frontiers | Frontiers in Education

TYPE Original Research
PUBLISHED 30 November 2023
DOI 10.3389/feduc.2023.1299059

OPEN ACCESS

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RECEIVED 22 September 2023
ACCEPTED 14 November 2023
PUBLISHED 30 November 2023

CITATION
Pegalajar Palomino MdC and Rodríguez Torres ÁF (2023) Digital literacy in university students of education degrees in Ecuador.
Front. Educ. 8:1299059.
doi: 10.3389/feduc.2023.1299059

Digital literacy in university students of education degrees in Ecuador

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Digital technologies have transformed the social and, consequently, educational context. Given this situation, it is worth highlighting the importance of promoting digital literacy to actively participate in the society in which it develops. This work analyzes the level of mastery of digital skills of the university students in Ecuador. To do this, a descriptive methodology has been used, based on the survey technique, based on a questionnaire ($n = 778$). Results reveal how the students give priority to research and information management, presenting difficulties in the development and adaptation of technological materials, as well as in the creation and adaptation of digital content. It even highlights how male university education students claim to have better digital skills, while the same situation is not the case for those others who study Intercultural Bilingual Education. This analysis enables Higher Education institutions to make decisions for planning, developing and acquiring digital skills in the university students of Education in Ecuador, in favor of better teaching professional development.

KEYWORDS

digital literacy, higher education, digital competence, initial training, university student

1 Introduction

In recent times, Information and Communication Technologies (ICT) have had a significant impact on all aspects of human activity. The process of digitization of everyday activities has accelerated, forcing citizens to adopt new strategies. We live in an era of constant technological innovation that impacts education (Urakova et al., 2023). ICTs have provided unlimited access to constantly changing information, generating infoxication. These tools have become indispensable instruments for carrying out training activities and for designing teaching strategies (Kumar and Kumar, 2018; Van de Oudeweetering and Voogt, 2018; Fuentes et al., 2019).

Learning in the digital age ranges from study to work and leisure activities. Thanks to the development of new teaching and learning tools, students acquire knowledge through the Internet. Today's young people handle digital devices (e.g., computer, laptops, mobile phones) more easily than previous generations, allowing them to develop innate competencies in the use of technologies (Amaral et al., 2019; Urakova et al., 2023).

Today's society requires citizens with digital skills to take advantage of new technologies and participate fully in economic, social and cultural life (Shopova, 2014); they enable citizens to participate in the digital transformation, benefit from lifelong learning and take advantage of employability opportunities, and are also essential to address global challenges (UNESCO, 2022). Thus, the widespread use of technological devices has led to digital literacy in current

generations and has fostered constant learning in the rest of the population (López-Belmonte et al., 2020a,b).

Digital transformation "implies a profound and accelerated innovation in activities, processes, competencies and business models. It aims to make the most of the changes and opportunities provided by digital technologies, in a strategic and prioritized manner" (Demirkan et al., 2016, p. 14). In education, digital transformation refers to learning and teaching in digital environments. This implies considering interactivity, interaction, didactics, digital tools, efficient learning, applications, digital services and mobile devices (Fernández-Enguita et al., 2023).

Digital literacy encompasses a set of essential skills in the twenty-first century. It is defined as the ability to use information technologies to search, select, evaluate, transform, and communicate information creatively (Catts and Lau, 2008; Rodríguez-Torres et al., 2018a,b). It also involves understanding and using information in various formats from multiple sources through computers, as well as performing tasks efficiently in digital environments (UNESCO, 2018). This notion incorporates conceptual, attitudinal, procedural and ethical skills that enable effective participation and communication in society, promoting gradual autonomy (Marín and Castañeda, 2021; Pacheco and Laje, 2021). Digital competence is considered one of the key competences of the teaching profession and educational quality to respond to the demands that today's society poses, coinciding with Fernández-Luque et al. (2021), and Dervenis et al. (2022).

In the 21st century, people need competencies that enable them to solve problems, construct arguments, make decisions and communicate them in a critical, creative, flexible and ethical manner through technology and media (Ferrari, 2012; Rodríguez et al., 2016; Morduchowicz, 2021). The study of digital literacy focuses on analyzing how the information housed in virtual spaces is used in specific situations and contexts to achieve explicit educational purposes (Shafirova, 2018); Therefore, more than a set of skills to know how to communicate and obtain information through electronic tools, this type of literacy is a social practice that has different meanings depending on the environment in which the person is working (George and Avello-Martínez, 2021).

For Morduchowicz (2021), training in digital competencies involves strengthening critical and creative thinking to understand how the digital environment works and to address the challenges posed by the use of the Internet. These challenges allow us to explore the meaning of privacy, identity and digital footprint; to analyze, evaluate and select information circulating on the Internet, to recognize its trustworthiness and relevance; to understand how algorithms work and how they impact daily life; to communicate in the online universe, connect and collaborate with others, interact in virtual communities and networks; to create content making efficient and empathetic use of digital language; to use the Internet for participation and problem solving.

2 Literature review

The new roles that teachers must assume in society demand training in digital competencies (Fardoun et al., 2020) and both technological and pedagogical updating (Aznar et al., 2019). This implies effectively integrating technologies in their usual professional activities, such as teaching, research, linking with society and management and administration, as well as in their personal lives (Conde, 2012; Navarro et al., 2012; Cabero-Almenara and Martínez-Gimeno, 2019), in order to support the development of digital skills in students for their life and future work (UNESCO, 2022).

Therefore, it is essential to provide teachers with training that provides them with the necessary skills to promote the use of digital technologies in the teaching-learning process (Suárez et al., 2010). This implies mastering the material provided, having a critical attitude toward the quality of the information provided to students, and using appropriate pedagogical methods and strategies to promote effective learning (Samoylenko et al., 2022; Youssef et al., 2022). On the other hand, with access to the Internet and the use of new tools for teaching and learning, the university student of Education has the opportunity to use educational technology, work in teams and develop skills such as critical thinking, creativity and communication (Youssef et al., 2022).

Digital technologies are being integrated at all levels of education, so educational institutions must review their organizational strategies and take full advantage of the potential of digital technologies and content (Kampylis et al., 2015). To achieve this goal, educational institutions must focus on improving their capacity for innovation and adapting to constantly evolving technological advances (Fernández-Enguita et al., 2023).

In addition, the impact of the COVID-19 pandemic evidenced educational disparities, especially in Latin America, where socioeconomic inequalities exacerbate digital divides in both students and teachers (Galperin, 2017; López et al., 2019; Rappoport et al., 2020). Teachers had to face emergency remote teaching (Hodges et al., 2020), which implied an abrupt transformation toward digital education, without prior planning or preparation, encountering multiple challenges, among which the lack of skill in the use of technology, difficulty in adapting digital content and lack of knowledge of digital pedagogies (Crawford et al., 2020; Bond et al., 2021).

The pandemic has been the catalyst that has forced educational institutions to develop training policies and projects that integrate ICT and work on digital competence training to guarantee the right to quality education (Cabero-Almenara et al., 2022). To democratize digitization, it is essential to ensure access to connectivity and devices (López, 2023).

Studies such as those carried out by Méndez et al. (2017), Llorente and Iglesias (2018), Escudero et al. (2019), Casillas et al. (2020), and Varela-Ordorica and Valenzuela (2020), address the analysis of digital competence in future teachers, indicating that they had an intermediate level in the development of digital competence. Moreover, Marimon-Martí et al. (2023) demonstrate a high self-perception of their teaching digital competence, valuing themselves as more competent in ethical aspects, communication and the use of resources and applications, and less trained in aspects related to pedagogical design, evaluation and use of digital technologies for learning.

In addition, several studies indicate that students entering higher education tend to overestimate their technological skills due to frequent use in their daily lives (Azad and Rashvand, 2020). However, in Shopova (2014) study, it is revealed that most young people entering university lack the essential skills to use the Internet and ICTs effectively. Despite their proficiency in the use of social networks, emails and Skype, as well as in online navigation, their competence in

the efficient application of these new technologies in the learning process is often superficial.

Fernández-Mellizo and Manzano (2018), Araiza and Pedraza (2019), Hinojo-Lucena et al. (2019), Ilina et al. (2019), and Silva et al. (2019) highlight that variables such as gender or previous ICT training can have a direct impact on the teacher's level of digital competence. Furthermore, the study by Zhou et al. (2023) points out that students' digital competence varies significantly according to gender, type of educational institution and the course in which they are enrolled.

More concretely, Pozo et al. (2020) reveal that women have a higher level of creation of digital content than men, who stand out in problem solving; furthermore, an inversely proportional relationship is observed between age and skill level. However, various studies affirm that girls and women tend to have a perception of less digital competence (Hill et al., 2010; Roig et al., 2015). For its part, Ayale and Joo (2019) have not found significant differences between genders in student teachers. Also, Paz et al. (2022) revealed that there are no significant differences in the digital competence of teachers according to their gender, although there are differences related to age, since, in general terms, the older the teacher, the lower the self-assessment of the teacher's digital skills.

To ensure quality education, it is necessary to have education professionals who combine their disciplinary knowledge with technology. This will ensure equity and quality education, enabling students to become creative, innovative and collaborative learners. They will also be able to apply what they learn to address complex societal challenges (Rodríguez, 2015; UNESCO, 2018; López et al., 2019; Fernández-Batanero et al., 2020).

3 Materials and methods

This is a quantitative, descriptive and exploratory research; it aims to examine the educational reality of a given context. In this case, it is focused on the university environment of Ecuador in relation to the self-perception of the Education student regarding literacy and the development of digital competence. The general objective of the study is to examine the digital competencies of the university student of the Bachelor's Degrees in Education; more specifically, the specific objectives are to:

- Examine the digital literacy skills of the university student of the Degrees in Education.
- Analyze whether there are statistically significant differences in the mastery of digital skills in students according to gender.
- Analyze the statistically significant differences in the development of skills and abilities related to ICT according to the degree program in which the university Education student is enrolled.

3.1 Participants

The study population consisted of university students in Ecuador ($N = 21{,}933$). This country has 60 universities and polytechnic schools, as well as 35 institutions of higher education that offer at least one degree in the area of education. Specifically, five public higher education institutions participate in this research, being the ones with the largest offer in terms of degrees related to the educational field: Central University of Ecuador, State University of Bolívar, Technical University of Ambato, Technical University of the North and University of the Armed Forces-ESPE.

For the selection of the sample, incidental sampling was used, so that those students who completed the questionnaire provided were included in the sample. Specifically, 778 university students from the Bachelor's Degrees in Education participated in the study, and the main sociodemographic characteristics of the sample under study are described in Table 1.

3.2 Instrument

The data collection instrument used is the "Questionnaire for the study of Digital Competence in Higher Education Students" (Gutiérrez et al., 2017). This takes as a reference the main technological standards analyzed by the International Society for Technology in Education for the NETS*S Project (ISTE, 2007).

It is a Likert-type scale with 10 response options; the value 1 means that the student feels completely ineffective in performing what is presented, while 10 corresponds to complete mastery of the statement.

The study presented by Gutiérrez et al. (2017) demonstrates that the internal consistency of the questionnaire is satisfactory (0.96 Cronbach's alpha), as well as a very high correlation, both for the set of items and for each dimension. For its part, the Kaiser-Meyer-Olkin (KMO) sampling adequacy index is 0.97 for the questionnaire items, which indicates correct adequacy of the data to carry out the

TABLE 1 Sociodemographic data ($N = 778$).

Variables		Percentage
Gender		
	Men	58.2
	Women	41.8
Institution		
	Central University of Ecuador	49.0
	State University of Bolivar	18.7
	Technical University of Ambato	12.6
	University of the Armed Forces-ESPE	12.2
	Technical University of the North	7.5
Degree		
	Pedagogy, Physical Activity and Sport	54.8
	Basic Education	20.1
	Pedagogy, Experimental Sciences and Informatics	16.7
	Pedagogy, Experimental Sciences, Mathematics and Physics	4.8
	Early Childhood Education	1.9
	Bilingual Intercultural Education	1.7
Work activity parallel to university studies		
	No	64.6
	Yes	35.4

Exploratory Factor Analysis. Bartlett's test of sphericity is also significant (x = 60455.720, g.l. = 946, $p < 0.0001$), which demonstrates the good fit of the model. The factorial solution is made up of six factors extracted from Varimax rotation, explaining 62.37% of the total variance; the first factor explains 41.86% of the variance; the second factor, 6.27%; the third factor, 5.38%; the fourth factor explains 3.41% of the variance; The fifth factor explains 2.76% and, finally, the sixth factor explains 2.69% of the variance. Each of these factors into which the questionnaire items are grouped is described below:

- Creativity and innovation, based on the development of creative thinking for the construction of knowledge and the development of innovative processes from ICT.
- Communication and collaboration, to support individual learning and contribute to the learning of others through digital media and environments.
- Research and information management, using digital tools.
- Critical thinking, to plan and develop projects and research, solve problems and make decisions, using appropriate digital tools and resources.
- Digital citizenship, for the practice of legal and ethical behaviors in relation to the use of ICT.
- Adequate understanding of ICT concepts, systems and operation.

3.3 Procedure and data analysis

The students participating in the research were able to complete the questionnaire through the survey technique, using the "Google Forms" application. Previously, the teachers involved in these degrees were contacted, explaining the purpose of the research and the procedure for applying the questionnaire, committing them to support the study.

Access to the sample has been intentional, so that during the period from January to August 2022, students were able to access the questionnaire, having previously read the informed consent. At all times the ethical considerations on good research practices contained in the Declaration of Helsinki were respected at all times.

Once the data had been collected, they were analyzed using the Statistical Package for Social Sciences (SPSS, version 27 for Windows). Thus, a descriptive analysis of the dimensions incorporated in the questionnaire, related to ICT competencies for university students, has been carried out, as well as an examination of the and the items in which mean and deviation scores were obtained were also examined. and standard deviation scores have been obtained.

In addition, Student's t-test for independent samples was performed to determine the existence of statistically significant differences between the dimensions of the questionnaire and the sociodemographic variable related to the student's gender. Finally, the analysis of variance (ANOVA) allowed us to examine the existence of statistically significant differences between the dimensions under study and the sociodemographic variable related to the degree in which the Education student is enrolled. The Tukey test performed *a posteriori* allowed us to verify the difference between all the pairs of means in the context of the total sample, the contrast being performed at 5%.

4 Results

4.1 Digital literacy in university education students: competencies

The descriptive analysis for each of the dimensions of the questionnaire reveals mean scores between 7.67 and 7.34 points (Table 2). For digital literacy, the dimensions in which the student revealed the highest level of competence are: the application of digital tools to obtain, evaluate and use information; the practice of legal and ethical behaviors related to ICTs; creative thinking for the construction of knowledge and the development of innovative processes using ICTs; and, finally, adequate understanding of the concepts, systems and functioning of ICTs. The two dimensions in which students have obtained lower mean scores are: the development of critical thinking skills to plan and conduct research, manage projects, solve problems and make decisions based on the use of appropriate digital tools and resources, as well as the use of digital media and environments to communicate and work collaboratively among peers.

According to the items of the questionnaire, the mean scores range between 8.52 and 6.42 points. The university education student claims to have skills to communicate with other people through the use of web-based communication tools (synchronous and asynchronous), to use different mobile devices, to use different Internet browsers, as well as skills to adapt to new situations and technological environments and to interact with other people through the use of social networks and ICT-based communication channels. To a lesser degree, the student is less proficient in designing web pages using computer programs, using collaborative work software, as well as designing or modifying a Wiki.

4.2 Digital literacy skills in students: gender differences

The analysis of means using Student's *t*-test reveals significant differences in the digital literacy skills of university students (Table 3). More specifically, these differences are seen for the competencies related to the understanding of ICT functioning and concepts [$t(775) = 5.981$; $p = 0.015$], development of skills for research and information management [$t(775) = 8.548$; $p = 0.004$] and communication and collaboration from digital media and environments [$t(775) = 7.691$; $p = 0.006$]. Moreover, the differences turn out to be more favorable for male students, who claim to have better digital skills and competencies for the development of their university studies.

4.3 Digital competencies of students: differences by degree program

ANOVA analysis reveals significant differences in some of the competencies linked to the digital literacy of the university student according to the sociodemographic variable related to the degree (Table 4). The results reveal statistically significant differences for these dimensions: "ICT functioning and concepts" [$F(5, 771) = 4.765$, $p = 0.000$]; "Research and information management" [$F(5, 771) = 2.$

TABLE 2 Descriptive analysis.

Dimensions/Items		M	SD
Technological literacy		7.57	1.44
	I am able to communicate with other people using synchronous communication tools via the Web (chat, instant messaging services, Skype, etc.)	8.52	1.57
	I am able to use different mobile devices (smartphone, Tablet, PDAs, etc.)	8.37	1.72
	I am able to communicate with other people using asynchronous communication tools via the Web (forums, social networks, mailing lists, tweets, etc.)	8.25	1.64
	I surf the Internet with different browsers (Internet Explorer, Mozilla Firefox, Safari, Opera, etc.)	8.11	1.92
	I can design web pages using a computer program, including text, images, audio, links, etc.	6.61	2.39
	Use collaborative work software using online tools such as Groupware (Google Apps, BSCW, OpenGroupWare, etc.).	6.48	2.33
Information search and processing		7.67	1.47
	I am able to locate information through different sources and databases available on the Web.	7.77	1.72
	I can identify relevant information by evaluating different sources and their provenance.	7.60	1.71
Critical thinking		7.48	1.53
	I use digital resources and tools for the exploration of current world issues and the solution of real problems, meeting personal, social, professional, etc. needs.	7.70	1.61
	I configure and solve problems related to hardware, software and network systems to optimize their use for learning and productivity.	7.09	1.93
Communication and collaboration		7.34	1.536
	I interact with other colleagues and users using social networks and ICT-based communication channels.	8.03	1.76
	I am able to design, create or modify a Wiki.	6.42	2.34
Digital citizenship		7.59	1.53
	I demonstrate personal responsibility for lifelong learning using ICTs.	7.72	1.68
	I exercise leadership for digital citizenship within my group.	7.39	1.82
Creativity and innovation		7.58	1.52
	I am able to adapt to new situations and technological environments.	8.06	1.68
	I use models and situations to explore complex systems and issues using ICTs.	7.04	1.75

TABLE 3 Student's *t*-test according to sociodemographic variable: student's gender.

Dimensions	Sig.	Man M (SD)	Female M (SD)
Technological literacy	0.015*	7.68(1.34)	7.42 (1.57)
Information search and processing	0.004*	7.71 (1.37)	7.62 (1.60)
Critical thinking	0.242	7.54 (1.49)	7.40 (1.59)
Communication and collaboration	0.006*	7.40 (1.43)	7.26 (1.66)
Digital citizenship	0.273	7.59 (1.47)	7.59 (1.61)
Creativity and innovation	0.862	7.59 (1.48)	7.57 (1.56)

364, $p = 0.038$]; "Critical thinking, problem solving and decision making" [$F(5, 771) = 3.605$, $p = 0.003$], "Digital citizenship" [$F(5,771) = 2.586$, $p = 0.025$] and "Creativity and innovation" [$F(5,771) = 2.348$, $p = 0.040$].

The Tukey test performed *a posteriori* reveals how these statistically significant differences are located, in all cases, among students enrolled in the Bachelor's Degree in Physical Activity and Sports Pedagogy, Basic Education, Experimental Sciences Pedagogy and Computer Science and Intercultural Bilingual Education. The latter have obtained worse scores in terms of mastery of digital competencies.

5 Discussion and conclusion

This work highlights the importance of strengthening teacher training regarding digital literacy. The new teaching roles require training in teaching skills (Fardoun et al., 2020), capable of promoting the use of Information and Communication Technologies in the teaching-learning process (Suárez et al., 2010). In short, it is about promoting the capacity for innovation and adaptation to technological advances in educational institutions (Fernández-Enguita et al., 2023).

Furthermore, and taking as reference the literature review carried out, this research supports what was stated in previous research by Méndez et al. (2017), Llorente and Iglesias (2018), Escudero et al. (2019), Casillas et al. (2020), and Varela-Ordorica and Valenzuela (2020) who show an intermediate level in the development of digital competence by future teachers. On the other hand, Shopova (2014) emphasizes that the university student of Education has a superficial level of ability to effectively integrate

TABLE 4 ANOVA according to sociodemographic variable: student's degree.

	1** M (SD)	2** M (SD)	3** M (SD)	4** M (SD)	5** M (SD)	6** M (SD)	ANOVA	Tukey
Technological literacy	7.60 (1.44)	7.42 (1.51)	7.91 (1.25)	7.33 (1.16)	7.34 (1.27)	6.13 (2.33)	0.000*	1,2,3-6; 2–3;
Information search and processing	7.59 (1.46)	7.83 (1.49)	7.85 (1.34)	7.81 (1.15)	7.68(1.33)	6.60 (2.66)	0.038*	2,3-6
Critical thinking	7.39 (1.58)	7.73 (1.38)	7.63 (1.39)	7.71 (1.17)	7.35 (1.43)	6.11 (2.62)	0.003*	1,2,3-6
Communication and collaboration	7.29 (1.58)	7.33 (1.49)	7.56 (1.38)	7.54 (1.30)	7.48 (1.23)	6.34 (2.54)	0.098	–
Digital citizenship	7.53 (1.56)	7.81 (1.45)	7.58 (1.43)	8.07 (1.05)	7.53 (1.37)	6.43 (2.71)	0.025*	2–6
Creativity and innovation	7.48 (1.57)	7.74 (1.46)	7.70 (1.35)	8.05 (1.06)	7.77 (1.17)	6.62 (2.57)	0.040*	1–6

*$p < 0.05$. **1, Pedagogy of Physical Activity and Sport; 2, Basic Education; 3, Pedagogy of Experimental Sciences and Computer Science; 4, Initial Education; 5, Pedagogy of Experimental Sciences, Mathematics and Physics; 6, Bilingual Intercultural Education.

ICT in the learning process, despite overestimating their technological skills due to their frequent use of these tools (Azad and Rashvand, 2020).

On the one hand, university students in the Education program give greater priority to research and information management. It is necessary that they search, access, select, organize and evaluate information to carry out work and research in all subjects and develop scientific, research and cultural competencies. These skills will help them to function in a democratic society through the responsible use of ICT.

This finding coincides with the studies carried out by Martínez-Garcés and Garcés-Fuenmayor (2020). These researchers highlight that teachers also have the ability to locate useful digital information through online libraries and repositories, identifying the most appropriate one to generate new knowledge. and classify it correctly for later reference.

On the other hand, future teachers claim to have adequate pedagogical training, but face difficulties in the development and adaptation of technological materials, as well as in the creation and adaptation of digital content. These results are in line with what was proposed by Marimon-Martí et al. (2023) who demonstrate, despite the high self-perception of teaching digital competence, less training in aspects related to pedagogical design, evaluation and the use of digital technologies for learning.

For this reason, it is crucial that Higher Education Institutions offer training processes where students learn to use digital tools and can use them in a didactic and pedagogical way in the teaching and learning process (López et al., 2019).

These findings coincide with the study by Martínez-Garcés and Garcés-Fuenmayor (2020) and indicate that there is a lack of culture in the management of copyright and in the editing of existing digital material. To achieve a better development of digital competencies, it is necessary to have skills to generate and manage digital resources, as well as resolve problems and contingencies derived from their creation and use.

Therefore, teachers demand and seek training in this regard. Furthermore, it is important to promote teacher training programs in digital skills to use emerging technologies and overcome the problems of using new technologies in the classroom, as suggested by Fombona and Pascual (2017), Colomer-Rubio et al. (2018), Prendes-Espinosa et al. (2018), and López-Belmonte et al. (2020a,b).

Furthermore, this research tries to examine certain variables that may have an impact (positive or negative) on the development of digital literacy skills of future teachers, in line with what was proposed by Araiza and Pedraza (2019), Fernández-Mellizo and Manzano (2018), Hinojo-Lucena et al. (2019), Ilina et al. (2019), Silva et al. (2019), and Zhou et al. (2023).

Regarding digital skills by gender, male university students in the Education program obtained better scores in general. However, it cannot be established that there is a significant difference between men and women, which coincides with the study carried out by Rodríguez et al. (2023). These results contradict those provided by Hill et al. (2010), Roig et al. (2015), and Pozo et al. (2020), who demonstrate the empowerment of girls and women toward the development of digital literacy skills. However, Cobos-Velasco et al. (2019) conclude that men use more technology among future professionals at the Central University of Ecuador, but this difference is not significant. Furthermore, the students of the Bilingual Intercultural Education program have obtained the worst scores in terms of mastering ICT skills, because the majority of people who study this degree come from rural communities where digital illiteracy predominates.

However, the main limitation found in the study has been the collection of data from a larger student population due to the COVID-19 pandemic, which is why it has been necessary to insist repeatedly through the university professors who collaborated in the study. Study. Furthermore, the use of the questionnaire as a self-report instrument for data collection can generate problems of social desirability and sincerity among the sample for completing and collecting data. Therefore, it may be beneficial to contrast the information collected from completing the scale by conducting interviews or holding discussion groups.

As for future lines of research, it would be advisable to carry out a study that incorporates more Higher Education institutions in the country, as well as other degrees related to the training of future teachers. Likewise, it could be positive to establish comparisons between the level of digital literacy skills between university students of Education and active teachers, who carry out their professional activity in educational centers. Furthermore, it could be examined whether variables such as the age or previous ICT training of the university student facilitate and/or impede the development of digital competence in the future student.

The prospective of this investigation is to provide data that allows Higher Education Institutions to make decisions regarding the planning, development and acquisition of digital competence in future teachers of different specialties, considering equal opportunities. and thus avoiding inequalities in the training of future teachers. Results obtained can serve as a guide for the entities and institutions in charge of teacher training and the development of

teacher training plans, as well as provide support for future scientific work that requires consulting information on the digital skills of university students. Education in a Latin American country.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by the Ethics Committee of Central University of Ecuador. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

MP: Data curation, Formal analysis, Investigation, Methodology, Software, Supervision, Validation, Writing – original draft, Writing – review & editing. ÁR: Project administration, Resources, Supervision, Visualization, Writing – original draft, Writing – review & editing.

Funding

The author(s) declare that no financial support was received for the research, authorship, and/or publication of this article.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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