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DIGITAL COMPETENCIES OF PRIMARY SCHOOL TEACHERS IN THE NORTHERN MOUNTAINOUS AREAS OF VIETNAM

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ABSTRACT

To successfully implement digital transformation in education, adapting to the context of the 4th Industrial Revolution, teachers need to possess digital competencies. This article presents an assessment of the digital competencies of primary school teachers in the northern mountainous areas of Vietnam. The descriptive method is employed to analyze survey results. Based on the survey findings, the study reveals significant progress in integrating digital technology into the teaching process of teachers in this region. The majority of teachers (51%) have achieved the "Expert" (B2) level, demonstrating a proactive utilization of digital technology and deep expertise in this field. Additionally, 27% of teachers have reached the "Leadership" (C1) level, indicating their ability to guide their colleagues in the use of digital technology for teaching purposes. However, there is still a need to support and enhance the digital competencies of teachers at the "Integrated" (B1) and "Pioneer" (C2) levels, as well as those at the "Discovery" (A2) level who are in the process of exploring digital technology. The research findings serve as valuable information for educational managers to assess the digital competencies of primary school teachers, thereby informing appropriate support policies to develop teacher competencies and meet the requirements of educational program innovation. Furthermore, the study suggests future research directions to identify measures for enhancing the digital competencies of teachers

KEYWORDS: digital competencies, teacher, mountainous, Vietnam

1. INTRODUCTION

Digital transformation is advancing at a rapid pace due to the development of emerging technologies such as artificial intelligence and cloud computing [1]. The successful integration of digital transformation in education necessitates teachers to possess digital competence. Digital competence encompasses the safe, significant, and responsible utilization and interaction with digital technologies for learning, work, and societal engagement. It encompasses various domains, including knowledge of information and data, communication and collaboration, media literacy, digital content creation

(including programming), security (including skills related to digital well-being and cybersecurity), intellectual property issues, problem-solving, and critical thinking [2].

Durán argues that a teacher's digital competency comprises the knowledge, skills, and attitudes essential for effectively utilizing information technology across diverse aspects, such as technology, information, multimedia, communication, collaboration, ethics, as well as pedagogy—didactic principles for the effective integration of information technology into educational practice in formal or informal settings [3]. Cabero et al. highlight that digital competence is one of the key proficiencies that individuals, particularly teachers, must master in future society [4].

Teachers play a crucial and pivotal role in the process of technology integration and are instrumental in the application and implementation of information technology in the classroom. The transformation and improvement of education depend on educational actions, which necessitate teachers to possess effective digital competencies enabling them to integrate and utilize technology in a pedagogical manner [5]. The researchers' endeavors have been focused on several key issues, including research on developing a theoretical framework for teachers' digital competencies [6, 7]; providing an overview and conducting systematic research on teachers' digital competencies at the university level [5]; investigating the digital competencies of university lecturers [1]; and studying teachers' digital competencies). However, there is a scarcity of studies focusing on the digital competencies of primary school teachers. Therefore, this paper aims to assess the current state of digital competencies among primary school teachers in the northern mountainous areas of Vietnam. Subsequently, it aims to identify the strengths and limitations of primary school teachers in terms of digital competencies, with the objective of assisting education managers in formulating policies to develop human resources in the future.

2. METHODOLOGY

2.1. Participants

Table 1: Survey object information (n = 100)

Information		Amount	Proportion %
Gender	Male	10	10,0
	Female	90	90,0
Age	Under 25	3	3,0
	25 - 29	8	8,0
	30 - 39	35	35,0
	40 - 49	37	37,0
	Over 50	17	17,0
Experience	Under 5 years	7	7,0
	5 - 10	14	14,0
	11 - 15	22	22,0
	16 - 20	23	23,0
	Over 20	34	34,0
Level	Undergraduate	90	90,0
	Graduate	10	10,0
Total		100	100%

In terms of gender, the data sample exhibits a gender disparity, with males comprising 10% (n = 10) and females accounting for 90% (n = 90) of the participants. This gender distribution can be attributed to the lower representation of males in the primary school teaching profession compared to females. Regarding age, the participants were categorized as follows: under 25 (3%), 25 to 29 (8%), 30 to 39 (35%), 40 to 49 (37%), and over 50 (17%). These figures indicate that the age group between 30 and 49 years old constitutes the largest proportion of the data sample. In terms of seniority, the distribution is as follows: less than 5 years (7%), 5 to 10 years (14%), 11 to 15 years (22%), 16 to 20 years (23%), and over 20 years (34%). This suggests that the group with over 20 years of experience represents the largest proportion of the data sample. Regarding training level, the analysis reveals that 90% (n=90) of the participants held an undergraduate degree, while the remaining 10% (n=10) had completed a postgraduate degree.

2.2. Survey tools

The questionnaire utilized to evaluate teachers' numerical competencies in this study was sourced and modified from the work of Moreira et al. [8].

Table 2: Survey questions (n = 21)

Question 1	I use different electronic communication channels for different purposes.
Question 2	I am constantly exploring the use of digital technology.
Question 3	I participate in online training opportunities.
Question 4	I look at different sites and strategies for finding and selecting educational resources.
Question 5	I use technology and digital resources to work with colleagues inside and outside of school.
Question 6	I use various security mechanisms and software to protect personal content.
Question 7	I look at the measures, when, and whys to use digital technology most effectively.
Question 8	When teaching online, I always supervise student learning.
Question 9	In group discussions, students create and store digital technology products.
Question 10	I use digital technology to develop active teaching methods.
Question 11	I set up learning activities that involve creating digital content. For example, video, audio, images, digital presentations, blog, wiki,...
Question 12	I use digital technology to allow students to plan, record, and monitor their learning independently.
Question 13	I use electronic typing technology or tests and games to check students' progress and give more effective feedback.
Question 14	I use digital technology to give effective feedback.
Question 15	I regularly review available information to identify students who need additional support.
Question 16	When I create e-assignments for students, I consider and try to solve problems they may encounter when using the number format.
Question 17	I use digital technology to provide students with activities tailored to their level and learning needs.
Question 18	I teach students how to check if information is credible and how to identify false or fake information.
Question 19	I set up activities that require students to use digital technology to communicate with each other or with the community.
Question 20	I teach students to behave safely and responsibly when using the internet.
Question 21	I encourage students to use digital technology creatively to solve specific problems.

3. RESULTS

- The teacher's ability to use different electronic communication channels for different purposes:

The proficiency of teachers in utilizing various electronic communication channels for different purposes was examined. A small percentage (4%) of teachers reported actively reflecting upon, discussing, and enhancing their communication strategies. Although this figure is relatively low, it signifies a positive indication that teachers are aware of and dedicated to improving their digital communication skills. The majority of teachers (55%) demonstrated their initiative and commitment to enhancing communication effectiveness by selecting and combining different digital solutions. This proactive approach highlights teachers' efforts in developing their digital competencies to establish a more efficient communication environment. Approximately 25% of teachers integrated communication channels such as email, the organization's website, and basic blogs into their practices. Another 15% of teachers employed fundamental digital communication channels, primarily relying on email. Conversely, a mere 1% of teachers reported not utilizing any digital communication channels.

- Ability to learn about the teacher's use of digital technology.

The teachers' ability to acquire digital technology skills was examined. It was found that 9% of teachers struggle to develop their digital skills for teaching purposes. This highlights the need for significant

investment and support to enhance teachers' technological competence. A small percentage of teachers (8%) demonstrated improvement in their technology proficiency through reflective practices and experimentation. Additionally, a fraction (8%) of teachers utilized a variety of resources to enhance their digital teaching skills. This indicates their recognition of the importance of materials and resources for effectively understanding and implementing technology in teaching. However, most teachers (64%) engaged in discussions with colleagues to explore and implement digital technology for innovative and improved educational performance. This demonstrates their proactive approach in sharing knowledge and learning from others to enhance their technology skills and foster innovative teaching methods. Furthermore, 11% of teachers actively supported their colleagues in developing digital strategies during teaching. This highlights the collaborative and supportive nature among teachers in enhancing their technological competencies and fostering a shared learning environment.

- Ability of teachers to participate in online training opportunities

The survey results indicate that 2% of teachers considered online training as a new field that they had not previously explored. A small percentage (7%) of teachers expressed interest in and planned to participate in online training opportunities, demonstrating their recognition of the significance and potential of online training in enhancing their competence and knowledge. However, there is still a portion (8%) of teachers who rarely engage in online training opportunities. This suggests the need for support and encouragement to help teachers overcome barriers and actively participate in online training activities. A majority of teachers (44%) reported having tried some form of online training opportunity, highlighting their willingness and motivation to learn and explore online training to enhance their capacity and knowledge. Furthermore, over a third of teachers (39%) consistently engage in various types of online training, indicating their dedication and ongoing openness to self-development through online training opportunities.

- Ability to consider different sites and strategies for finding and selecting educational resources by teachers.

The data reveals that a negligible percentage (1%) of teachers rarely utilize the Internet for researching teaching resources. A significant number of teachers (27%) reported using search engines and educational platforms as their primary means of finding relevant resources. Similarly, 26% of teachers indicated that they assess and choose resources based on their appropriateness for students. This demonstrates a focus on ensuring that educational resources align with the specific needs and learning abilities of their students. Furthermore, 35% of teachers engage in resource comparison, employing various criteria such as quality, relevance, reliability, and other relevant factors. This signifies their interest in conducting thorough evaluations and selecting educational resources of high quality. Additionally, a portion of teachers (11%) actively provide guidance to their colleagues on appropriate research resources and strategies, further emphasizing their expertise and willingness to support their peers in this regard.

- Ability to use technology and digital resources to work with colleagues inside and outside the school.

The study examined teachers' collaboration opportunities and practices. Only a marginal percentage (1%) of teachers reported having limited opportunities to collaborate with their peers. However, a notable proportion of teachers (19%) indicated that they occasionally exchange materials with colleagues through email or other online communication channels. Furthermore, 24% of teachers reported engaging in collaborative work environments or utilizing shared folders to facilitate teamwork. More than half of the teachers (53%) actively participate in knowledge and resource exchange with educators beyond their own campuses, utilizing online teacher networks or collaborative platforms. This highlights their willingness and ability to collaborate and share knowledge within the broader teacher community. A small percentage of teachers (4%) also engage in co-creating materials with teachers from different institutions within the digital network. This demonstrates their adoption of technology and capacity to collaborate effectively through teacher networks to develop educational materials and share knowledge.

– *Ability to use various security mechanisms and software to protect personal content.*

According to the feedback received from primary school teachers, there is a diversity in the methods employed for personal content protection. The majority of teachers (54%) are already familiar with safeguarding personal documents through the use of passwords. Additionally, 26% of teachers possess knowledge about advanced protection measures such as diligently securing personal files with strong passwords, employing encryption techniques, and regularly updating software. However, there are still a small number of teachers (2%) who stated that they do not store personal data electronically and therefore do not implement any security measures for their personal content. Furthermore, one teacher (1%) expressed the inability to apply security mechanisms or software to protect their personal content.

- *The ability to review measures, when, and why of using digital technologies to ensure they are used effectively.*

Most teachers (57%) reported utilizing digital technology to systematically enhance the teaching process. This encompasses the use of teaching software, e-learning platforms, or mobile applications to foster increased interaction and provide students with abundant learning materials. A smaller percentage of teachers (13%) stated that they employ digital technology to implement innovative pedagogical strategies, aiming to introduce novel and effective teaching approaches. Additionally, 20% of teachers acknowledged leveraging available devices to support their teaching practices. Moreover, a portion of teachers (10%) mentioned utilizing a diverse range of pedagogical strategies in conjunction with digital technology, demonstrating their versatility in integrating various approaches to enhance the learning experience.

- *Ability to supervise student activity in an online collaborative environment.*

A significant number of teachers (35%) reported regularly monitoring and analyzing their students' online activity. This includes tracking their progress, assessing assignments and participation in discussions, and providing feedback on their performance within the online environment. Furthermore, 25% of teachers stated that they frequently intervene by offering encouraging or corrective comments.

This demonstrates the teachers' active engagement and positive interaction with students in the online environment, aimed at fostering student development and enhancing their performance. However, while 28% of teachers expressed their respect for students' creativity and refrain from excessively monitoring or interfering in their online activity, there is a portion (12%) of teachers who do not utilize digital environments with their students. As a result, there is no monitoring of student activity within this context.

- The ability to provide opportunities for students to use digital technology to create and record data during group discussions.

A small percentage of teachers (3%) do not organize students to work in groups and therefore do not incorporate digital technology in this context. Additionally, 5% of teachers expressed that integrating digital technology into group work was not feasible. On the other hand, more than half of the teachers (57%) who scored average in their practices actively encouraged students to collaborate in teams and utilize digital technology for online information search and digital presentations. Furthermore, 20% of teachers demonstrated a commendable level of implementation by effectively organizing students to work in groups, encouraging internet usage, and facilitating digital presentation of their work. At an exemplary level, 15% of teachers structured opportunities for students to collaborate and construct knowledge collectively in an online collaborative space that allows for progress tracking.

- Ability to use digital technology to develop active teaching methods.

A significant majority of primary school teachers in the northern mountainous region of Vietnam (67%) have incorporated digital resources into their teaching practices. These resources encompass videos, animations, quizzes, and interactive materials. The integration of such resources contributes to the creation of a positive and engaging learning environment, fostering student interaction and participation. Furthermore, 13% of teachers reported frequently organizing students to work with digital technology throughout the learning process. This entails the utilization of computers, mobile devices, and applications, enabling students to access diverse information and learning materials. Moreover, an additional 12% of teachers stated that their students possess the ability to systematically employ digital technology for learning, discussion, and knowledge creation. This highlights the students' proficiency and competence in effectively utilizing digital tools and resources. However, a small proportion of teachers (8%) acknowledged actively engaging students without incorporating digital technology into the teaching process.

- Ability to establish learning activities related to the creation of digital content.

A notable percentage of teachers (35%) possess the ability to design learning activities that necessitate students to create digital content. Additionally, 31% of teachers consider student-led digital content creation as an essential component of the learning process. Furthermore, a portion of teachers (23%) offer the option for students to engage in voluntary and optional digital content creation. However, a small proportion of teachers (8%) rated this activity as challenging to implement with their students. Additionally, approximately 3% of teachers expressed the belief that establishing activities centered

around digital content creation is not feasible within their classrooms or work environment.

- The ability to use digital technology to organize students to plan, document and self-monitor their learning.

A notable percentage of teachers (15%) demonstrate a high level of proficiency in systematically integrating diverse digital resources to facilitate student planning. A substantial proportion of teachers (42%) have embraced various digital technologies to support students in their planning, documentation, and reflection on their learning journey. Furthermore, 27% of teachers occasionally employ online assessments to gauge their students' learning progress. Additionally, 13% of teachers possess awareness regarding the role of digital technology in enhancing student learning processes, yet they do not actively incorporate digital tools into their teaching practices. Lastly, a small percentage of teachers (3%) believe that utilizing digital technology for student planning, recording, and monitoring their learning is not feasible within the school context.

- The ability to use digital assessment technologies or tests and games to check student progress and give effective feedback.

Based on the survey findings, it was observed that 18% of teachers demonstrated a commendable level of competence by systematically integrating multiple digital technologies to monitor student progress. A significant proportion (35%) of teachers utilized a diverse range of digital technologies for tracking student progress. Moreover, 31% of intermediate teachers reported occasional usage of digital technology for monitoring student progress. However, 14% of teachers consistently monitored student progress without utilizing digital assessments or assignments. Additionally, a small percentage (2%) of teachers indicated that they did not employ any methods for tracking student progress in their work environment.

- The ability to use digital technology to give effective feedback.

A considerable percentage of high-achieving teachers (14%) consistently employ digital technology to deliver feedback to students. Furthermore, up to 40% of teachers utilize diverse digital media platforms to provide feedback. This can include commenting on student work through automated assessment software, online interfaces, or mobile applications. More than a third of teachers (36%) occasionally use digital media to provide feedback to students. In contrast, 9% of teachers regularly provide feedback to students but do not utilize digital media for this purpose. Interestingly, only 1% of teachers rarely provide feedback to students.

- The ability to review available information to identify students who need additional support.

When it comes to analyzing student information and utilizing it to provide continuous and effective support, the percentage of teachers achieving very high levels is relatively small, accounting for only 7% of teachers. These teachers systematically analyze information and employ it to support students in a consistent manner. On the other hand, 40% of teachers achieve good grades in this aspect. These teachers regularly collect data and evidence from tests, assignments, and other activities to make

informed decisions about providing support to students. This percentage is equivalent to the average percentage of teachers (41%) who review information about student activity and behavior to identify those who may require additional support. However, there is a group of teachers (10%) who solely analyze achievement and grade information to identify students who are performing poorly and need special support. This limited approach may overlook other factors that contribute to students' learning needs. Furthermore, a minimal proportion of teachers (1%) do not engage in specific tasks related to analyzing student information, potentially missing out on valuable insights for supporting their students effectively.

- The ability to create digital assignments for students that respond to problems they may encounter when using the digital format.

A significant portion of teachers (42%) demonstrate an average level of proficiency in adjusting tasks to mitigate potential issues that may arise when students engage with digital formats. Moreover, 32% of teachers achieve a satisfactory level of competence by engaging in discussions about potential obstacles that students may encounter when working on tasks with digital learning materials. Additionally, 18% of teachers exhibit a high level of ability to adjust tasks, engage in discussions to identify solutions, and employ various methods to ensure that students can successfully complete digital assignments that align with their abilities and needs. In contrast, a small percentage of teachers (8%) do not facilitate students' involvement in tasks involving digital assignments.

- The ability to use digital technology to provide students with activities appropriate to their individual level and learning needs.

A small percentage of teachers (5%) exhibit a lack of interest in personalization, preferring that all students perform the same activities without any customization. Furthermore, 29% of teachers express an interest in designing personalized learning activities for each student but have yet to utilize digital technology to implement this approach. On average, 19% of teachers successfully adapt digital activities to meet the specific needs of students with varying levels of progress or pace. At a commendable level, 29% of teachers provide distinct digital tasks for different skill groups, ensuring that each child receives relevant and engaging activities that align with their abilities. Additionally, 5% of teachers demonstrate a good level of proficiency in providing individualized digital tasks tailored to the unique learning needs of each student.

- Ability to teach students how to check if information is credible and how to identify false or fake information.

A percentage of teachers (6%) lack the ability to provide knowledge regarding the evaluation of reliable information or identifying false information or inconsistencies within the curriculum. On the other hand, 18% of teachers occasionally remind students that not all information found online can be considered reliable. Furthermore, 24% of teachers take the initiative to explain to students how to distinguish between reliable and unreliable sources of information. This includes educating students on factors such as the credibility of the source and authors, as well as teaching them to check for

inconsistencies in the information they come across. In addition, 39% of teachers engage in discussions with students on how to verify the authenticity of information. This involves instructing students to utilize additional search tools and methods, check the identity and reputation of the source, and cross-reference information from various sources before drawing conclusions. At an advanced level, 13% of teachers consistently discuss with students how information is created and how it can be distorted. This enables students to develop the skills to identify and analyze characteristics and patterns of misinformation.

- Ability to establish activities that require students to use digital media to communicate with each other or communicate with people in the community

A small percentage of teachers (4%) face challenges in setting up activities that enable students to utilize digital media for communication in their work environment. This limitation may stem from technological constraints or a lack of resources to implement such activities. Additionally, 9% of teachers only occasionally incorporate activities that necessitate students to use digital media for communication. On an average level, 20% of teachers require students to engage with digital media primarily for interacting and exchanging information with one another. At a fairly commendable level, 36% of teachers design activities that prompt students to utilize digital media for creating digital content, such as videos, presentations, or blogs. This enables students to share and present information with a broader audience. Furthermore, a significant proportion of teachers (30%) establish activities that systematically require students to utilize digital media for communication, thus helping students enhance their communication skills.

- The ability to teach students to behave safely and responsibly online.

4% of teachers are unable to implement teaching about safe and responsible behavior online. 11% of teachers inform students that they need to be careful when giving out personal information online. On average, 33% of teachers explained basic codes of conduct to act safely and responsibly in a digital environment. At a good level, 24% of teachers encourage interaction and feedback from students, enabling students to exchange ideas, ask questions and offer different perspectives regarding safe online behavior. At a good level, 28% of teachers facilitate students' practice of behaving safely and responsibly in real-life situations, encouraging students to build habits and act automatically based on learned rules.

- The ability to encourage students to use digital technology creatively to solve specific problems

A small percentage of teachers (5%) do not fulfill the task of integrating digital technology into problem-solving activities. Moreover, 8% of teachers rarely have the opportunity to implement digital problem-solving approaches in the classroom. This indicates that the integration of digital technology into teaching and problem-solving processes has not been consistently or frequently practiced. On an average level, 31% of teachers occasionally provide opportunities for students to utilize digital technology in solving specific problems. However, these opportunities may not be consistently available or may not be provided in a sufficient manner to foster the development of students' creative

and problem-solving skills in a digital environment. At a relatively commendable level, 33% of teachers often experiment with digital solutions to address arising problems. This demonstrates the proactive initiative and effort of teachers in integrating digital technology into the teaching process, thereby encouraging students to utilize technology to find solutions to specific problems. Furthermore, at a good level, 23% of teachers systematically integrate opportunities for the creative use of digital technology in problem-solving contexts. This indicates that teachers have established a specific and regular approach to encourage and guide students in utilizing digital technology creatively and effectively throughout the problem-solving process.

Based on a general rating scale according to Moreira [8]:

The results of the digital competency survey of primary teachers in northern mountainous areas of Vietnam are as follows:

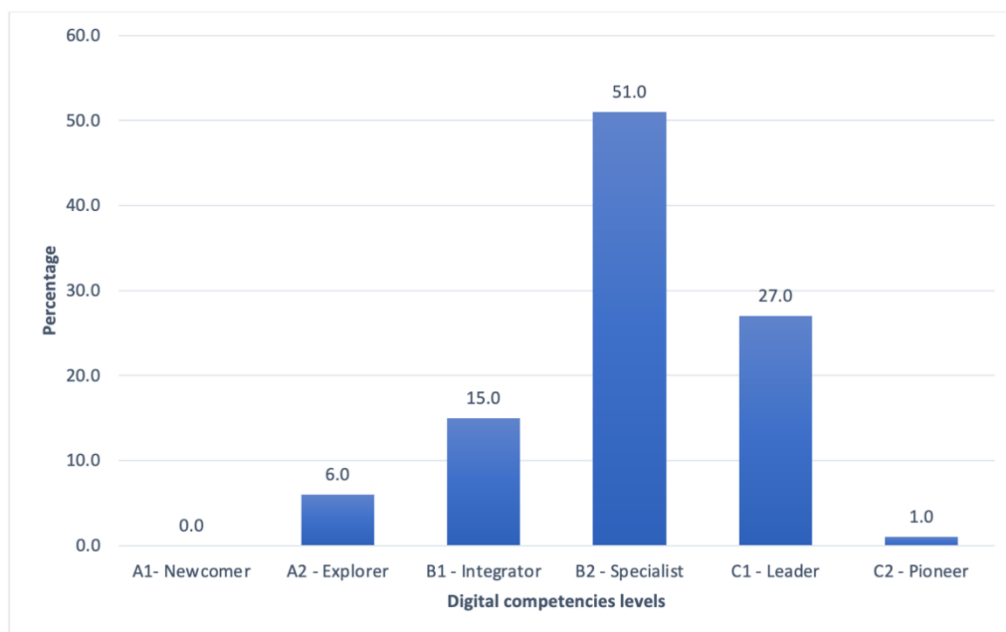


Figure 1: Digital competencies levels

Based on the survey findings, primary teachers in the northern mountainous areas of Vietnam have achieved the "Specialist" level (B2) with a rate of 51%. This indicates that a substantial number of teachers have actively integrated digital technology into their daily teaching practices and possess extensive expertise in this field. This progress signifies a significant advancement in enhancing the digital proficiency of primary teachers in the northern mountainous areas of Vietnam. Furthermore, 27% of teachers have been classified as "Leaders" (C1), indicating their leadership roles and ability to guide their colleagues in the utilization of digital technology for teaching purposes. This demonstrates the development and improved application of digital technology in education within the northern mountainous region. The third category consists of 15% of teachers who are considered "Integrators"

(B1), showcasing their ability to effectively incorporate digital technology into their teaching approaches. Additionally, 6% of teachers possess an A2 level, labeled as "Discoverers," indicating that they are still exploring and familiarizing themselves with digital technology. Lastly, only 1% of teachers are recognized as "Pioneers" (C2), making substantial contributions to the development and promotion of digital creativity in teaching. Although this percentage is relatively low, these teachers play a crucial role in setting an example and generating innovative ideas for the use of digital technology in education within the northern mountainous region. Overall, the survey results demonstrate significant progress in the digital competencies of primary teachers in the northern mountainous areas of Vietnam. While there are still teachers who require support to enhance their digital proficiency, the proportion of teachers actively integrating and utilizing digital technology in their teaching practices has significantly increased. This means that students in the northern mountainous region will have the opportunity to access and benefit from the use of digital technology in their learning process.

Consider the relationship between teachers' digital competencies and age:

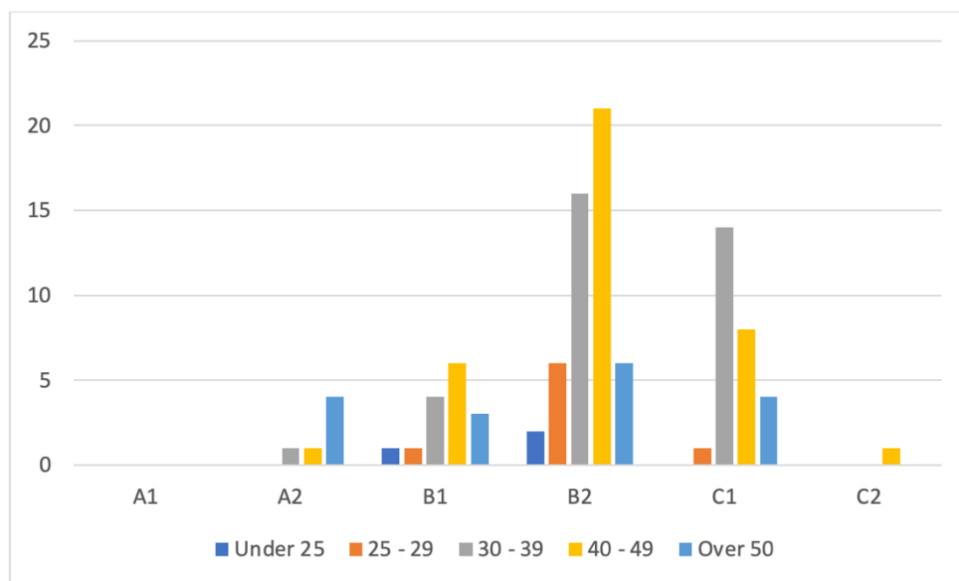


Figure 2: Relationship between teachers' digital competencies and age

At the "Explorer" level (A2), teachers over the age of 50 represent a higher proportion compared to other age groups. This observation suggests that older individuals may have relatively less advantage in terms of their ability to receive and utilize technology compared to younger individuals. For the "Integrator" level (B1), teachers of various age groups are present. The age group of 40 to 49 years old accounts for the highest percentage, followed by the age group of 30 to 39 years old. Regarding the "Specialist" level (B2), teachers between the ages of 40 and 49 continue to hold the top position. This demonstrates that this particular age group has demonstrated development and effective application of digital technology in the teaching process. At the "Leader" level (C1), the age group from 30 to 39

years old has the highest percentage. This can be explained by the fact that this age group is in their prime, recently entered maturity, and is on the verge of asserting themselves, thereby leading in terms of digital competence. The age group between 40 and 49 years old occupies the second place. Young teachers (under 25 years old) may be more hesitant and less willing to express themselves, resulting in their lower contribution to this level. Regarding the "Pioneer" level (C2), only teachers between the ages of 40 and 49 have reached this level. They are pioneers and significant contributors to the utilization of digital technology in teaching. Data analysis indicates that teachers' digital competencies vary with age. The overall trend shows an increase in the number of teachers achieving the "Integrator," "Specialist," and "Leader" levels as age increases. This reflects the progress and transformation of teachers' digital competencies over time. However, it is crucial to enhance training and support for digital competencies, particularly for teachers under the age of 30 and over the age of 50, to ensure their proficient grasp and application of digital technology in the teaching process.

Consider the relationship between teachers' digital competencies and experience:

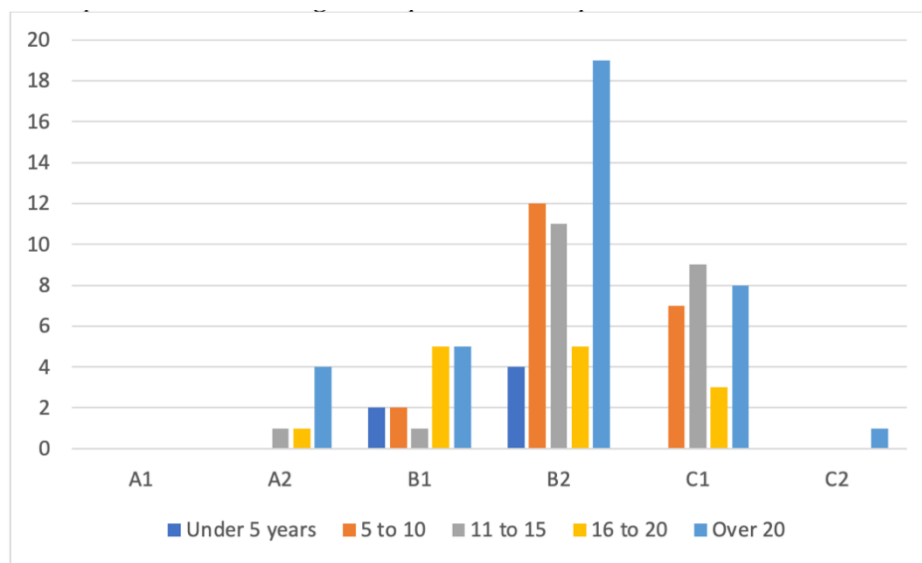


Figure 3: Relationship between teachers' digital competencies and experience

In the group of teachers with less than 5 years of experience, none are classified as "Newcomers" (A1) or "Explorers" (A2). However, there are teachers who have reached the levels of "Integrators" (B1) and "Specialists" (B2). This indicates that this particular group of early-career teachers has a foundational exploration and understanding of digital technology, and some have actively integrated it into their teaching practices. In the group of teachers with 5 to 10 years of experience, there is a significant increase in the number of teachers at the "Integrator" and "Specialist" levels. This highlights the acquisition and development of digital competencies among teachers in this mid-career group. Additionally, a number of teachers have achieved the "Leader" level (C1), demonstrating their leadership abilities and capability to guide their colleagues in the use of digital technology for teaching

purposes. For the group of teachers with 11 to 15 years of experience, there is a continued increase in the number of teachers at the "Integrator," "Specialist," and "Leader" levels. This indicates that this senior group has shown significant development and effective application of digital technology in the teaching process. In the group of teachers with 16 to 20 years of experience, the number of teachers at the "Specialist" and "Leader" levels decreases. However, there are still some teachers who have achieved the "Integrator" level. This demonstrates that despite the increase in years of experience, some teachers continue to maintain and develop their digital competencies in utilizing digital technology for teaching purposes. In the group of teachers with more than 20 years of experience, there is an increase in the number of teachers at the "Integrator," "Specialist," and "Leader" levels, with some even reaching the level of "Pioneer." This indicates that this group of experienced teachers has made progress and transformed the digital capabilities of teachers through their long-term work. Consider teachers' abilities in each area of digital competence:

- Area 1: Professional Development
- Area 2: Technology and digital resources
- Area 3: Teaching and learning
- Area 4: Assessment
- Area 5: Empowering students
- Area 6: Improving students' digital competencies

In the northern mountainous areas of Vietnam, primary school teachers demonstrate an average digital competency level above 2.45. Among the different fields, Field 2 - Technology and digital resources exhibits the highest level of proficiency. This indicates that primary teachers in these areas have responsive access to technology and find it easy to incorporate into their practice. Area 1 - Professional development comes in second place, highlighting the teachers' eagerness to learn and assert their self-worth. In contrast, Area 5 - Student empowerment ranks the lowest among the areas, suggesting the need for teachers to trust and design learning activities that empower students to be more proactive.

The main finding of this study reveals that primary school teachers in the northern mountainous regions of Vietnam possess a high level of digital competence, corresponding to the B2 Specialist level outlined in the DigCompEdu framework. The intermediate level falls between the B2 Specialist and C1 Leadership levels, demonstrating confidence, creativity, and critical thinking in integrating digital tools into pedagogical practices. However, among the core areas of digital competence according to the DigCompEdu European Framework of Reference, Area 5 - Empowering students demonstrates relatively low value and requires special attention. Similarly, Area 6 - Supporting students' digital competence also indicates areas for improvement, emphasizing the need for capacity-building activities that focus on planning and implementing tasks that encourage students to utilize digital technology to assess and manage critical information. Additionally, promoting respectful communication and collaboration in a digital environment, while respecting copyright rules when creating digital content, are key objectives. In Area 2 - Information and data literacy, concrete actions

should be developed to cultivate appropriate search strategies for identifying and selecting quality digital resources that can be adapted to the context and learning objectives. Teachers should also learn to critically evaluate the reliability and credibility of digital sources, while being aware of any usage restrictions such as copyright, file types, technical requirements, legal regulations, and accessibility. Regarding Area 4 - Assessment, it is important to promote capacity-building activities that analyze diverse assessment forms and approaches (diagnostic, formative, and summative). Furthermore, emphasis should be placed on critically evaluating evidence collected through digital technology to assess student performance and progress.

4. CONCLUSION

This paper presents an assessment of the digital competencies of primary teachers in the northern mountainous areas of Vietnam, based on survey results. The findings indicate substantial advancements in the integration of digital technology into the teaching practices of teachers in this region. Approximately 51% of teachers have achieved the "Expert" (B2) level, demonstrating their active application of digital technology in the teaching process and their deep expertise in this domain. This represents a significant stride in enhancing the digital capacity of primary school teachers in the northern mountainous areas of Vietnam. Furthermore, 27% of teachers have reached the "Leadership" (C1) level, indicating their ability to lead and guide colleagues in utilizing digital technology for teaching purposes. This signifies the development and improved application of digital technology in education within the northern mountainous region. However, there remains a small percentage of teachers at the "Integrated" (B1) and "Pioneer" (C2) levels, as well as some teachers at the "Discovery" (A2) level, who are currently in the process of exploring and learning about digital technology. This highlights the need for support and training to enhance the digital competencies of these teachers. While significant progress has been made in integrating digital technology into teaching practices, ongoing support and training are crucial to ensure that all primary school teachers in the northern mountainous region can fully harness the potential of digital technology in their teaching. Overall, the improvement in the digital capacity of primary school teachers in the northern mountainous areas of Vietnam represents a significant advancement. This development promises students in the region the opportunity to access and benefit from the use of digital technology in their learning journey. Although some teachers may require support to enhance their digital competencies, this positive trend serves as an important step towards fostering development and innovation in education within the mountainous north of Vietnam.

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