

Teachers' Digital Competence

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Abstract:

The purpose of this descriptive qualitative research was to ascertain the digital competence of teachers during the school year 2021-2022 in one of the districts in the division of Bacolod City, Negros Occidental. The study surveyed 97 elementary online teachers from one of the district divisions of Bacolod City. The level of teachers' digital competence was determined using quantitative descriptive design. The findings indicated that most respondents were older, married, and possessed MA units or degrees. Most had over 14 years of teaching experience. Additionally, moderate and high levels of competence in application software and educational platforms were demonstrated, respectively, with an overall high level of competence. However, when grouped by age, civil status, and length of service, teachers' competence in both application software and educational platforms was "moderate." In contrast, those with higher educational attainment showed a "high" level of competence. Significant differences in digital competence across all demographic variables were found, with p-values below the significance level. Thus, the null hypothesis of no difference in digital competence across these groups was rejected, indicating that age, civil status, highest educational attainment, and length of service significantly influence teachers' digital competence.

Keywords: Application software, digital competence, educational platforms, teachers,

Introduction:

Nature of the Problem

In response to the COVID-19 crisis, the Department of Education (DepEd) implemented the Basic Education Learning Continuity Plan (BE-LCP) to ensure that learning continued safely through various modalities (DepEd Order No. 018, s. 2020). To meet the evolving needs of students during this period, teachers were required to attend training and seminars to enhance their digital skills. With society becoming increasingly connected to the digital environment, the pandemic dramatically shifted educational practices and the integration of technology into teaching. Teachers must now manage, manipulate, and incorporate digital tools into their teaching practices, adapting to new learning methods and building knowledge using these technologies.

The Technological Pedagogical Content Knowledge (TPACK) framework emphasizes the critical areas of knowledge needed for effective technology integration in the classroom. TPACK builds on Shulman's Pedagogical Content Knowledge (PCK) by incorporating technology, highlighting the intersection of technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK). Teachers must not only be proficient in using digital tools but also understand how to use these tools to enhance pedagogy and teach specific content effectively. The transition to e-learning, although challenging, can be made smoother with additional training for teachers, students, and parents to effectively use digital tools like learning management systems. The COVID-19 crisis reinforced the importance of teachers' digital competence in delivering distance learning and utilizing technology in education (Korisztek, 2022; Mishra & Koehler, 2006; Plitnichenko, 2020; Perifanou et al., 2021).

As a teacher, the researcher has noticed some distinctions in digital utilization between older and younger teachers. In the new normal, teacher digital competence plays a vital role in teaching and learning, where teachers cannot see their pupils and can only communicate with them using digital tools. The researcher wants to investigate the level of teachers' digital competence and recommend an intervention plan. This observation is accurate, and this is what prompted the researcher to conduct this study.

Current State of Knowledge

Digital competence refers to the knowledge, skills, and attitudes necessary for the safe and effective use of information and communication technology (ICT) in various aspects of life, including work, education, and social

participation (Sandhu, 2021). As society becomes increasingly digitized, digital competence is essential for accessing information, communication, and employability, supporting other key skills such as language, math, and science (Vuorikari, 2015). The COVID-19 pandemic further highlighted its importance, as over 1.2 billion children worldwide experienced school closures, leading to a surge in e-learning and reinforcing the long-term role of digital platforms in education (Li & Lalani, 2020).

Educational platforms enable flexible learning by organizing content, facilitating discussions, and allowing teachers to use diverse methods, such as video calls, forums, and online assessments, without time or space constraints (Lupion, 2020). Learning management systems (LMS) enhance online teaching by tracking student progress and providing analytics, though excessive data can overwhelm educators (Toderascu, 2020). Resistance to technology adoption among some teachers can hinder progress, limiting access to beneficial tools for specific subjects (Glaser, 2020). While technology integration in education has grown, many educators still struggle with implementation or resist its use (Toderascu, 2019). However, e-learning fosters continuous professional development, helping teachers refine their pedagogical approaches while automating administrative tasks (Yefremenko, 2021).

The rapid advancement of digital technologies has placed increasing demands on teachers, requiring them not only to adopt new tools but also to understand their broader cultural and political implications in education (Engen, 2019). Digital competence among educators varies, with some integrating technology effectively to enhance learning while others struggle with its pedagogical application (Käck et al., 2019). Despite widespread digitalization, professional development in ICT remains a challenge, emphasizing the need for continuous training to equip teachers with necessary skills (Artacho et al., 2021). The COVID-19 pandemic underscored the importance of online teaching, highlighting the necessity for creative, interactive, and user-friendly digital tools to ensure effective learning (Thomas, 2020). Teachers have shown resilience in adapting to the "new normal," utilizing social media and technology-assisted learning to overcome challenges and innovate classroom instruction (De Vera, 2020). Moving forward, investing in digital training and fostering adaptability will be crucial in preparing educators for an increasingly digital educational landscape.

The COVID-19 pandemic exposed significant challenges in online education, particularly in third-world countries, where inadequate internet bandwidth, costly data packages, and limited access hindered effective learning (Pokhrel & Chhetri, 2021). Policy-level intervention is necessary to improve affordability and accessibility, while educational tool developers must focus on customization for diverse economic backgrounds. Teachers' digital competence became essential, with many utilizing online tools for resource development, assessment, and communication but struggling with long-term planning and administration (Perifanou, 2021). Government policies promoting online learning were a necessary response, yet unpreparedness in infrastructure, teacher training, and parental support led to unequal implementation, as seen in Indonesia (Batubara, 2021). Research suggests that further exploration of suitable online pedagogies, authentic evaluations, and timely feedback mechanisms is needed for effective digital learning (Pokhrel & Chhetri, 2021). Additionally, teacher training programs emphasizing a blended learning approach—combining virtual platforms with face-to-face instruction—could create a more sustainable and effective learning environment, especially in EFL contexts (Nalliveetil et al., 2019).

The rapid growth of information and communication technologies (ICTs) has transformed education in the Philippines, prompting the Department of Education (DepEd) to incorporate digital tools like tablets, laptops, and e-learning resources into schools, while initiatives such as the Digital Rise Program aim to enhance teachers' digital skills (Umali, 2019; Madarang, 2022). Despite these efforts, challenges like outdated hardware, poor internet connectivity, and economic barriers remain, hindering equitable access, especially during the COVID-19 pandemic, which accelerated the adoption of online learning (Isla, 2020). The rise of educational technology (EdTech) has fostered innovative teaching methods, including social media-based learning on platforms like TikTok (Bautista, 2021). However, many schools still lack modern infrastructure, underscoring the need for continued investment in ICT resources (Obana, 2021). The pandemic highlighted the importance of ICT training for teachers and the development of digital competence, with studies showing that Filipino teachers, though using digital platforms, still prefer face-to-face teaching due to limited familiarity with digital tools (Alcontin, 2021; Paje et al., 2021). Effective digital education requires ongoing professional development, targeted training programs, and institutional support, with ICT competence and infrastructure investment being critical for future preparedness (Chin et al., 2022; Tria, 2020; Hodges et al., 2020).

Theoretical Underpinnings

The theoretical framework of this investigation was anchored on Punya Mishra and Matthew J. Koehler's "TPACK theory," or the Technological Pedagogical Content Knowledge framework, which was developed in the early 2000s. According to the TPACK framework, effective technology-based instruction necessitates the integration of these three knowledge areas. Technological Pedagogical Knowledge (TPK) describes how teaching and learning might alter when particular technologies are employed in specific ways. Next, Technological Content Knowledge (TCK) demonstrates how technology and content influence and constrain one another. Finally, pedagogical content knowledge (PCK) relates to teaching specific content using pedagogical methodologies appropriate for the content. The TPACK exists

at the junction of all three domains, indicating the comprehensive understanding required for teachers to blend technology into their teaching effectively and efficiently. This includes understanding where, when, and how to apply technology to improve learning experiences and outcomes. The TPACK framework emphasizes that teachers must not only know how to use technology (TK) but also grasp how technology can support pedagogical strategies (TPK) and content-specific teaching methods (TCK). This combined knowledge enables teachers to design successful and exciting learning environments.

Objectives

This study aimed to determine the level of teachers' digital competence in District VI for the school year 2021-2022 as the basis for an intervention plan. Specifically, it sought to answer the following question: 1) the level of teachers' digital competence according to the area of application software and educational platform; 2) the level of teachers' digital competence when grouped according to the aforementioned variables; and 3) the significant difference in the level of teachers' digital competence when grouped and compared according to the aforementioned variables.

Methodology

This section presents the discussion of the research methodology used, the subjects and respondents of the study, the research instruments used, the validity and reliability of the instruments, the procedure for data gathering, and the statistical tools and procedure for data analysis.

Research Design

This study will employ a descriptive research design to determine the teachers' digital competence. Descriptive research design is a type of research design that seeks to obtain information to depict a phenomenon, situation, or population systematically. More precisely, it assists in providing answers to the research problem's what, when, where, and how inquiries instead of its why. Numerous research techniques, such as the descriptive research method, can be employed to examine the variables. Although qualitative data can sometimes be used for descriptive purposes, quantitative data is typically its basis. This approach mainly uses quantitative data, occasionally adding qualitative data to enhance the phenomenon's description (McCombes, 2020). In this study, the researcher assessed teachers' digital competence in the Division of Bacolod City in the new normal. Thus, the descriptive method was the appropriate design for the study.

Study Respondents

The study's respondents will be the 97 teachers teaching online classes and are officially employed in District 6, Division of Bacolod City, during the school year 2021-2022.

Instruments

The study will use a self-made questionnaire to gather all the data needed for the research, mainly from teacher-respondents. The questionnaire was divided into two parts. The first was demographic information such as age, highest educational attainment, length of service, and civil status. The second part was the questionnaire, which consisted of 30 items that asked respondents to evaluate their competence in using application software and educational platforms. Fifteen items will measure application software competence, and fifteen will measure competence using educational platforms. Each item of the survey was measured on a standard Likert scale, a continuum of 1 to 5 with "1" representing "almost never," "2" representing "rarely," "3" representing "sometimes," "4" representing "often," and "5" representing "always." The instrument for data gathering was subjected to validity and reliability test. The average rating of the three jurors was used as basis for the validity of the instrument. Validation average is 4.89, interpreted as "excellent". This showed that the research instrument was "Valid". And the reliability result was 0.986, interpreted as "excellent".

Data Gathering Procedure

For the smoother conduct of the study, the researcher will employ the following procedures. A letter of request addressed to the school's division superintendent will be submitted to the division office. Upon approval, another letter of request addressed to the school head of Education and Training Center School I, Education and Training Center School II, and Education and Training Center School III, District 6, Division of Bacolod City, for the conduct of the study within the school will be submitted for approval. After approval, the questionnaires will be reproduced and distributed to the study respondents' teachers. The researcher personally distributes the questionnaires to the respondents to enable her to explain the purpose of the study and, at the same time, for the possible immediate retrieval of the same. The data gathered from the respondents' responses will be tallied and tabulated using the appropriate statistical tools. The raw data will be transformed into numerical code guided by a coding manual, allowing computer processing, statistical derivations, and tabular presentation. The computer program used to

process the encoded data is the Statistical Package for Social Sciences (SPSS). A collection of software applications bundled into one package is called SPSS. This program's primary use is analyzing scientific data about social science. Surveys, data mining, and market research can all be done with this data (Noels, 2018).

Data Analysis and Statistical Treatment

Objective No. 1 used descriptive and analytical schemes and mean to determine the teachers' digital competence regarding application software and educational platforms.

Objective No. 2 used descriptive and analytical schemes and mean to determine the teachers' digital competence levels when grouped and compared according to the aforementioned variables.

Objective No.3 used a comparative-analytical scheme and Mann-Whitney-U test to determine whether or not significant differences existed in teachers' digital competence in District VI, Division of Bacolod City when they were grouped and compared to the aforementioned variables.

Ethical Consideration

When doing research, it is critical to adhere to strict ethical standards to protect participants' welfare and maintain the study's integrity. Researchers must obtain informed permission from all participants to ensure a thorough grasp of the study's objectives, procedures, potential dangers, and benefits. Confidentiality and anonymity must be strictly enforced to safeguard participants' privacy and data confidentiality. Researchers should refrain from using deceit unless absolutely required and morally warranted after receiving approval from an institutional review board. Crucially, study activities should not cause harm to participants, and their involvement must be voluntary, with the option to withdraw at any time without consequences. Adherence to these ethical guidelines ensures the integrity and dependability of research findings. In every research study, protecting human subjects by applying suitable ethical norms is crucial. Due to the comprehensive nature of the study process, ethical considerations are especially relevant in qualitative research (Arifin, 2018).

Results and Discussion

This section deals with the presentation, analysis and interpretation of data gathered to carry out the objectives of this study. All these were made possible by following certain appropriate procedures so as to give the exact data and solution to each specific problem.

Table 1

Level of teachers' digital competence in the area of Application Software

Application Software Items	Mean	Interpretation
<i>As a teacher, I ...</i>		
1. create a video lesson suited to my learners through video editing applications. (We Video, Filmora, ...)	3.46	Moderate level
2. design posters, infographics, and presentations with publishing applications. (Canva, Adobe Spark, ...)	3.28	Moderate level
3. generate an APA references list, page breaks, and insert links through word processing software.	3.27	Moderate level
4. create video lessons with audio and video narration through presentation software such as PowerPoint.	3.98	High level
5. develop surveys, sign-ups, and feedback forms with Google Forms.	3.67	High level
6. use Google Drive to share files and other documents.	3.79	High level
7. construct advanced graphs and charts with Microsoft Excel.	3.57	High level
8. develop web applications to facilitate the completion of one or more tasks.	2.81	Moderate level
9. provide educational content for my learners through blogs.	2.98	Moderate level
10. develop wikis or Web sites to allow learners to contribute and modify one or more pages of school-related materials.	2.67	Moderate level
11. download files from the Internet and upload files to the e-mail.	4.08	High level
12. convert the printed content and activities in the modules to the digital form.	4.12	High level
13. design online quizzes and use them in teaching my classes (Kahoot, Quizizz, etc.).	3.16	Moderate level
14. publish my lessons and classroom activities on the web.	2.36	Low level
15. develop electronic learning activities that encourage my students to be critical thinkers.	3.63	High level
Overall mean	3.39	Moderate level

Table No. 1 shows that teachers' digital competence in application software has an overall mean of 3.39, indicating a "moderate level." The highest mean of 4.12 was for Item No. 12, where teachers convert printed content into digital form, reflecting a "high level." However, Item No. 14, which involves publishing lessons and activities online, had the lowest mean of 2.36, indicating a "low level" of competence. This suggests that while teachers are proficient in digital tools for converting materials, they rarely publish their lessons online. The overall mean of 3.56 for application software and educational platforms suggests that teachers can effectively use technology to enhance their teaching practices. This proficiency enables them to create interactive learning environments and meet diverse student needs. The study by Barron et al. (2021) highlights the importance of training, like the Edo-BEST program in Nigeria, which trained 11,000 teachers to use digital technologies effectively, emphasizing that technology can improve teacher-student engagement and learning outcomes through better access to content and networks.

Table 2

Level of teachers' digital competence in the area of Educational Platform

Educational Platform Items	Mean	Interpretation
<i>As a teacher, I ...</i>		
1. access various technological resources and tools such as LMSs, text, and video chat to deliver my lessons. (Google Classroom, Zoom, Google Meet, Microsoft Teams, Canva, Edmodo)	4.79	Very high level
2. understand the learning and teaching capabilities and limitations of these tools. (Black Board, Socrative, EdApp, Schoology, Microsoft Teams, Edmodo)	3.91	High level
3. am aware of the technical potential of, and procedures used to create, e-content, such as e-books and instructional videos used in my teachings.	3.42	Moderate level
4. am familiar with the technical capabilities and procedures of the various educational platforms that I use in my online classes. (Microsoft Teams, Zoom, Google Classroom, Edmodo)	4.02	High level
5. am aware of the most recent updates and renovations to the educational technology used in my online class.	3.81	High level
6. facilitate and maintain an interactive online discussion and information exchange with my learners. (Slido, Canva, Schoology, Zoom)	3.78	High level
7. connect with my learners instantly and set up channels geared toward separate topics with (Slack and Microsoft Teams)	3.09	Moderate level
8. quickly schedule online classes and video conferences for my learners.	4.07	High level
9. can quickly share files and websites and grade assignments for my online class through educational platforms such as (Black Board, Microsoft Teams, and Edmodo)	3.70	High level
10. can provide content to learners in a central location, communicate and provide grades in an electronic format to pupils. (Black Board, Microsoft Teams)	3.30	Moderate level
11. can contact my learners quickly through the communication tools of the LMSs (Proof Hub)	3.20	Moderate level
12. effectively and efficiently use various online educational platforms in my online classes. (Google Classroom, Zoom, Google Meet, Microsoft Teams, Canva, Edmodo)	4.11	High level
13. find educational platforms (Microsoft Teams, Edmodo, Google Classroom) that are easy to use.	4.05	High level
14. find it easy to store learners' assessments and attendance via educational online platforms. (Edmodo, Black Board)	3.39	Moderate level
15. find it easy to distribute online materials such as e-books and e-modules to my learners via educational platforms. (Canvas, Moodle)	3.34	Moderate level
Overall mean	3.73	High level

Table No. 2 reveals the teachers' digital competence in educational platforms, with an overall mean of 3.73, indicating a "high level." The highest mean of 4.79 was recorded for Item No. 1, which indicates that teachers extensively use technological tools like Google Classroom, Zoom, and Microsoft Teams for lessons. In contrast, Item No. 7, which involves using tools like Slack and Microsoft Teams to connect with learners, had the lowest mean of 3.09, suggesting moderate competence. The overall mean for application software and educational platforms was 3.56, reflecting a "high level" of competence, highlighting teachers' ability to use technology effectively in their teaching. This suggests they can create engaging learning environments, meet diverse student needs, and improve learning outcomes. However, the study by Ledder and Lonn (2014) indicates that many faculty members lack awareness of learning management system (LMS) library tools and their functions, with some not even aware of their availability, underlining the need for increased institutional awareness to boost usage and understanding of these tools.

Table 3

Level of teachers' digital competence in the area of Application Software and when grouped according to Age

Application Software		Age		
Items	Mean	Younger	Mean	Older
<i>As a teacher, I ...</i>				
1. create a video lesson suited to my learners through video editing applications. (We Video, Filmora, ...)	3.89	High level	3.19	Moderate level
2. design posters, infographics, and presentations with publishing applications. (Canva, Adobe Spark, ...)	3.89	High level	2.88	Moderate level
3. generate an APA references list, page breaks, and insert links through word processing software.	3.74	High level	2.97	Moderate level
4. create video lessons with audio and video narration through presentation software such as PowerPoint.	4.45	High level	3.68	High level
5. develop surveys, sign-ups, and feedback forms with Google Forms.	4.29	High level	3.27	Moderate level
6. use Google Drive to share files and other documents.	4.29	High level	3.47	Moderate level
7. construct advanced graphs and charts with Microsoft Excel.	4.21	High level	3.15	Moderate level
8. develop web applications to facilitate the completion of one or more tasks.	3.68	High level	2.25	Low level
9. provide educational content for my learners through blogs.	3.66	High level	2.54	Moderate level
10. develop wikis or Web sites to allow learners to contribute and modify one or more pages of school-related materials.	3.26	Moderate level	2.29	Low level
11. download files from the Internet and upload files to the e-mail.	4.63	Very high level	3.73	High level
12. convert the printed content and activities in the modules to the digital form.	4.63	Very high level	3.80	High level
13. design online quizzes and use them in teaching my classes (Kahoot, Quizizz, etc.).	3.61	High level	2.88	Moderate level
14. publish my lessons and classroom activities on the web.	2.82	Moderate level	2.07	Low level
15. develop electronic learning activities that encourage my students to be critical thinkers.	4.00	High level	3.39	Moderate level
Overall mean	3.94	High level	3.04	Moderate level

Table 3 reveals that younger teachers exhibit higher digital competence in application software (3.94, "high level") than older teachers (3.04, "moderate level"). Younger respondents excel in downloading/uploading files and converting printed content to digital form (4.63, "very high level"), while older respondents perform best in digital conversion (3.80, "high level"). Both groups struggle with publishing lessons online, with older respondents scoring particularly low (2.07, "low level"). Akyol et al. (2021) emphasize that websites enhance learning by integrating technology, highlighting the need for teachers to develop digital skills for effective education.

Table 4

Level of teachers' digital competence in the area of Application Software and when they are grouped according to Civil Status

Application Software		Civil Status		
Items	Mean	Single	Mean	Married
<i>As a teacher, I ...</i>				
1. create a video lesson suited to my learners through video editing applications. (We Video, Filmora, ...)	3.84	High level	3.15	Moderate level
2. design posters, infographics, and presentations with publishing applications. (Canva, Adobe Spark, ...)	3.77	High level	2.87	Moderate level
3. generate an APA references list, page breaks, and insert links through word processing software.	3.80	High level	2.83	Moderate level
4. create video lessons with audio and video narration through presentation software such as PowerPoint.	4.45	High level	3.58	High level

5. develop surveys, sign-ups, and feedback forms with Google Forms.	4.32	High level	3.13	Moderate level
6. use Google Drive to share files and other documents.	4.41	High level	3.28	Moderate level
7. construct advanced graphs and charts with Microsoft Excel.	4.02	High level	3.19	Moderate level
8. develop web applications to facilitate the completion of one or more tasks.	3.20	Moderate level	2.49	Low level
9. provide educational content for my learners through blogs.	3.16	Moderate level	2.83	Moderate level
10. develop wikis or Web sites to allow learners to contribute and modify one or more pages of school-related materials.	2.93	Moderate level	2.45	Low level
11. download files from the Internet and upload files to the e-mail.	4.52	Very high level	3.72	High level
12. convert the printed content and activities in the modules to the digital form.	4.48	High level	3.83	High level
13. design online quizzes and use them in teaching my classes (Kahoot, Quizizz, etc.).	3.64	High level	2.77	Moderate level
14. publish my lessons and classroom activities on the web.	2.82	Moderate level	1.98	Low level
15. develop electronic learning activities that encourage my students to be critical thinkers.	3.95	High level	3.36	Moderate level
Overall mean	3.82	High level	3.03	Moderate level

Table 4 shows that single teachers demonstrate higher digital competence in application software (3.82, "high level") than married teachers (3.03, "moderate level"). Single respondents excel in downloading and uploading files (4.52, "very high level"), while married respondents perform best in converting printed content to digital format (3.83, "high level"). Both groups struggle with publishing lessons online, with married teachers scoring particularly low (1.98, "low level"), likely due to unfamiliarity with online platforms. Alcontin (2021) highlights that Filipino teachers' digital competence depends on training programs, with many preferring face-to-face teaching due to limited familiarity with digital tools.

Table 5

Level of teachers' digital competence in the area of Application Software and when they are grouped according to Highest Educational Attainment

Application Software Items	Highest Educational Attainment			
	Mean	Lower	Mean	Higher
<i>As a teacher, I ...</i>				
1. create a video lesson suited to my learners through video editing applications. (We Video, Filmora, ...)	3.39	Moderate level	3.52	High level
2. design posters, infographics, and presentations with publishing applications. (Canva, Adobe Spark, ...)	3.17	Moderate level	3.36	Moderate level
3. generate an APA references list, page breaks, and insert links through word processing software.	3.10	Moderate level	3.39	Moderate level
4. create video lessons with audio and video narration through presentation software such as PowerPoint.	3.88	High level	4.05	High level
5. develop surveys, sign-ups, and feedback forms with Google Forms.	3.56	High level	3.75	High level
6. use Google Drive to share files and other documents.	3.71	High level	3.86	High level
7. construct advanced graphs and charts with Microsoft Excel.	3.05	Moderate level	3.95	High level
8. develop web applications to facilitate the completion of one or more tasks.	2.37	Low level	3.14	Moderate level
9. provide educational content for my learners through blogs.	2.29	Low level	3.48	Moderate level
10. develop wikis or Web sites to allow learners to contribute and modify one or more pages of school-related materials.	2.12	Low level	3.07	Moderate level

11. download files from the Internet and upload files to the e-mail.	3.66	High level	4.39	High level
12. convert the printed content and activities in the modules to the digital form.	3.66	High level	4.46	High level
13. design online quizzes and use them in teaching my classes (Kahoot, Quizizz, etc.).	2.66	Moderate level	3.54	High level
14. publish my lessons and classroom activities on the web.	1.61	Low level	2.91	Moderate level
15. develop electronic learning activities that encourage my students to be critical thinkers.	3.17	Moderate level	3.96	High level
Overall mean	3.03	Moderate level	3.66	High level

Table 5 shows that teachers with higher educational attainment have greater digital competence in application software (3.66, "high level") than those with lower attainment (3.03, "moderate level"). Both groups excel in converting printed content to digital format and creating video lessons, but struggle with publishing lessons online, with lower-educated teachers scoring significantly lower (1.61, "low level"). This suggests a lack of familiarity or training in online publishing. Artacho et al. (2021) emphasize that developing digital competence remains a key challenge for the educational community, highlighting the need for targeted digital training programs.

Table 6

Level of teachers' digital competence in the area of Application Software and when they are grouped according to Length of Service

Application Software		Length of Service		
Items	Mean	Shorter	Mean	Longer
<i>As a teacher, I ...</i>				
1. create a video lesson suited to my learners through video editing applications. (We Video, Filmora, ...)	3.98	High level	3.00	Moderate level
2. design posters, infographics, and presentations with publishing applications. (Canva, Adobe Spark, ...)	3.78	High level	2.82	Moderate level
3. generate an APA references list, page breaks, and insert links through word processing software.	3.72	High level	2.86	Moderate level
4. create video lessons with audio and video narration through presentation software such as PowerPoint.	4.59	Very high level	3.43	Moderate level
5. develop surveys, sign-ups, and feedback forms with Google Forms.	4.30	High level	3.10	Moderate level
6. use Google Drive to share files and other documents.	4.43	High level	3.22	Moderate level
7. construct advanced graphs and charts with Microsoft Excel.	4.02	High level	3.16	Moderate level
8. develop web applications to facilitate the completion of one or more tasks.	3.26	Moderate level	2.41	Low level
9. provide educational content for my learners through blogs.	3.48	Moderate level	2.53	Moderate level
10. develop wikis or Web sites to allow learners to contribute and modify one or more pages of school-related materials.	3.09	Moderate level	2.29	Low level
11. download files from the Internet and upload files to the e-mail.	4.61	Very high level	3.61	High level
12. convert the printed content and activities in the modules to the digital form.	4.67	Very high level	3.63	High level
13. design online quizzes and use them in teaching my classes (Kahoot, Quizizz, etc.).	3.61	High level	2.76	Moderate level
14. publish my lessons and classroom activities on the web.	2.72	Moderate level	2.04	Low level
15. develop electronic learning activities that encourage my students to be critical thinkers.	4.07	High level	3.24	Moderate level
Overall mean	3.89	High level	2.94	Moderate level

Table 6 shows that teachers with shorter service lengths have higher digital competence in application software (3.89, "high level") than those with longer service lengths (2.94, "moderate level"). Both groups excel in converting printed content to digital format, but struggle with publishing lessons online, with longer-serving teachers scoring lower (2.04, "low level"), likely due to unfamiliarity or approval delays. Zweig and Stafford (2016) highlight the need for targeted professional development to enhance teachers' online instruction skills, emphasizing the importance of training in digital content creation and student engagement in online learning environments.

Table 7

Level of teachers' digital competence in the area of Educational Platform and when they are grouped according to Age

Educational Platform Items	Age Mean	Younger	Mean	Older
<i>As a teacher, I ...</i>				
1. access various technological resources and tools such as LMSs, text, and video chat to deliver my lessons. (Google Classroom, Zoom, Google Meet, Microsoft Teams, Canva, Edmodo)	4.92	Very high level	4.71	Very high level
2. understand the learning and teaching capabilities and limitations of these tools. (Black Board, Socrative, EdApp, Schoology, Microsoft Teams, Edmodo)	4.39	High level	3.59	High level
3. am aware of the technical potential of, and procedures used to create, e-content, such as e-books and instructional videos used in my teachings.	3.89	High level	3.12	Moderate level
4. am familiar with the technical capabilities and procedures of the various educational platforms that I use in my online classes. (Microsoft Teams, Zoom, Google Classroom, Edmodo)	4.39	High level	3.78	High level
5. am aware of the most recent updates and renovations to the educational technology used in my online class.	4.32	High level	3.49	Moderate level
6. facilitate and maintain an interactive online discussion and information exchange with my learners. (Slido, Canva, Schoology, Zoom)	4.42	High level	3.37	Moderate level
7. connect with my learners instantly and set up channels geared toward separate topics with (Slack and Microsoft Teams)	3.97	High level	2.53	Moderate level
8. quickly schedule online classes and video conferences for my learners.	4.58	Very high level	3.75	High level
9. can quickly share files and websites and grade assignments for my online class through educational platforms such as (Black Board, Microsoft Teams, and Edmodo)	4.37	High level	3.27	Moderate level
10. can provide content to learners in a central location, communicate and provide grades in an electronic format to pupils. (Black Board, Microsoft Teams)	4.03	High level	2.83	Moderate level
11. can contact my learners quickly through the communication tools of the LMSs (Proof Hub)	3.76	High level	2.83	Moderate level
12. effectively and efficiently use various online educational platforms in my online classes. (Google Classroom, Zoom, Google Meet, Microsoft Teams, Canva, Edmodo)	4.68	Very high level	3.75	High level
13. find educational platforms (Microsoft Teams, Edmodo, Google Classroom) that are easy to use.	4.61	Very high level	3.69	High level
14. find it easy to store learners' assessments and attendance via educational online platforms. (Edmodo, Black Board)	3.95	High level	3.03	Moderate level
15. find it easy to distribute online materials such as e-books and e-modules to my learners via educational platforms. (Canvas, Moodle)	3.74	High level	3.08	Moderate level
Overall mean	4.27	High level	3.39	Moderate level

Table 7 shows that younger teachers have higher digital competence in educational platforms (4.27, "high level") than older teachers (3.39, "moderate level"), indicating greater proficiency among younger respondents. Both groups

excel in accessing technological tools for lesson delivery, but older teachers struggle more with interactive features, scoring lowest (2.53) in setting up communication channels. This suggests a need for better training and support for older teachers. Alcala et al. (2018) reinforce this, emphasizing that older adults often perceive digital technologies as difficult to use, highlighting the importance of user-friendly designs and tailored digital literacy programs.

Table 8

Level of teachers' digital competence in the area of Educational Platforms and when they are grouped according to Civil Status

Educational Platform Items	Civil Status Mean	Single	Mean	Married
As a teacher, I ...				
1. access various technological resources and tools such as LMSs, text, and video chat to deliver my lessons. (Google Classroom, Zoom, Google Meet, Microsoft Teams, Canva, Edmodo)	4.91	Very high level	4.70	Very high level
2. understand the learning and teaching capabilities and limitations of these tools. (Black Board, Socrative, EdApp, Schoology, Microsoft Teams, Edmodo)	4.05	High level	3.79	High level
3. am aware of the technical potential of, and procedures used to create, e-content, such as e-books and instructional videos used in my teachings.	3.32	Moderate level	3.51	High level
4. am familiar with the technical capabilities and procedures of the various educational platforms that I use in my online classes. (Microsoft Teams, Zoom, Google Classroom, Edmodo)	4.32	High level	3.77	High level
5. am aware of the most recent updates and renovations to the educational technology used in my online class.	4.14	High level	3.55	High level
6. facilitate and maintain an interactive online discussion and information exchange with my learners. (Slido, Canva, Schoology, Zoom)	4.02	High level	3.58	High level
7. connect with my learners instantly and set up channels geared toward separate topics with (Slack and Microsoft Teams)	3.43	Moderate level	2.81	Moderate level
8. quickly schedule online classes and video conferences for my learners.	4.48	High level	3.74	High level
9. can quickly share files and websites and grade assignments for my online class through educational platforms such as (Black Board, Microsoft Teams, and Edmodo)	4.09	High level	3.38	Moderate level
10. can provide content to learners in a central location, communicate and provide grades in an electronic format to pupils. (Black Board, Microsoft Teams)	3.61	High level	3.04	Moderate level
11. can contact my learners quickly through the communication tools of the LMSs (Proof Hub)	3.55	High level	2.91	Moderate level
12. effectively and efficiently use various online educational platforms in my online classes. (Google Classroom, Zoom, Google Meet, Microsoft Teams, Canva, Edmodo)	4.55	Very high level	3.75	High level
13. find educational platforms (Microsoft Teams, Edmodo, Google Classroom) that are easy to use.	4.45	High level	3.72	High level
14. find it easy to store learners' assessments and attendance via educational online platforms. (Edmodo, Black Board)	3.98	High level	2.91	Moderate level
15. find it easy to distribute online materials such as e-books and e-modules to my learners via educational platforms. (Canvas, Moodle)	4.02	High level	2.77	Moderate level
Overall mean	4.06	High level	3.46	Moderate level

Table 8 shows that single teachers have higher digital competence in educational platforms (4.06, "high level") than married teachers (3.46, "moderate level"). Both groups excel in accessing technological tools for lesson delivery but struggle with creating and distributing e-content, with married respondents scoring the lowest (2.77) in sharing

online materials. This suggests that married teachers may be less familiar with or trained in educational platforms. Balkaya and Akkucuk (2021) support this, emphasizing that e-learning self-efficacy strongly influences LMS adoption, highlighting the need for training to improve teachers' confidence and ease of use.

Table 9

Level of teachers' digital competence in the area of Educational Platforms and when they are grouped according to Highest Education Attainment

Educational Platform Items	Highest Educational Attainment			
	Mean	Lower	Mean	Higher
<i>As a teacher, I ...</i>				
1. access various technological resources and tools such as LMSs, text, and video chat to deliver my lessons. (Google Classroom, Zoom, Google Meet, Microsoft Teams, Canva, Edmodo)	4.71	Very high level	4.86	Very high level
2. understand the learning and teaching capabilities and limitations of these tools. (Black Board, Socrative, EdApp, Schoology, Microsoft Teams, Edmodo)	3.56	High level	4.16	High level
3. am aware of the technical potential of, and procedures used to create, e-content, such as e-books and instructional videos used in my teachings.	3.32	Moderate level	3.50	High level
4. am familiar with the technical capabilities and procedures of the various educational platforms that I use in my online classes. (Microsoft Teams, Zoom, Google Classroom, Edmodo)	3.41	Moderate level	4.46	High level
5. am aware of the most recent updates and renovations to the educational technology used in my online class.	3.32	Moderate level	4.18	High level
6. facilitate and maintain an interactive online discussion and information exchange with my learners. (Slido, Canva, Schoology, Zoom)	3.20	Moderate level	4.21	High level
7. connect with my learners instantly and set up channels geared toward separate topics with (Slack and Microsoft Teams).	2.59	Moderate level	3.46	Moderate level
8. quickly schedule online classes and video conferences for my learners.	3.46	Moderate level	4.52	Very high level
9. can quickly share files and websites and grade assignments for my online class through educational platforms such as (Black Board, Microsoft Teams, and Edmodo)	3.02	Moderate level	4.20	High level
10. can provide content to learners in a central location, communicate and provide grades in an electronic format to pupils. (Black Board, Microsoft Teams)	2.59	Moderate level	3.82	High level
11. can contact my learners quickly through the communication tools of the LMSs (Proof Hub)	2.51	Moderate level	3.70	High level
12. effectively and efficiently use various online educational platforms in my online classes. (Google Classroom, Zoom, Google Meet, Microsoft Teams, Canva, Edmodo)	3.61	High level	4.48	High level
13. find educational platforms (Microsoft Teams, Edmodo, Google Classroom) that are easy to use.	3.51	High level	4.45	High level
14. find it easy to store learners' assessments and attendance via educational online platforms. (Edmodo, Black Board)	2.88	Moderate level	3.77	High level
15. find it easy to distribute online materials such as e-books and e-modules to my learners via educational platforms. (Canvas, Moodle)	2.63	Moderate level	3.86	High level
Overall mean	3.22	Moderate level	4.11	High level

Table 9 shows that teachers' digital competence in educational platforms varies by educational attainment, with those having higher attainment scoring 4.11 ("high level") and those with lower attainment scoring 3.22 ("moderate level"). Both groups excelled in accessing technological tools for lesson delivery, but struggled with communication tools, particularly lower-attainment teachers, who scored 2.51 in using LMS communication features. This suggests a lack

of training in educational platforms, aligning with Sibiri and Aduko (2022), who found that trainee teachers were often unfamiliar with LMS tools due to insufficient training, leading to reduced usage and motivation.

Table 10

Level of teachers' digital competence in the area of Educational Platform and when they are grouped according to Length of Service

Educational Platform Items	Length of Service		Mean	Lower
	Mean	Shorter		
As a teacher, I ...				
1. access various technological resources and tools such as LMSs, text, and video chat to deliver my lessons. (Google Classroom, Zoom, Google Meet, Microsoft Teams, Canva, Edmodo)	4.93	Very high level	4.67	Very high level
2. understand the learning and teaching capabilities and limitations of these tools. (Black Board, Socrative, EdApp, Schoology, Microsoft Teams, Edmodo)	4.33	High level	3.53	High level
3. am aware of the technical potential of, and procedures used to create, e-content, such as e-books and instructional videos used in my teachings.	3.89	High level	3.00	Moderate level
4. am familiar with the technical capabilities and procedures of the various educational platforms that I use in my online classes. (Microsoft Teams, Zoom, Google Classroom, Edmodo)	4.48	High level	3.61	High level
5. am aware of the most recent updates and renovations to the educational technology used in my online class.	4.30	High level	3.37	Moderate level
6. facilitate and maintain an interactive online discussion and information exchange with my learners. (Slido, Canva, Schoology, Zoom)	4.20	High level	3.41	Moderate level
7. connect with my learners instantly and set up channels geared toward separate topics with (Slack and Microsoft Teams)	3.76	High level	2.49	Low level
8. quickly schedule online classes and video conferences for my learners.	4.63	Very high level	3.57	High level
9. can quickly share files and websites and grade assignments for my online class through educational platforms such as (Black Board, Microsoft Teams, and Edmodo)	4.33	High level	3.14	Moderate level
10. can provide content to learners in a central location, communicate and provide grades in an electronic format to pupils. (Black Board, Microsoft Teams)	3.98	High level	2.69	Moderate level
11. can contact my learners quickly through the communication tools of the LMSs (Proof Hub)	3.74	High level	2.71	Moderate level
12. effectively and efficiently use various online educational platforms in my online classes. (Google Classroom, Zoom, Google Meet, Microsoft Teams, Canva, Edmodo)	4.65	Very high level	3.63	High level
13. find educational platforms (Microsoft Teams, Edmodo, Google Classroom) that are easy to use.	4.59	Very high level	3.57	High level
14. find it easy to store learners' assessments and attendance via educational online platforms. (Edmodo, Black Board)	3.98	High level	2.86	Moderate level
15. find it easy to distribute online materials such as e-books and e-modules to my learners via educational platforms. (Canvas, Moodle)	3.0	High level	2.92	Moderate level
Overall mean	4.24	High level	3.28	Moderate level

Table 10 presents teachers' digital competence in educational platforms based on length of service, showing that those with shorter service scored higher (4.24, "high level") than those with longer service (3.28, "moderate level"). Both groups demonstrated a "very high level" in accessing technological tools for lesson delivery, but those with longer service struggled more with communication and collaboration tools, scoring lowest in setting up topic-based channels (2.49, "low level"). This suggests a lack of training in educational platforms for more experienced teachers. Lapada et al. (2020) support this, highlighting that while teachers were aware of COVID-19's impact and willing to adopt distance learning, they lacked the necessary facilities, equipment, and training.

Table11

Differences in the Level of teachers' digital competence in the area of Application Software and when grouped according to variables

Application Software							
Variable	Category	N	Mean	Mann-Whitney U test	p-value	Sig level	Interpretation
Age	Younger	38	64.71	524.00	0.000	0.05	Significant
	Older	59	38.88				
Civil Status	Single	44	60.20	673.00	0.000	0.05	Significant
	Married	53	39.70				
Highest Educational Attainment	Lower	41	34.43	550.50	0.000	0.05	Significant
	Higher	56	59.67				
Length of Service	Shorter	46	62.05	572.50	0.000	0.05	Significant
	Longer	51	37.23				

Table 11 reveals significant differences in teachers' digital competence in application software based on age, civil status, highest educational attainment, and length of service, leading to the rejection of the null hypothesis. These findings highlight the need for targeted training, resource allocation, and support systems to enhance teachers' digital skills. Related studies support these results: Barron et al. (2021) emphasize the role of technology in social connectedness, Benti et al. (2019) link technology use to marital conflicts, and Dogan et al. (2020) stress that perceived technology skills influence teachers' software use, underscoring the importance of professional development. Additionally, Guillen-Gamez et al. (2021) highlight ICT training deficiencies, particularly among teachers with 15+ years of experience. Addressing these gaps ensures teachers can effectively integrate technology, ultimately improving student learning outcomes in a digital age.

Conclusions

The study revealed significant variations in teachers' digital competence across demographic variables, with a "moderate" proficiency in application software but a "very high" competence in educational platforms, leading to an overall "high" digital competence level. Factors such as age, civil status, highest educational attainment, and length of service significantly influenced teachers' digital skills, emphasizing the need for targeted training programs. Notably, teachers with higher educational attainment demonstrated greater digital competence, underscoring the impact of academic background. To address gaps, the study recommends conducting comprehensive training workshops on application software (e.g., Canva, Filmora, Kahoot, Quizizz) and educational platforms (e.g., Edmodo, Microsoft Teams, Google Classroom) to enhance teaching strategies and student learning experiences. Policymakers should collaborate with educational institutions to design accessible training modules and implement structured professional development programs. Further research is suggested to explore innovative approaches to improving teachers' digital competence and ensuring continuous skill development in an increasingly digital learning environment.

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