skills and self-confidence in ICT integration in the overall and dimension ratings.

The findings of this study were the basis for the development of a digital enhancement manual. The digital presentation skills with the lowest ratings were the foci of the content of the manual

Results and Discussion

The level of digital presentation skills in terms of Content Quality of the secondary school mathematics teachers was very high with an overall mean of 3.69. This means that the presentation of video-recorded lecture of the teachers was at a very satisfactory level according to the inter-raters. Among the items of digital presentation skills in terms of content quality, Item 6 (Content is free from cultural, gender, racial, or ethnic bias.) has the lowest rating.

According to the inter-raters' perception of the instructional quality of the digital presentation, the target users can control the rate and sequence of presentation at a very satisfactory level with an overall mean of 3.58. This suggests that the users had a reasonable level of control over how information or content was presented to them. It could be related to the pace of learning, navigation through a course, or some other interactive content. It appears that the feedback provided to the target users on their responses is also effectively employed and has been rated at a very satisfactory level. This implies that the feedback mechanism in place is not only satisfactory but also serves its purpose effectively.

The technical quality of the digital presentation of the secondary school mathematics teachers was high with an overall mean of 3.47. It uses accurate representations and is free from technical problems. Additionally, the audio, narration, and on-screen display contribute to an overall user-friendly experience. Research suggests that technical quality can sometimes be a concern, particularly with teacher-created materials or those developed with limited resources.

The video-recorded lectures exhibit a very high level of accuracy with an overall mean of 3.71, with minimal errors in terms of concepts, facts, grammar, and computational errors. The implication is that the digital presentation's accuracy and quality are commendable, fostering trust and credibility among the viewers. Similar results were obtained from teacher-respondents, along with experts in a study conducted by Manalastas and Leon (2021), who consistently found no serious errors in concepts, facts, grammar, typographical issues, or computations. The study highlighted that contents and facts were presented accurately with updated information, proper use of statistics, and correct computations. Paragraphs were meticulously checked to avoid grammatical errors and incorrect spelling. The absence of these conceptual, factual, and grammatical errors significantly contributes to the reliability of effective learning material.

Non-verbal and verbal delivery of the digital presentation was at a very high level with an overall mean of 3.63. The teacher demonstrated a pleasing personality, which contributed to a positive impression on the audience. The proper posture and consistent eye contact established a strong connection with the audience, fostering engagement and attentiveness throughout the presentation. Moreover, the teacher's verbal communication was found to be clear and easily understandable, enabling effective dissemination of information to the audience. By adopting an appropriate pace, the teacher successfully captured the audience's attention, maintaining their interest and focus on the subject matter. Additionally, the teacher exhibited a commendable sense of control over the delivery by using an optimal volume level, ensuring that all participants could hear and comprehend the content without any difficulty.

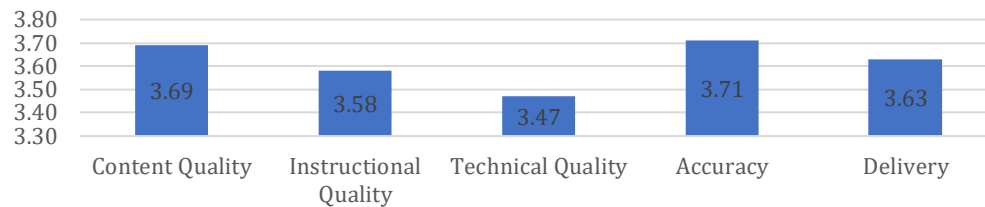


Figure 1. Mean Score in each Dimension of Digital Presentation Skills

Overall, the means of the dimensions presented in Figure 8 indicate that the teachers have very high level of digital presentation skills. The content and accuracy received higher scores, implying that the information shared was relevant, reliable, and well-organized. While instructional quality and delivery were also rated positively, technical quality received a slightly lower score, suggesting there might be some minor areas for improvement in the technical execution of the presentation. Nonetheless, the overall impression is that the digital presentation was well-received by the audience and demonstrated a commendable level of presentation skills.

Level of Self-Confidence

In terms of facilitating or inspiring, the teachers demonstrate a high level of self-confidence in integrating ICT to support blended learning with an overall mean of 2.99. Teachers feel more confident in understanding computer capabilities and using correct computer terminology. Whereas teachers need further development and support in evaluating software and mentoring students.

The level of self-confidence in integrating ICT to support blended learning in terms of design and development is also high with an overall mean of 3.06. Teachers feel confident in using the computer for instruction, teaching subject content with technology, selecting appropriate technology for instruction and assessment, and being responsive to students' needs during computer use. However, there are areas where teachers need to improve, such as effectively monitoring students' computer use for projects, regularly incorporating technology into lessons, and using technology resources for data collection and analysis.

In modeling digital professionalism, teachers feel comfortable using technology in their teaching and believe they can consistently employ educational technology effectively with an overall mean of 3.12. Additionally, they express confidence in being comfortable with technology use in the classroom. However, there is room for improvement in certain areas, such as assigning and grading technology-based projects.

In terms of digital citizenship and responsibility, the teachers are highly confident in providing individual feedback to students during technology use with an overall mean of 3.1. This suggests that they feel capable of offering personalized guidance and support to students while they engage with technology in the learning process. Additionally, they exhibit confidence in their continuous improvement—indicating that over time, they believe their skills in addressing students' technology needs will keep getting better.

As rated by the mathematics teachers, their level of self-confidence in using ICT for their Professional Growth is high with an overall mean of 3.01. Teachers also feel highly confident in developing creative ways to cope with system constraints and teaching effectively with technology. They have agreed that their confidence in integrating multiple technologies into their instruction was high. However, they perceive that integrating technology is not highly pertinent to their curriculum due to the time required for creating technology-based lessons.

The mathematics teachers' levels of self-confidence in integrating ICT for School Technology Development are also high with an overall mean of 3.23. Teachers are very highly confident in emphasizing the importance of ease of use and accessibility of technology in their classrooms. Additionally, teachers are aware of all the resources available to support successful technology integration in the classroom. This suggests that they have a good understanding of the available tools and support systems that can assist them in effectively using technology for teaching and learning purposes. This indicates that user-friendly and readily accessible technology is more likely to be utilized in their teaching practices. However, the individual also acknowledges that they tend to use technology more for personal purposes than in the classroom. This suggests that while they are comfortable with technology for personal use, they might need to find ways to bridge the gap and incorporate it more actively and effectively into their teaching practices.

The mean scores in the different dimensions of self-confidence in integrating ICT for supporting blended learning are presented in Figure 2.

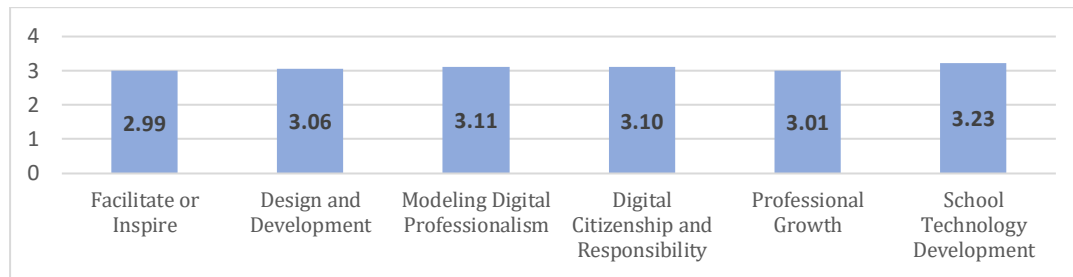


Figure 2. Mean Score in each of the Dimensions of Self-Confidence in Integrating ICT

Among the six dimensions, School Technology Development has the highest rating (mean = 3.23), while the rest have a mean score that ranges from 2.99 to 3.11. This implies that the teacher's self-confidence in integrating ICT is relatively high.

The above findings are similar to the findings of the study of Onalan and Kurt (2020), where participants' responses indicated a high level of self-confidence in integrating computers into their teaching. The majority of the participants said that they felt confident in selecting appropriate software to use in their instruction. Moreover, all participants showed confidence in designing technology-enhanced learning activities for their students.

Comparison in the Teachers' Digital Presentation Skills

Results of the Friedman test showed a significant difference in the teachers' levels of digital presentation skills across the different dimensions, $\chi^2(4) = 15.158$, $p = .004$. Therefore, the null hypothesis stating that there is no significant difference among the dimensions was rejected. Content Quality and Accuracy recorded the highest median scores ($Mdn = 3.75$), whereas Technical Quality had the lowest median score ($Mdn = 3.58$). The findings indicate that teachers excelled more in content-related aspects than in technical aspects of digital presentation.

Pair of Dimensions	Z	Asymp. Sig. (2-tailed)
Content Quality - Instructional Quality	-2.665 ^a	.008
Content Quality - Technical Quality	-3.268 ^a	.001*
Content Quality - Accuracy	-1.167 ^b	.243
Content Quality - Delivery	-.292 ^a	.770
Instructional Quality - Technical Quality	-1.586 ^a	.113
Instructional Quality - Accuracy	-2.262 ^b	.024
Instructional Quality - Delivery	-.911 ^b	.362
Technical Quality - Accuracy	-2.677 ^b	.007
Technical Quality - Delivery	-2.152 ^b	.031
Delivery - Accuracy	-.518 ^a	.605

a - Based on negative ranks.
b - Based on positive ranks.

Table 4. Wilcoxon Signed-Ranks Test Result for the Dimensions of Digital Presentation Skills

Pairwise comparison results from Table 4 using the Wilcoxon Signed-Ranks Test show that there is a significant difference only between content quality and technical quality. The teachers had a significantly higher rating in content quality than in technical quality. This suggests that teachers are confident of the quality of the content they are delivering but are less confident of their technical skills, for example, the use of tools, software, and presentation technology. This gap requires further support and training in technical skills to put them on par with the high quality of content that teachers already demonstrate.

Teachers rated content quality higher than instructional quality, implying that while they may be delivering valuable content, there is room for improvement in how this content is structured and delivered for learning effectiveness. The significant difference could indicate that teachers may view the content of the presentations as strong but have differing opinions on the instructional methods used. Also, content quality and technical quality have a significant difference which implies that teachers perceive the substance and relevance of the material differently from the technical aspects of the presentation.

Instructional quality was perceived to be significantly lower than accuracy. This suggests that while the information being presented is accurate, the teaching strategies or approaches to instruction could be enhanced. Teachers rated technical quality lower than accuracy, further underscoring the need for technical upskilling to ensure effective presentation and delivery of accurate information. A significant difference was found between technical quality and delivery, indicating that teachers believe their ability to deliver presentations is better than their technical execution.

However, based on the p-values which are greater than 0.05, there is no significant difference between Content Quality and Accuracy, Content Quality and Delivery, Instructional Quality and Delivery, and Accuracy and Delivery. On the other hand, there might be a potential difference between participants' perceptions of Instructional Quality and Technical Quality. This potential difference is not strong enough to be considered statistically significant with high confidence (p-value = 0.068), which is just above the conventional significance level of 0.05. As such, further investigation is needed to understand the nature of this potential difference better.

Comparison of the Teachers' Self-Confidence in Integrating ICT

Results of the Friedman test showed a significant difference in the teachers' levels of self-confidence in integrating ICT across dimensions, $\chi^2(5) = 20.552$, $p = .001$. School Technology Development had the highest mean rank (MR = 4.36), whereas Facilitate or Inspire had the lowest mean rank (MR = 2.72), indicating varying levels of teacher self-confidence across ICT integration dimensions.

The pairs of dimensions that are significantly different are found in Table 5.

Pair of Dimensions	Z	Asymp. Sig. (2-tailed)
Facilitate & Inspire – Design & Devt.	-1.064 ^a	.287
Facilitate & Inspire – Modeling Digital Prof.	-1.754 ^a	.079
Facilitate & Inspire – Digital Citizenship & Resp.	-1.752 ^a	.080
Facilitate & Inspire – Prof. Growth	-.259 ^a	.795
Facilitate & Inspire – School Tech. Devt.	-4.447 ^a	.000*
Design & Devt. - Modeling Digital Prof.	-.947 ^a	.344
Design & Devt. - Digital Citizenship & Resp.	-1.032 ^a	.302
Design & Devt. - Prof. Growth	-1.112 ^b	.266
Design & Devt. - School Tech. Devt.	-2.193 ^a	.028
Modeling Digital Prof. - Digital Citizenship & Resp.	-.797 ^b	.425
Modeling Digital Prof. - Prof. Growth	-1.327 ^b	.185
Modeling Digital Prof. - School Tech. Devt.	-1.254 ^a	.210
Digital Citizenship & Resp. - Prof. Growth	-1.639 ^b	.101
Digital Citizenship & Resp. - School Tech. Devt.	-1.796 ^a	.072
Prof. Growth - School Tech. Devt.	-2.618 ^a	.009
a - Based on positive ranks.		
b - Based on negative ranks.		
*Significant at 0.003.		

Table 5. Wilcoxon Signed-Ranks Test Result for the Dimensions of Self-Confidence in Integrating ICT

The p-value of less than 0.001 indicates that the observed difference between Facilitate or Inspire and School Technology Development is highly significant. The significant difference in perception between these two dimensions indicates that participants' views, attitudes, or experiences regarding facilitating or inspiring technology use in education are distinct from their perceptions of school technology development.

However, p-values greater than 0.05 for all comparisons indicate that there are no significant differences in teachers' levels of self-confidence across these dimensions of integrating ICT to support blended learning. This suggests that teachers' confidence in these aspects is relatively consistent, and there are no substantial variations across dimensions.

Comparison of Teachers' Levels of Digital Presentation Skills in terms of Grade Level Taught

A one-way analysis of variance (ANOVA) was conducted to determine whether teachers' levels of digital presentation skills differed according to grade level taught. It reveals that there are statistically significant differences in teachers' perceptions of both Content Quality, $F(4, 24) = 2.99$, $p = .040$, and Instructional Quality, $F(4, 24) = 4.37$, $p = .010$ in their digital presentations when they are grouped by grade level. These findings suggest that teachers' perspectives on the substance

and relevance of the material, as well as the effectiveness of their digital teaching methods, differ significantly depending on the grade or year level they taught. These highlight the importance of considering the specific characteristics and requirements of different grade levels when designing and delivering digital presentations. Understanding the variations in teachers' perceptions can help educators and school administrators provide targeted support and professional development opportunities to enhance digital teaching practices across various grade levels, ultimately leading to more effective and engaging learning experiences for students.

When comparing teachers' perceptions of Technical Quality, Accuracy, and Delivery in their digital presentations based on the grade level they teach, there are no statistically significant differences. This indicates that teachers' views on the technical aspects, precision of information, and delivery effectiveness do not significantly vary across different teaching levels. In conclusion, regardless of the grade or year level they handle, teachers maintain consistent perceptions of the technical aspects, accuracy, and delivery quality in their digital presentations. This finding suggests a level of uniformity in how teachers approach and execute these aspects in their digital teaching practices, ensuring a consistent and reliable learning experience for students across different grade levels.

Post hoc pairwise comparisons were conducted to identify the specific grade levels that differed significantly in terms of Content Quality and Instructional Quality. For Content Quality, significant differences were found between teachers handling Grade 7 and Grade 8 ($MD = 0.316, p = .010$), as well as between teachers handling Grade 8 and Grade 10 ($MD = -0.306, p = .013$). No other pairwise comparisons were statistically significant ($p > .05$). These findings indicate that teachers handling Grade 7 and Grade 10 reported significantly higher perceptions of content quality than those handling Grade 8.

For Instructional Quality, significant differences were observed between teachers handling Grade 7 and Grade 8 ($MD = 0.441, p = .001$), Grade 7 and Grade 9 ($MD = 0.385, p = .004$), and Grade 8 and Grade 10 ($MD = -0.241, p = .047$). No significant differences were found among the remaining grade-level pairs ($p > .05$). These results suggest that teachers handling Grade 7 perceived their instructional quality more favorably than teachers handling Grades 8 and 9, while teachers handling Grade 10 reported higher instructional quality than those handling Grade 8.

This study aligns with findings from the Trends in International Mathematics and Science Study (TIMSS) and the Progress in International Reading Literacy Study (PIRLS), which have shown that teacher quality and instructional methods significantly impact student outcomes across different educational levels. This research underscores the critical role of teacher quality and instructional methodologies in shaping student achievements across diverse educational tiers.

Comparison of the Teachers' Levels of Self-confidence in integrating ICT for supporting blended learning in terms of grade level taught

When the teachers were grouped according to the grade level they taught, the analysis of variance revealed no statistically significant differences in their levels of self-confidence in integrating ICT to support blended learning across all dimensions. Specifically, the dimensions of Facilitate or Inspire ($F = 0.29, p = 0.88$), Design and Development ($F = 0.80, p = 0.53$), Modeling Digital Professionalism ($F = 2.48, p = 0.07$), Digital Citizenship and Responsibility ($F = 0.65, p = 0.64$), Professional Growth ($F = 1.62, p = 0.20$), and School Technology Development ($F = 0.54, p = 0.71$) all obtained p-values greater than the 0.05 level of significance. These findings indicate that teachers' self-confidence in integrating ICT remains comparable regardless of the grade level they teach. Thus, the null hypothesis of no significant difference is accepted for all dimensions.

Studies such as those on TPACK training programs demonstrate that targeted professional development significantly enhances teachers' confidence and competence in using technology for instructional purposes. For example, Diamah et al. (2022) found that TPACK-based training programs led to significant improvements in teachers' technological integration skills and their overall perceptions of digital competence.

Overall, the results suggest that teachers' self-confidence in integrating technology to support blended learning is generally high and consistent across different dimensions and grade levels. This is a positive indication of their readiness to embrace technology in the classroom.

Significant relationships between the teachers' levels of digital presentation skills and levels of self-confidence in integrating ICT

The analysis revealed that among the dimensions of digital presentation, only Content Quality exhibited statistically significant negative correlations with several dimensions of teachers' self-confidence in integrating ICT. Specifically, Content Quality was significantly negatively correlated with Design and Development ($\rho = -0.431, p = .020$), Modeling Digital Professionalism ($\rho = -0.401, p = .031$), Digital Citizenship and Responsibility ($\rho = -0.468, p = .010$), and Professional Growth ($\rho = -0.460, p = .012$). These findings indicate that as ratings in Content Quality increase, self-confidence levels in these

particular dimensions tend to decrease. On the other hand, Content Quality showed no significant relationship with Facilitate or Inspire ($p = 0.041$, $p = .833$), School Technology Development ($p = 0.015$, $p = .937$), and Overall Self-confidence ($p = -0.360$, $p = .055$). Furthermore, all other dimensions of digital presentation skills—Instructional Quality, Technical Quality, Accuracy, Delivery, and Overall Digital Skills—were not significantly related to any dimension of self-confidence, as all obtained p-values greater than .05.

The negative correlation between content quality in digital presentations and digital citizenship and responsibility might indicate that teachers are aware of their limitations in creating high-quality digital content. This awareness can decrease from a lack of advanced training in digital content creation, as seen in studies that emphasize the need for comprehensive professional development. For instance, Diamah et al. (2022) found that targeted training significantly improved teachers' technological integration skills, suggesting that enhanced training in digital content creation could help bridge this gap.

Further investigation and understanding of the specific dynamics and factors influencing this negative correlation between Content Quality and Digital Citizenship and Responsibility are essential to inform strategies for fostering both content excellence and responsible digital behaviors in educational settings.

Furthermore, the correlation analysis between the overall levels of digital presentation skills and self-confidence in integrating ICT shows a non-significant relationship ($p = .528$).

In summary, the lack of significant correlations between the other dimensions of digital presentation skills and self-confidence in integrating ICT suggests that there may be other factors, experiences, or beliefs that play a more dominant role in shaping teachers' confidence levels in using technology in education. Understanding these additional factors could be essential for providing targeted support and professional development opportunities to enhance teachers' confidence and competence in integrating technology effectively into their teaching practices. While teachers' high self-confidence in integrating ICT is promising, the significant negative correlations with content quality and digital citizenship highlight specific areas that require attention. Enhancing training programs to focus on these areas can help bridge the gap, ensuring that teachers are well-equipped to create quality digital content and foster responsible digital behavior. By addressing these specific needs, educational institutions can better support teachers in providing comprehensive, high-quality digital education.

Proposed digital enhancement manual to enhance teachers' digital presentation skills in support of a blended learning environment in Secondary School Mathematics

The findings underscore the importance of creating a digital enhancement manual for teachers to address the challenges identified in integrating technology effectively into educational practices. Specifically, the negative correlation between content quality and teachers' confidence in design and development for ICT integration highlights the need for guidance on balancing content creation with the design of engaging technology-integrated learning experiences. Such a manual could provide strategies and resources for streamlining content creation processes while still prioritizing the development of innovative and effective instructional designs. Moreover, the negative correlation between content quality and teachers' confidence in modeling digital professionalism suggests the necessity of incorporating guidance on leveraging technology to foster digital professionalism in teaching practices. By offering insights and best practices for utilizing ICT tools and technologies to represent digital professionalism, the manual could empower teachers to integrate digital citizenship principles and ethical behaviors into their teaching effectively.

Furthermore, the manual could address the challenges identified in balancing content quality with the promotion of responsible digital citizenship among students. By providing strategies for integrating both aspects effectively, teachers can ensure that digital presentations not only deliver high-quality content but also foster responsible digital behaviors among students. Additionally, the manual could offer guidance on leveraging technology for professional growth while maintaining confidence in content creation and integration. By addressing the identified negative correlation between content quality and self-confidence in utilizing ICT for professional growth, the manual could equip teachers with the necessary strategies and resources to navigate the complexities of technology integration in their ongoing professional development endeavors. Overall, the creation of a comprehensive digital enhancement manual tailored to the specific needs and challenges identified in this research can serve as a valuable resource for supporting teachers in effectively integrating technology into their educational practices while promoting content excellence and responsible digital behaviors.

The proposed digital enhancement manual for secondary school mathematics teachers was developed based on the results presented in Section 1 and Section 2 using Canva website. The website was designed by the researcher with the purpose of guiding the Mathematics Teachers in making video presentations using PowerPoint Presentation. Canva is a versatile graphic design platform that can be effectively used to create manuals, providing a visually appealing and organized presentation of information. Canva's flexibility allows the creator to design manuals for both print and digital distribution,

catering to different needs and preferences. Whether the designer is creating an employee handbook, instructional guide, or any other type of manual, Canva provides the tools to make the process more accessible and visually appealing. Moreover, Canva provides a flexible platform suitable for teachers at various levels of digital presentation skills and self-confidence in integrating ICT. The key is to provide support and resources tailored to individual needs, fostering a culture of continuous learning and improvement.

The full manual can be accessed through <https://bit.ly/4eIYP1W>. The first four pages of the manual includes the title, what exactly a video lecture is, the resources, and the notes.

Conclusion and Recommendations

Conclusions

1. Teachers have generally very satisfactory or very high level of digital presentation skills, highest in Accuracy and lowest in Technical Quality.
2. The teachers' self-confidence in integrating ICT is generally high, highest in School Technology Development and lowest in Facilitate or Inspire.
3. The teachers' levels of digital presentation skills significantly differ in each pair of the following dimensions: Content Quality and Instructional Quality, Content Quality and Technical Quality, Instructional Quality and Accuracy, Technical Quality and Accuracy, and Technical Quality and Delivery.
4. The teachers' levels of self-confidence in ICT integration significantly differ in each pair of the following dimensions: Facilitate or Inspire and School Technology Development, Design and Development and School Technology Development, and Professional Growth and School Technology Development.
5. Teachers of different grade levels vary in their digital presentation skills in terms of Content Quality and Instructional Quality. While teachers' skills in terms of Technical Quality, Accuracy, and Delivery were the same across different grade levels.
6. Teachers' self-confidence in integrating ICT is at the same level regardless of the grade level taught.
7. Among the dimensions of digital presentation skills, only Content Quality showed a significant relationship with the dimension of self-confidence in integrating ICT which is Digital Citizenship and Responsibility.
8. The digital enhancement manual serves as their ultimate guide to crafting powerful presentations. It delves into step-by-step procedures for building effective presentations in PowerPoint. This digital manual offers a significant advantage over traditional paper manuals, especially for teachers creating video lessons using PowerPoint. Unlike a physical book, this online resource provides on-demand accessibility.

Recommendations

1. The teachers should equip themselves with the digital enhancement manual as their definitive guide to crafting impactful presentations. This comprehensive resource offers step-by-step procedures for creating effective digital presentations, empowering them to harness the full potential of PowerPoint.
2. Department heads should provide professional development and training programs to the teachers to learn and implement innovative strategies that may enhance teacher's overall quality of digital presentation skills.
3. School administrators and policymakers should continue to support and encourage the use of technology in the classroom. Providing access to technological resources and offering ongoing support for teachers can foster a positive environment for technology integration and enhance student learning experiences.
4. Teachers' effort should be made to enhance their abilities to develop engaging content and effective instructional methods in their digital presentations. Attending personalized training that considers the unique needs and challenges of each grade level can be beneficial.
5. Colleagues' continuous evaluation and reflection on teaching practices should be encouraged to ensure ongoing improvement and effectiveness in integrating technology and delivering digital presentations.
6. Supervisors should facilitate collaboration among educators to foster an environment of sharing best practices and innovative ideas related to digital presentation skills and technology integration.
7. Future researchers may conduct more research on this form on a broader scale and scope.

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Data Availability Statement

Data sharing is not applicable to this article as no new data were created or analyzed in this study; all data used were obtained from previously published sources as cited in the reference list.

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Appendices

No appendices are attached to this study.