Assessing Digital Competence Among Pre-Service Language Teachers: Strengths and Challenges

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Abstract

This study aimed to examine the digital competence of 102 pre-service language teachers and identified areas of strength and weakness. A questionnaire aligned with the European Framework for Educators' Digital Competence (DigCompEdu) was used to assess self-perceived competence in various digital areas. The findings revealed strengths in organizational communication, professional collaboration, managing and sharing digital resources, guidance, collaborative and self-regulated learning, accessibility and inclusion, and digital content creation. However, reflective practice and analyzing evidence were identified as areas of relative weakness. The study highlighted the need for targeted training programs and curriculum enhancements to address these gaps. Enhancing the digital competence of pre-service teachers is crucial for effective integration of technology in language instruction. By addressing strengths and weaknesses, the study emphasized the importance of comprehensive digital education programs that go beyond assuming digital natives possess advanced skills. Improving digital competence among pre-service teachers can enhance the quality of language education and provide better learning experiences for students.

Key Words: digital competence; pre-service language teachers;
European Framework for Educators' Digital Competence

Introduction

Digital competence plays a crucial role in contemporary language
teaching, offering educators and learners a range of valuable
opportunities and advantages. In the digital era, language learners have
access to abundant online resources and tools that enhance their
language acquisition process. Therefore, language educators must
possess the ability to effectively navigate, critically evaluate, and utilize
digital technologies to facilitate meaningful language learning
experiences. Digital competence encompasses a broad set of skills and
knowledge required to proficiently engage with digital technologies. It
includes the ability to navigate digital platforms, evaluate online
resources, communicate effectively through digital channels, and employ
various tools for language learning purposes (Ilomäki et al., 2016).

By developing digital competence, language educators gain
access to an extensive range of multimedia resources, such as online
dictionaries, language-learning applications, interactive exercises, and
authentic language materials. These resources can enhance the quality
and diversity of instructional materials, allowing educators to create
engaging and interactive learning environments (Biletska et al., 2021;
Sancho Gil & Padilla Petry, 2016; Tammaro et al., 2018). Furthermore,
digital competence empowers language educators to foster learner
autonomy and self-directed learning. Learners can utilize digital tools and
platforms to engage in independent language practice, access

authentic language materials, and participate in online language communities (Kessler, 2018; Lavolette, 2022)

To effectively navigate and leverage digital tools and resources in teaching and learning processes, educators must possess the necessary digital competence. The European Framework for Educators' Digital Competence (DigCompEdu) provides a scientifically grounded framework that defines the digital competencies required for educators (Redecker, 2017). DigCompEdu offers a comprehensive framework for developing digital competencies specific to educators across various educational levels (pre-kindergarten, higher education, adult education, vocational training, special needs education, and non-formal learning environments). It encompasses six areas and 22 competencies, with an emphasis on the pedagogical use of digital technologies rather than solely technical skills.

Figure 1 Digital Competence for Educator Framework

The significance of digital competence in education extends beyond technical proficiency. It focuses on how educators can effectively utilize digital technologies to enhance teaching and learning

experiences. By integrating digital tools and resources, educators have the potential to transform traditional instructional practices, engage learners in interactive and collaborative activities, and facilitate personalized learning experiences. Technology integration also facilitates personalized and differentiated language instruction. Adaptive learning systems, intelligent tutoring systems, and language-learning applications can analyze learner data and provide personalized feedback and adaptive content delivery (Huu et al., 2022)

Integrating technology in education has the potential to enhance and enrich the learning experience. Digital technologies provide access to a vast array of multimedia resources, interactive simulations, and online databases, enabling learners to explore concepts and topics in a more engaging and interactive manner (Abdulrahaman et al., 2020). These resources offered opportunities for visualization, virtual experimentation, and real-time feedback, fostering deeper understanding and critical thinking skills (Hernandez-de-Menendez et al., 2020). Additionally, technology integration promotes active and collaborative learning, as students can collaborate on projects, participate in online discussions, and engage in peer-to-peer learning through digital platforms (Gunuç & Babacan, 2018; Rintaningrum, 2023).

Pre-service teachers, as future educators, play a crucial role in language education. They acquire the necessary knowledge and skills through academic coursework, including the study of linguistics, language acquisition theories, and pedagogical strategies specific to language teaching. Through field experiences and supervised teaching practicums, they develop practical teaching skills and classroom management abilities. Pre-service teachers also contribute to the improvement of

language education through their innovative ideas, fresh perspectives, and participation in research projects and professional development activities. They advocate for the importance of language education and its benefits in a globalized world (Nguyen, 2019).

In conclusion, Previous studies have highlighted the significance of digital competence in language teaching, emphasizing its potential benefits for learners and educators. However, there is a dearth of research specifically examining the digital competence level of pre-service teachers who will be responsible for implementing technology-enhanced language instruction in the future. Investigating their preparedness, knowledge, skills, and confidence in utilizing digital technologies effectively in language teaching is crucial to ensure quality language education. Understanding the specific areas of strengths and weaknesses in the digital competence of pre-service teachers can inform the development of targeted training programs, curriculum enhancements, and support systems. By addressing the gaps in digital competence, the quality of language education can be enhanced, leading to more effective language learning experiences for learners. . By identifying and addressing the gaps in the digital competence of English foreign language pre-service teachers, the quality of language education can be enhanced, leading to more effective language learning experiences for learners. Hence This study aims to determine the specific areas of strengths and weaknesses in digital competence.

Research Methodology

This study employed a descriptive quantitative research design to investigate the specific areas of strengths and weaknesses in digital

competence among 102 preservice teachers of English. The aim of the study was to determine the participants' level of digital competence and identify the specific areas in which they excelled or faced challenges. To assess the participants' digital competence, a questionnaire was utilized as the research instrument. The questionnaire was designed to align with the self-assessment of digital competency provided by the European Framework for Educators' Digital Competence (DigCompEdu). This framework served as a scientifically grounded reference for defining digital competencies among educators and provided a comprehensive set of competencies for integrating digital technologies in teaching practices (Redecker, 2017).

The self-reflection questionnaire allowed participants to rate their level of proficiency regarding specific digital competencies identified in the DigCompEdu framework. The questionnaire items covered a wide range of digital competencies, including digital skills, digital content creation, digital communication and collaboration, digital safety and well-being, and digital problem-solving. Participants rated their own level of competence in each area based on the Likert scale, indicating their perceived strengths and weaknesses.

The analysis of the questionnaire data involved a quantitative approach to identify and categorize the specific areas of strengths and weaknesses in the participants' digital competence. The responses from the self-reflection items were examined to determine the distribution of participants' ratings across the different digital competencies. The quantitative analysis involved grouping participants' responses into themes or categories based on common patterns or trends in their self-assessed digital competencies. By using self-reflection questionnaire based on the

DigCompEdu framework, this study aimed to provide insights into the specific areas where preservice teachers of English demonstrated strengths or encountered challenges in their digital competence. The findings informed teacher education programs and institutions about the strengths and weaknesses in digital competence among preservice teachers, guiding the development of targeted training programs and support mechanisms to enhance their digital skills and knowledge. Additionally, the study contributed to the broader understanding of the digital competencies required for effective integration of digital technologies in language instruction.

Findings and Discussion

Findings

To answer the research question that what kind of strength and weaknesses of pre service language teacher in digital competence?, The data provided represents the digital competence level of English pre-service teachers across different competency domains, using a scale ranging from 1 to 5. In this scale, the numerical values 1, 2, 3, 4, and 5 correspond to the levels A1, A2, B1, B2, and C1/C2, respectively, which align with the digital competence for educator Framework proficiency levels. This mapping allows for an understanding of the pre-service teachers' digital competence in relation to the digital competence for educator Framework.

	Competence	1	2	3	4	5	Ave
	Professional Engagement						3.16
A	Organisational Communication competence	3	22	21	48	8	3.35
B	Professional collaboration	9	14	28	38	13	3.31
C	Reflective practice	11	23	38	27	3	2.88
D	Digital continuous Professional Development	7	19	45	18	13	3.11
	Digital Resource						3.27

A	Selecting digital resources	2	36	28	31	5	3.01
B	Creating and modifying digital resources	18	18	19	23	24	3.17
C	Managing, protecting and sharing digital resources	5	12	37	10	38	3.63
	Teaching and Learnin						3.50
A	Teaching	4	30	21	30	17	3.25
B	Guidance	4	7	38	37	16	3.53
C	Collaborative learning	2	5	40	44	11	3.56
D	Self-regulated learning	3	10	25	43	21	3.68
	Assessment						3.19
A	Assessment strategies	5	9	43	33	12	3.37
B	Analysing evidence	6	19	50	20	7	3.03
C	Feedback and planning	1	22	46	24	9	3.18
Empowering Learner							3.52
A	Accessibility and inclusion	3	4	37	34	24	3.71
B	Differentiation personalisation	9	21	18	25	29	3.43
C	Actively engaging learners	3	10	44	29	16	3.44
Facilitating Learners' Digital Competence							3.36
A	Information and media literacy	2	27	32	31	10	3.2
B	Digital communication and collaboration	6	17	37	22	20	3.32
C	Digital content creation	5	7	39	32	19	3.52
D	Responsible use	3	25	34	24	16	3.25
E	Digital problem solving	6	12	31	27	26	3.54

Table 1 Digital Competence for Educator Framework : Pre-Service Teacher Response

When examining the data from the lower to the higher order, the reseracher observed the following trends. In the domain of **Professional Engagement**, the pre-service teachers demonstrate competencies in organizational communication and professional collaboration, with average scores of 3.35 and 3.31, respectively. However, their proficiency in reflective practice appears to be comparatively weaker, as indicated by an average score of 2.88. Moving on to **Digital Resources**, the pre-service teachers exhibit moderate competence in selecting digital resources (average score of 3.01) and creating and modifying them (average score of 3.17). However, they excel in managing, protecting,

and sharing digital resources, as evidenced by the highest average score in this domain at 3.63.

Regarding **Teaching and Learning**, the pre-service teachers display a moderate to high level of competence. They showcase proficiency in teaching (average score of 3.25), providing guidance (average score of 3.53), promoting collaborative learning (average score of 3.56), and fostering self-regulated learning (average score of 3.68). In the domain of **Assessment**, their competence is moderate, with average scores of 3.37, 3.03, and 3.18 for assessment strategies, analyzing evidence, and feedback and planning, respectively.

The data suggests that the pre-service teachers demonstrate a relatively high level of competence in **Empowering Learners**. They excel in promoting accessibility and inclusion (average score of 3.71), differentiation and personalization (average score of 3.43), and actively engaging learners (average score of 3.44). Finally, in **Facilitating Learners' Digital Competence**, their proficiency ranges from moderate to high, with average scores of 3.2, 3.32, 3.52, 3.25, and 3.54 for information and media literacy, digital communication and collaboration, digital content creation, responsible use, and digital problem-solving, respectively.

Overall, the data reveals a range of competence levels across different domains. While the pre-service teachers exhibit strength in areas such as managing digital resources, empowering learners, and certain aspects of teaching and learning, there are also areas, such as reflective practice and analyzing evidence, where their competence could be further enhanced. This information provides valuable insights into their digital competence profile and highlights areas for targeted improvement and professional development.

The numerical ratings ranging from 1 to 5 in the data provided can be understood in relation to the proficiency levels outlined in the digital competence for educator Framework. In this context, the ratings of 1, 2, 3, 4, and 5 correspond to the levels of A1, A2, B1, B2, and C1/C2, respectively. For instance, a rating of 1 signifies the lowest level of proficiency, aligning with digital competence for educator Framework level A1. As the numerical rating increases, it represents higher levels of proficiency, culminating in a rating of 5, which corresponds to level C1 or C2, signifying the highest level of language competence.

Competence	Average
Professional Engagement	3.16
Digital Resources	3.27
Teaching and Learning	3.50
Assessment	3.19
Empowering Learner	3.52
Facilitating Learners' Digital Competence	3.36

Table 2 Digital Competence for Educator Framework :
Average Pre-Service Teacher Response

Moreover, The data provided represents the average of digital competence levels of English as a foreign language pre-service teachers in various domains, arranged from the lower order to the higher order. Starting with professional engagement, which has an average score of 3.16, Next, in the domain of facilitating learners' digital competence, the pre-service teachers achieve an average score of 3.36. In the domain of digital resources, the average score increases to 3.27. Moving further, in teaching and learning, the pre-service teachers achieve an average score of 3.50, indicating a relatively high level of competence. Finally, in empowering learners, the pre-service teachers achieve the highest average score of 3.52.

Discussion

Based on the finding, the lowest average competency was **Professional Engagement**. The data reveals the competency levels of pre-service teachers in the domain of Professional Engagement, specifically in organizational communication, professional collaboration, and reflective practice. The pre-service teachers show a reasonable level of proficiency in organizational communication and professional collaboration, with average scores of 3.35 and 3.31, respectively. These findings align with previous studies (Perron et al., 2015) that indicate the significance of effective communication and collaboration skills in the field of education. However, the pre-service teachers' performance in reflective practice seems to be relatively weaker, as indicated by an average score of 2.88. This finding suggests the need for further attention and support in developing their reflective skills, as reflective practice is considered a crucial aspect of professional growth and continuous improvement in teaching (Kim et al., 2019; Mathew et al., 2017). Future research and training programs may explore strategies to enhance pre-service teachers' reflective abilities and foster a deeper understanding of its importance in their professional development.

Next, The data highlights the competence levels of pre-service teachers in the domain of **Digital Resources**, specifically in selecting, creating/modifying, and managing digital resources. The pre-service teachers demonstrate moderate proficiency in selecting digital resources (average score of 3.01) and creating/modifying them (average score of 3.17). These findings are in line with previous research (Caena & Redecker, 2019) emphasizing the importance of digital resource selection and creation in educational contexts. However, the standout performance in this domain is observed in managing, protecting, and sharing digital

resources, with the highest average score of 3.63. This indicates that the pre-service teachers possess strong skills and knowledge in effectively managing digital resources, ensuring their security and availability, and facilitating their sharing among students. This competency is crucial in the digital age, as educators need to efficiently organize and utilize digital resources to enhance teaching and learning experiences. Future studies could delve deeper into the specific strategies employed by pre-service teachers in managing digital resources to gain insights into their effective practices. Additionally, exploring ways to further enhance the competence levels in selecting and creating/modifying digital resources could contribute to strengthening overall digital pedagogy skills.

The data reveals the competence levels of pre-service teachers in the domain of **Teaching and Learning.** The findings indicate a moderate to high level of proficiency in various aspects of teaching and learning. Pre-service teachers demonstrate competence in teaching, as evidenced by an average score of 3.25. This suggests their ability to effectively deliver instruction and facilitate learning experiences for students. Moreover, the pre-service teachers exhibit proficiency in providing guidance (average score of 3.53), indicating their capability to offer support and direction to students in their learning journey. The data also reflects their competence in promoting collaborative learning (average score of 3.56), emphasizing their ability to foster collaboration among students and create an interactive learning environment. Additionally, pre-service teachers demonstrate proficiency in fostering self-regulated learning (average score of 3.68), indicating their skills in guiding students to become independent learners who take responsibility for their own learning processes. These findings align with previous research conducted by

(Darling-Hammond, L., Hyer, M.E., & Gardner, 2017) and Smith & Brown (Oates, 2019; Santosa & Iskandar, 2023), which emphasize the significance of effective teaching and the promotion of active and self-regulated learning. To further enhance their competence in teaching and learning, pre-service teachers could benefit from continued professional development programs and opportunities for reflective practice.

The data indicates that pre-service teachers exhibit a moderate level of competence in the domain of **Assessment**. The average scores of 3.37, 3.03, and 3.18 for assessment strategies, analyzing evidence, and feedback and planning, respectively, suggest a reasonable level of proficiency in these areas. This demonstrates their ability to effectively utilize digital tools and strategies to assess student learning, analyze evidence, and provide meaningful feedback for improvement. These findings are in line with previous studies conducted by Dolin et al. (2018) and Khan et al. (2017) , which highlight the importance of employing a variety of assessment strategies and utilizing digital tools to enhance the assessment process. While the pre-service teachers demonstrate competence in these areas, there is still room for further improvement. Ongoing professional development and training in assessment techniques and technologies can assist them in refining their skills and adopting innovative assessment approaches. Additionally, opportunities for collaboration and peer feedback can contribute to their growth as assessment practitioners. Overall, the moderate level of competence suggests that pre-service teachers have a foundation in assessment practices, but continuous development is crucial to ensure effective and meaningful assessment in the digital age.

The data reveals that pre-service teachers exhibit a high level of competence in the domain of **Empowering Learners**. The average scores of 3.71, 3.43, and 3.44 for promoting accessibility and inclusion, differentiation and personalization, and actively engaging learners, respectively, indicate their proficiency in creating inclusive and engaging learning environments using digital technologies. These findings align with previous research conducted by Runge et al. (2023), which emphasize the significance of empowering learners through personalized and inclusive approaches supported by digital tools. The pre-service teachers' ability to promote accessibility and inclusion demonstrates their commitment to meeting the diverse needs of learners, while their competency in differentiation and personalization reflects their capacity to tailor instruction to individual students. Furthermore, their skills in actively engaging learners highlight their ability to foster active participation, collaboration, and critical thinking among students through the integration of digital resources. While the pre-service teachers demonstrate a high level of competence in empowering learners, ongoing professional development and training can further enhance their pedagogical strategies and the effective use of digital technologies. Collaborative opportunities and sharing best practices with experienced educators can also contribute to their growth in this domain. Overall, the high level of competence exhibited by pre-service teachers in empowering learners suggests their readiness to create inclusive and engaging learning experiences that leverage digital tools to support student success.

The data highlights the pre-service teachers' competence in **facilitating learners' digital competence** across various domains. T. In the

domain of information and media literacy, the pre-service teachers demonstrate a moderate level of competence (average score of 3.2).. Furthermore, in the domain of digital communication and collaboration, the pre-service teachers exhibit a higher level of competence (average score of 3.32). This indicates their proficiency in using digital tools and platforms for effective communication, collaboration, and knowledge sharing among learners. The results are consistent with the research conducted by (Siddiq et al., 2016), highlighting the importance of digital communication skills for facilitating meaningful interactions in the digital age. In terms of digital content creation, the pre-service teachers display a relatively high level of competence (average score of 3.52). This suggests their ability to design and develop digital content that aligns with instructional objectives and engages learners in creative and interactive ways. The findings support the research conducted by (Khan et al., 2017)emphasizing the role of digital content creation in enhancing student engagement and learning outcomes. Moreover, the pre-service teachers exhibit a moderate level of competence in responsible use (average score of 3.25). This indicates their understanding of ethical and legal considerations associated with the use of digital technologies. They demonstrate responsible behavior in terms of privacy, security, and digital citizenship, which is essential for creating a safe and respectful online learning environment. This finding is consistent with the research conducted by (Marinho & Carneiro, 2018) emphasizing the importance of responsible use of digital technologies in education. Lastly, in the domain of digital problem-solving, the pre-service teachers demonstrate a high level of competence (average score of 3.54). This suggests their ability to apply critical thinking, problem-solving strategies, and digital tools to

address complex problems in various contexts. The results align with the research conducted by (Zain et al., 2022), emphasizing the role of digital problem-solving skills in fostering higher-order thinking and innovation among learners.

Conclusion

In conclusion, Pre-service teachers, as future educators, need explicit instruction and support to develop their digital competence, as being a digital native does not automatically translate into possessing the necessary pedagogical knowledge and skills. Teacher education programs should recognize the complexities of digital competence and provide opportunities for pre-service teachers to develop their digital skills and pedagogical knowledge.

Furthermore, investigating the digital competence of pre-service teachers is crucial to identify areas for improvement and inform the development of targeted training programs and support systems. Pre-service teachers showed their highest competence in creating accessible and inclusive learning environments, designing digital content, and supporting students' self-regulated learning. These areas received the highest scores, indicating pre-service teachers are proficient in using digital tools to engage learners and promote inclusive education. However, pre-service teachers need further development in reflective practice, which involves analyzing their teaching methods and making improvements.

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