

# Innovations

## The Digital Competence of the University of Baguio Pre-service Teachers

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**Abstract:** *The information age demands competencies that respond to an increasingly digitized world. Pre-service teachers are not exempt from this imperative. This study aims to assess the digital competence of pre-service teachers of the University of Baguio across the Digital Competence (DigComp) domains and propose a training program to address identified areas of improvement. Through the descriptive quantitative design, this study assessed the DigComp levels of 68 pre-service teachers via a self-reported DigComp questionnaire. The findings indicate a moderate level of Digital Competence overall, with notable strengths observed in Safety, Information and Data Literacy, Communication and Collaboration. However, areas of improvement were identified in Digital Content Creation and Problem Solving. This study contributes to the gap in the literature on Filipino pre-service teachers' DigComp. The insights from the study served as the foundation for targeted interventions aimed at enhancing pre-service teachers' digital skills.*

**Keywords:** *Digital Competence, Pre-service Teachers, Training Program, Digital Skills, Teacher Education Institution.*

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### Introduction

Technological advancement has led to the transformation of the educational landscape, necessitating the need to develop robust digital competence for teachers. As future educators, pre-service teachers are charged with the technological know-how to integrate technology into their teaching practices effectively. This research aims to investigate the digital competence of pre-service teachers at the University and identify key areas for improvement to enhance their readiness for 21st-century classrooms.

While digital tools are necessary aids in the learning process, they might not be enough to address the needs of a 21st-century classroom. Teachers must also be armed with digital competence, or the skills needed to navigate the ever-changing technological landscape. Digital competence refers to the ability of individuals to effectively and critically use digital technologies for various purposes, including communication, collaboration, problem-solving, information management, and digital citizenship. It

encompasses the skills, knowledge, attitudes, and ethical considerations necessary to navigate and utilize digital tools in an informed and responsible manner (Carretero et al., 2017). It is also a measure of quality education in the 21st century (Fraile et al., 2018).

Learning flourishes when teachers use technology as a means to improve educational content (Ganimian et al., 2020). Today, more than ever, teachers are expected to integrate technology in the classroom as a means to enhance the teaching-learning process (Guillén-Gámez et al., 2021).

The analysis of teachers' reflections on their digital competence reveals their recognition of low-medium digital competence and a gap in certain competencies (such as evaluation of teaching practices). Hence, there is a growing need to address this concern through training programs (Basilotta-Gómez-Pablos et al., 2022). Similarly, Reisoğlu and Çebi (2020) found out that pre-service teachers need to be trained in information and digital literacy, communication and collaboration, digital content creation, safety, and problem solving.

### **Literature Review**

Pre-service teachers ought to be trained in 21st-century literacies, including digital competency (Reisoğlu & Çebi, 2020). Even if pre-service teachers today live in the era of information and technological ubiquity, studies show that there remains a gap between knowledge and implementation of the future teachers' digital competence.

Active engagement in social media and the use of technology does not translate to levels of competence in educational technology (McGarr & McDonagh, 2021). Similarly, Spanish pre-service teachers report having certain digital skills but lack the educational technological integration skills to enrich the classroom (Tarraga-Minguez et al., 2021). Some of the identified needs of Korean pre-service teachers are reflective practice and assessment strategies (Yoon, 2022).

Digital competence is perceived to be moderate among Turkish pre-service teachers, with information and data literacy, communication and collaboration, and safety as higher than content creation and problem solving (Çebi & Reisoglu, 2020). A study on the digital competence of Spanish teachers yielded a low level of digital competence, specifically in content creation and problem solving. The respondents also reported that their initial digital skills were self-taught (Fraile et al., 2018). The same trend is seen among Italian and Polish pre-service teachers, as they commonly use word processing and multimedia tools and implement them with confidence. However, sub-skills under content creation (e.g., software installation and configuration) are challenging (Tomczyk et al., 2022). Other issues include technical know-how and the digital divide in accessing an improved integration of digital technologies (Krumsvik et al., 2016). These studies point to a stronger need for training on digital competence among pre-service teachers.

There exists a gap in the research on pre-service teachers' digital competence in the Philippines. Recent studies primarily focus on the digital competence of professional teachers. For instance, the works of Javier (2022),

Alcontin (2021), and Rodriguez (2021) all explore the digital skills of teachers at the height of remote learning during the pandemic.

Nonetheless, the gap in digital competence relies on professional development and training (Alcontin, 2021). While Filipino teachers rated themselves high in their ICT skills, other dimensions of digital competence are unexplored (Rodriguez, 2021). The teachers also acknowledge the essence of digital tools in their teaching practice, despite the technical issues they encounter (Javier, 2022).

Professional and pre-service teachers the world over continue to navigate the dynamic technological tools in the teaching-learning process. Training remains to help address any gap in digital competence among pre-service teachers (Akbar & Biyanto, 2022; Maiier & Koval, 2021; Tarraga-Minguez et al., 2021).

The literature highlights the need for pre-service teachers to receive comprehensive training in DigComp. Despite living in an era of technological abundance, research reveals a persistent gap between pre-service teachers' digital knowledge and its effective use in educational contexts. Simply engaging with technology or social media does not necessarily translate into effective applications of educational technology. This is supported by the studies from various countries. Efforts to improve teacher training in digital literacy eases the means of navigating the ever-evolving technological landscape.

### **Conceptual Framework**

Recently, there have been several frameworks developed to measure digital competence. DigComp is one of the most recent, comprehensive, and valued frameworks (Cabero-Almenara et al., 2020; Çebi & Reisoglu, 2020). There are five digital competencies identified under this framework: information and data literacy, communication and collaboration, digital content creation, safety, and problem-solving (Ferrari & Punie, 2013).

The DigComp framework characterizes Information and Data Literacy (IDL) as the skill of identifying, locating, retrieving, storing, organizing, and analyzing data. It also includes determining digital data's relevance and usefulness. An information and data-literate individual can utilize technology to collaborate with others of diverse backgrounds and communicate in digital environments. Communication and Collaboration (CC) refer to the engagement of content and information through digital tools, including knowledge of and sensitivity to diversity, identity and representation, citation, and ethical standards in the publication of content. A specific skill under this competency is content production and editing (e.g., video editing). Digital Content Creation (DCC) refers to the creation of digital content across formats as a means of self-expression, remixing media while being cognizant of copyright and licensing. Other complex skills, such as programming and developing software, fall into this category. Safety covers the protection of digital identity, data security, protection, awareness of the risks associated with digital media, and safety precautions. It also underscores the impact of digital technologies on mental well-being and the environment. Problem Solving (PS) requires the ability to use digital tools to identify needs and solve

problems in digital environments and to keep abreast of recent technological advancements (Vuorikari et al., 2016, 2022).

Digital competence is found to be one of the most essential training needs for pre-service teachers today (Maiier & Koval, 2021; Tarraga-Minguez et al., 2021). It is also an essential indicator of digital literacy levels that can improve teachers' learning outcomes (Akbar & Biyanto, 2022).

### **Significance of the Study**

There is a necessity to improve the digital competence of pre-service teachers through research and training development (Basilotta-Gómez-Pablos et al., 2022; Çebi et al., 2022). Using a digital competence survey can be useful in guiding pre-service teachers in addressing gaps in the integration of technology in their teaching (McGarr & McDonagh, 2021). The digital competence checklist provided by the DigComp framework can aid in improving digital skills; this also extends to the improvement of the teaching-learning process (Maiier & Koval, 2021).

This study aims to help pre-service teachers in their educational technology training by identifying gaps in their digital competence. The training workshop, which will be the output of this study, can aid not only pre-service teachers of STELA but also their prospective learners.

### **Objectives of the Study**

This study aims to address the University's research agenda on Area III (the area of Instruction), item number four (the holistic development of students). This study can empower pre-service teachers to actively engage with digital tools and platforms. Through the training which is the output of this study, pre-service teachers can develop and enhance their technical skills, becoming proficient in using digital devices and applications.

This study also addresses SDG 2030 Number 4: Quality Education which aims to ensure inclusive and equitable quality education and promote accessible, lifelong learning opportunities. The study aligns with SDG target 4.4.1 on increasing the number of individuals with relevant skills, specifically information and communication skills, which are essential for employment and professional development in the digital era.

The general objective of this study is to determine the perceived digital competence of pre-service teachers at the University of Baguio STELA. Specifically, it aims to attain the following objectives:

- a. to identify the perceptions of pre-service teachers about their digital competence
- b. to design a training matrix for digital competence for pre-service teachers

## **Methodology**

### **Study Design**

The study used a descriptive quantitative approach to identify the perceptions of pre-service teachers about their digital competence. The results were the basis of a training matrix to be proposed to the School of Teacher Education.

### **Sample**

The study was conducted at the University Of Baguio School Of Teacher Education and Liberal Arts, and the target respondents were the third- and fourth-year pre-service teachers because they have completed courses on educational technology (EDTECA1 and EDTECA2). The population is 115 pre-service teachers. Using the Cochran formula with an 80% confidence level, the sample was computed at 68.

### **Data Gathering Tool**

The data was collected through a questionnaire based on the study of Cebi and Reisoglu (2020).

The Questionnaire is divided into five competencies, namely:

- a. Information and data literacy
- b. Communication and collaboration
- c. Digital content creation
- d. Safety
- e. Problem-solving

Before the questionnaire was administered, the tool underwent reliability through the help of a statistician. The reliability test was administered with a small group of pre-service teachers in Baguio City (n=48). This allowed the researchers to identify any potential issues such as ambiguous questions, and make necessary revisions. The reliability coefficient was computed using the Pearson-Product-Moment Correlation and the result was 0.9690 which is interpreted as excellent reliability.

### **Data Gathering Procedures**

Once the study has gone through the necessary steps for approval (ethics review and tool validation), the questionnaire was sent to the respondents' emails in Google Forms. The Form included an explanation of the instructions on Google Forms to minimize external and internal numerical data threats. The Google Forms required the users to answer all of the questions before submitting their responses. Furthermore, the form included the researchers' email addresses, should the respondents have any concerns or questions, and they can contact the researchers.

### **Treatment of Data**

The weighted mean was used to answer the first objective of the study. The Likert Scale was used in the interpretation of the results. The data was summarized and analyzed with the help of a statistician. Based on the statistical treatment, the weighted mean was used to answer the problems of the study.

**Table 1**

*The Scale of Interpretation for Digital Competence*

<b>Arbitrary Values</b>	<b>Statistical Limit</b>	<b>Descriptive Interpretation</b>	<b>Description</b>
4	3.25 – 4.00	Strongly Agree	High competence
3	2.50 – 3.24	Agree	Moderate competence
2	1.75 – 2.49	Disagree	Partial competence
1	1.00-1.74	Strongly Disagree	No competence

To address the second objective on which competencies need addressing, the results of the first objective were the basis for the creation of a training matrix on Digital Competence.

**Ethical Considerations**

Permission to administer the questionnaires was obtained from the school dean. Participation in the said endeavor was strictly voluntary, and participants reserved the right to withdraw participation or retract at any time. To ensure that the respondents' data is protected, the following measures were taken into account:

- a. The participants' information was kept private and confidential. Only the researchers have access to the results of the Google Form.
- b. Anonymity was honored. There was no other information collected apart from the ones needed in the study.

The results of the study will be disseminated to the respondents through their email accounts and research presentations and publications.

**Results and Discussion**

**The Perceived Digital Competence of University of Baguio Pre-service Teachers**

Table 2 shows insights into the pre-service teachers' digital competence across several indicators: information and data literacy, communication and collaboration, digital content creation, safety, and problem solving.

**Table 2**

*The Perceived Digital Competence of University of Baguio Pre-service Teachers*

<b>Competence Area</b>	<b>Mean</b>	<b>Descriptive Interpretation</b>	<b>Description</b>
<b>Information and Data Literacy</b>			
1. I identify my needs when searching for data, information or digital content in online environments.	3.24	Agree	Moderate Competence
2. I use information search strategies to access data, information, and digital content in online environments.	3.19	Agree	Moderate Competence
3. I critically evaluate the accuracy of the data, information or digital content I access.	3.25	Strongly Agree	High Competence
4. I access the data, information and digital content I need in online environments.	3.25	Strongly Agree	High Competence
5. I investigate from different sources whether the data, information or digital content I access is reliable.	3.24	Agree	Moderate Competence
6. I pay attention to source and citation representations when sharing data, information or digital content.	3.27	Strongly Agree	High Competence
	3.24	Agree	Moderate competence
<b>Communication and Collaboration</b>			
7. I easily organize and store data, information and content in online environments.	3.03	Agree	Moderate Competence
8. I use digital technologies to communicate in online environments.	3.36	Strongly Agree	High Competence
9. I share data, information or digital content using different digital technologies.	3.20	Agree	Moderate Competence
10. I use digital technologies to collaborate in online environments.	3.27	Strongly Agree	High Competence
11. I comply with behavioral norms (ethical rules) when interacting in online environments.	3.25	Strongly Agree	High Competence
	3.22	Agree	Moderate competence

<b>Digital Content Creation</b>			
12. I develop content in simple forms using digital technologies.	3.12	Agree	Moderate Competence
13. I can develop content in different formats (video, visual, animation, etc.) using digital technologies.	3.07	Agree	Moderate Competence
14. I pay attention to copyrights and licensing when developing digital content.	3.20	Agree	Moderate Competence
15. I produce digital content by making changes to ready-made content.	2.93	Agree	Moderate Competence
	3.08	Agree	Moderate competence
<b>Safety</b>			
16. I know what to look out for when creating a digital identity (profile) in online environments.	3.24	Agree	Moderate Competence
17. I am aware that I leave a digital footprint when I navigate online environments.	3.22	Agree	Moderate Competence
18. I am aware of the risks and threats in online environments.	3.44	Strongly Agree	High Competence
19. I take different measures to protect my digital device and content.	3.32	Strongly Agree	High Competence
20. I take precautions about safety and privacy in online environments.	3.37	Strongly Agree	High Competence
21. I protect personal data and privacy in online environments.	3.44	Strongly Agree	High Competence
22. When sharing my personal information online, I take precautions to protect the personal data of others (not to tag them in a photo without permission, etc.)	3.29	Strongly Agree	High Competence
23. I am aware of the effects of digital technology use on health (physical, psychological).	3.363	Strongly Agree	High Competence
24. I am familiar with data policies (how to use personal data) of the digital services that I am a user of (social networking, etc.).	3.14	Agree	Moderate Competence
25. I am aware of the environmental impact of using digital technologies.	3.37	Strongly Agree	High Competence
26. I know how to deal with online	3.17	Agree	Moderate



threats.			Competence
	3.31	Strongly Agree	High competence
<b>Problem Solving</b>			
27. I identify the causes of technical problems I encounter when using digital media and devices.	3.07	Agree	Moderate Competence
28. I solve the technical problems I encounter when using digital media and devices.	2.99	Agree	Moderate Competence
29. I use the different digital technologies to create innovative solutions.	3.05	Agree	Moderate Competence
30. I identify opportunities for the development of my digital competencies.	3.19	Agree	Moderate Competence
31. I develop my digital competence by following new developments.	3.29	Strongly Agree	High Competence
	3.12	Agree	Moderate competence
<b>Overall</b>	<b>3.19</b>	<b>Agree</b>	<b>Moderate competence</b>

Regarding Information and Data Literacy (IDL), the mean score of 3.24 suggests a moderate competence level among the pre-service teachers. This indicates a general comfort with handling and understanding information and data. The pre-service teachers think that they have a strong ability to critically evaluate information, access data, and pay attention to acknowledging sources when sharing information. Meanwhile, other IDL skills such as identifying needs, searching for information, and testing reliability can be seen as areas for improvement. In terms of Communication and Collaboration (CC), the mean score of 3.22 indicates a similar moderate level of competence. The pre-service teachers see themselves as highly competent in the use of technologies for online CC. They also perceive their adherence to standards of conduct in online settings to be their strongest suit. However, their competence in organizing, storing, and sharing data and information in online environments is moderate. On Digital Content Creation (DCC), the mean score of 3.08 points to a moderate level of competence. This indicates that while the pre-service teachers are confident in some DCC skills, there are opportunities for further development or improvement in this aspect. For example, they might be less confident in their ability to reproduce or edit existing digital content compared to other aspects under this competency. Safety emerges as a strong suit among pre-service teachers, with a mean score of 3.31. This suggests that the pre-service teachers feel moderately confident in navigating digital spaces safely and securely. They perceive

themselves to be competent in being aware of safety measures in online environments, protecting personal data, understanding online threats, and being cognizant of the broad impact of technology use. However, there are slight variations in competence levels across the aspect of caution in creating online profiles and awareness of digital footprint and data policies. In terms of Problem Solving (PS), the mean score of 3.12 suggests a moderate level of competence among the pre-service teachers. Although they feel comfortable with identifying causes and solving technical problems to some extent, their confidence levels vary across the different aspects of PS. There may still be areas where they can further develop their ability to effectively solve digital problems. They also show a particularly strong interest in pursuing new developments in technology.

Overall, the results suggest that the pre-service teachers at the University of Baguio generally perceive themselves as having moderate competence in various aspects of digital competence. These results agree with the findings of Çebi, et al. (2022), Tarraga-Minguez et al. (2021), Cebi and Reisoğlu (2020), Reisoğlu, and Çebi (2020), and Lopez et al. (2019) where pre-service teachers report a moderate level of Digital Competence.

Safety as a strength among pre-service teachers does not coincide with the results of other studies (e.g., Alnasib, 2023; Reisoğlu, and Çebi, 2020; Gabarda Méndez et al., 2017; López Belmonte et al., 2019), as this is reported as a weakness. Effective safety skills can be attributed to modeling from adults like teachers and parents (Fraile et al., 2018). Guidance from in-service teachers also predicted improved DigComp levels for pre-service teachers (Maiier & Koval, 2021). The respondents in the study may have had robust guidance on responsible technology use from adults and other professionals. Awareness of cyber-ethics (especially on data protection and security) may also have played a role in this competence area (McGarr & McDonagh, 2021). The respondents' confidence in Safety can be attributed to their educational technology courses (i.e., Technology for Teaching and Learning 1 and 2). These courses incorporate ICT regulations and protocols, as well as digital citizenship (Commission on Higher Education, 2017).

The competence areas of IDL and CC are identified to be strengths in this study. This result aligned with the results of Alnasib (2023), Rodríguez-García et al. (2022), Cebi and Reisoğlu (2020), Reisoğlu and Cebi (2020), Fraile et al. (2018), and Gabarda Méndez et al. (2017). These can be related to student teachers' positive attitudes towards digital technologies for communication (Štemberger & Konrad, 2021) as well as their frequent engagement with social media and digital technologies (McGarr & McDonagh, 2021). However, this result comes with a caveat as self-reported DigComp may not necessarily translate to effective applications in the classroom (Alnasib, 2023; Gudmundsdottir & Hatlevik, 2020; Štemberger & Konrad, 2021; Tarraga-Minguez et al., 2021).

Problem Solving and Digital Content Creation are competencies with the lowest means in the results. Similar to other studies on pre-service teachers' technological use in the classroom, PS and DCC can be a focus for enhancement (McGarr & McDonagh, 2021; Yang et al., 2022). Both PS and DCC competence areas are considered to be ICT-related and are essential in the learning process (Fraile et al., 2018). PS and CC skills like using ICT

knowledge to solve complex problems in the classroom and using digital technologies to support the teaching-learning process, among others are ICT standards for teachers(Commission on Higher Education, 2017).

Consistent with the results of Tomczyk and others (2022), the respondents appear to be confident in basic DCC skills like word processing and presentation tools and are less confident in editing and reproducing existing resources.

Varying levels of digital competencies are seen when gender, age, specialization, and prior knowledge of information and communications technology (ICT) are factored in (Casillas Martín et al., 2020; Çebi & Reisoglu, 2020; Hinojo-Lucena et al., 2019; Reisoğlu & Çebi, 2020; Rodríguez-García et al., 2022). While this study did not explore any of these factors, they can also be a consideration when understanding the results as well as for future studies.

**The Digital Competence Training Matrix for Pre-Service Teachers**

Table 3 describes the proposed training matrix based on the results. Specifically, it focused on addressing the areas where pre-service teachers have indicated moderate competence.

**Table 3**

*The Digital Competence Training Matrix for Pre-service Teachers*

<b>Competence Area</b>	<b>Training Topic</b>	<b>Training Objective</b>	<b>Training Method</b>
Information and Data Literacy	Information Search Strategies	To improve proficiency in using effective search strategies to access relevant data, information, and digital content online.	Hands-on tutorials
	Critical Evaluation of Information	To enhance critical evaluation of the accuracy and reliability of data, information, and digital content accessed online	Guided practice and/or mentoring
Communication and Collaboration	Organizing, Storing, and Sharing of Educational Resources	To develop skills in efficient storage, organization, and sharing of educational materials and digital content.	Interactive workshop using cloud applications
	Utilizing Digital Tools for Classroom Communication	To enhance competence in using a variety of digital tools for communication and	Demonstration sessions, role-playing activities

		collaboration in classroom settings	
Digital Content Creation	Developing Educational Content in Different Formats	To strengthen the ability to create and edit content in diverse formats such as video, visual animation, etc. using digital technologies	Software training, creative projects
	Understanding Cyberethics: Fair Use and Copyright Awareness	To increase awareness and understanding of fair use principles and copyright laws when creating and sharing educational materials	Legal seminar
Problem Solving	Troubleshooting Classroom Technology Issues	To improve skills in identifying and solving technical problems encountered when using classroom technology and digital devices	Troubleshooting sessions, scenario-based training

The training topics have been made to cater to the needs of pre-service teachers, with training objectives and methods tailored to their needs in educational contexts. The training methods emphasize practical application, hands-on practice, and collaboration to enhance their competencies effectively.

A personalized training program that addresses pre-service teachers' needs may be ideal even if they acknowledge possessing specific digital competencies. Despite their moderate DigComp levels, pre-service teachers express a deficiency in pedagogical skills necessary for effectively integrating technology into the classroom (Basilotta-Gómez-Pablos et al., 2022; Tarraga-Minguez et al., 2021). Hence, pre-service teachers' DigComp can direct how they can integrate technology in their future practice (Çebi et al., 2022).

DigComp training that employs active learning methods, like the ones identified in Table 3, can promote ICT integration in the teaching-learning process (Hoti & Shatri, 2023; Pozas & Letzel, 2023). Active learning activities involve hands-on activities facilitated by digital technologies (Koh, 2013).

Activities for Information and Digital Literacies may include selecting and evaluating information available on the internet and developing ways to use it in the classroom (Tuluk & Akyüz, 2021). These skills can be achieved through practical activities with ICT tools as well as guided support by teachers (Andreasen et al., 2022). Training with an emphasis on IDL is a

predictor of digital technology use in the classroom (Peciuliauskiene et al., 2022).

Cloud applications training can be useful for Communication and Collaboration skills such as sharing and storing files (Aburezeq & Dweikat, 2017). Pre-service teachers see collaborative digital tools and learning management systems to be helpful in the classroom (Polly et al., 2023). It is recommended that the use of CC applications be modeled by the teachers (Reisoğlu & Çebi, 2020).

Training that involves practical, hands-on training exercises using Digital Content Creation software and applications has been seen to improve pre-service teachers' DCC skills (Lee et al., 2023). Training also boosts their confidence in the use of technology in the classroom (Oakley, 2020). Tomczyk et al. (2022) noted that pre-service teachers typically turn to word processing and presentation applications and are less likely to use other DCC skills such as webpage creation, video editing, and production. However, workshops (like the use of flipped classrooms) that encourage creative outputs can be used to address this (Almutairi et al., 2020; Oakley, 2020).

Understanding cyberethics can be addressed through partnerships with other professionals, like legal experts. Professional engagement, mentoring, and collaborations for pre-service training are supported by several studies (e.g., Toharudin et al., 2023; Reisoğlu & Çebi, 2020; Tondeur et al., 2020). Cyberethics covers a wide range of considerations like copyright laws, fair use, and professional identity (Milton et al., 2021). Pre-service teachers are found to struggle with some fair use practices, such as searching for images with permissive licenses (Tomczyk et al., 2022). Cyberethics awareness for pre-service teachers is crucial since this is a period when their professional identities are shaped (Barboutidis & Stiakakis, 2023; Milton et al., 2021).

Paying attention to problem-solving strategies to address ICT integration of pre-service teachers is recommended by several studies (Barboutidis & Stiakakis, 2023; Fraile et al., 2018; Tomczyk et al., 2022). There are use cases recommended by DigComp 2.2 (Vuorikari et al., 2022) that can be employed during training that engage the PS competence area. For instance, an intermediate employment scenario requires an individual to use a MOOC (Massive Open Online Course) forum to inquire about a course and use the features of a blog or wiki to create content and collaborate with others. In this scenario, digital technology is used to aid in turning ideas into action. Addressing PS also means addressing other competence areas. In the scenario provided, CC skills are also engaged when one uses digital technologies to address problems in the digital environment.

### **Conclusion and Recommendations**

The pre-service teachers of the University of Baguio report that they have a moderate level of Digital Competence. Noteworthy strengths include their ability to evaluate information critically, use digital technologies for communication and collaboration, and maintain safety and privacy online. However, there are opportunities for improvement especially in identifying reliable sources, producing original digital content, understanding data policies, and solving technical problems.

To bolster the DigComp of the pre-service teachers, a targeted approach is recommended. The training matrix focuses on addressing specific competency gaps identified in the self-reported assessment. The topics were tailored to ensure a more effective enhancement of skills. Additionally, future studies could explore the influence of variables like gender, age, and prior ICT knowledge on Digital Competence levels. Looking at other demographic characteristics can provide further insights for refining educational strategies and interventions. This holistic approach can contribute to better preparing pre-service teachers for the demands of the digital era.

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